

Water balance of a hybrid poplar phytocap on a reclaimed phosphogypsum stack

by

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Abstract

Phosphogypsum (PG) is a by-product of phosphorus fertilizer production and is piled into large stacks that eventually require reclamation. The first step in the reclamation process is constructing a topsoil cap to facilitate revegetation. An alternative to traditional topsoil caps underlain with synthetic liners are phytocaps, which effectively reduce deep drainage through canopy interception of rainwater, temporary water storage in the root zone, and evapotranspiration. The objective of this study was to assess the risk of deep drainage below a phytocap of fast-growing poplar trees was established on a PG stack at a former phosphorus fertilizer plant in Fort Saskatchewan, Alberta, in 2015, by measuring and modelling its water balance.

Components of the soil water balance – root zone soil water storage, precipitation, transpiration – were measured on-site with soil moisture sensors, meteorological station, soil moisture sensors and heat ratio sap flow sensor measurements scaled by leaf area. Runoff was assumed to be negligible, and surface/canopy evaporation was estimated by comparing measured changes in soil moisture storage following precipitation events during the growing season. Deep drainage below the root zone was then estimated as the value required balance with the water inputs and losses with measured changes in root zone soil water storage. Because transpiration was not measured over the entire growing season, empirical models were developed to fill in gaps in the transpiration using other meteorological variables.

Average deep drainage estimates for the 2019 and 2020 growing seasons were 10 mm and -47 mm, respectively. Based on these results, the hybrid poplar phytocap apparently minimized or eliminated deep drainage during the growing season and even offset the positive deep drainage that occurred during snowmelt in the spring of 2020 when the trees were not actively transpiring.

The clay liner at the base of the PG stack (up to 30 m below the surface) is likely key to retaining deep drainage from spring snowmelt within the stack that can be accessed by the poplars later in the growing season.

Because the water balance of only two growing seasons was measured and only one spring snowmelt recharge event, it is suggested that deep drainage risks over the long term be further informed by further measurements and/or simulation models.

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List of Abbreviations

Abbreviation	Definition
ANOVA	Analysis of variance
BD	Basal diameter
BOOST	Gradient boosted tree
CUBE	Cubist rule-based tree-based regression
D	Cumulative deep drainage below the root zone
EC	Eddy covariance
EM	Electromagnetic
ERT	Electrical resistivity tomography
E	Surface evaporation losses
ET	Evapotranspiration
ET_a	Actual evapotranspiration
ET_c	Potential crop evapotranspiration
ET_p	Potential evapotranspiration
ET_r	Reference evapotranspiration
FDD	Frost-free days
FDR	Frequency-domain reflectometry
GDD	Growing degree days
GLM	Generalized linear model
GPP	Gross primary production
GPR	Ground penetrating radar
h_m	Matric water potential
H_z	Daily average hydraulic potential
HRM	Heat ratio method
J	Corrected sap flux density
Kc	Crop coefficients
LA	Leaf area
LA_{total}	Total leaf area

LAI	Leaf area index
LM	Linear regression model
LMa	Leaf mass
LSP	Surface phenology
MARS	Multivariate adaptive regression splines
NDVI	Normalized difference vegetation index
NEP	Net ecosystem production
NORM	Naturally occurring radioactive material
P	Gauge-measured precipitation outside of canopy
PD	Pre-Dawn
PET	Potential evapotranspiration
PF	Phosphorus fertilizer
PG	Phosphogypsum
Q	Whole-tree sap flux
R	Cumulative net growing season runoff
R^2	Coefficient of determination
R^2_{adj}	Adjusted coefficient of determination
RF	Random forest
RSE	Root-mean-square error
RMSE	Root mean square error
S	Daily soil moisture storage
SA	Sapwood area
SHB	Stem heat balance
SLA	Specific leaf area
T_{avg-t}	Arithmetic average of transpiration rate per tree
THB	Trunk section heat balance
TDR	Time-domain reflectometry
T_{tree-t}	Transpiration rate per tree
T_t	Stand-level transpiration rate

VI	Vegetation index
VPD	Vapour pressure deficit
z	Gravitational potential
β	Proportion of precipitation lost to evaporative processes
Δz_i	Thickness of layer i
θ_{z_i}	Daily average volumetric moisture content at depth z_i

1. Introduction

1.1. Production of phosphogypsum and associated environmental concerns

The production of phosphorus fertilizer (PF) from phosphate rocks generates a considerable amount of phosphogypsum (PG) as a by-product. Five tons of PG is produced for every ton of phosphoric acid produced for PF (Bisone et al. 2017). The phosphorus is extracted from the phosphate rock through acid digestion using sulfuric acid at high temperatures. Although the PG is filtered and washed to reduce acid concentrations, residual phosphorus, trace elements, and hydrofluoric acid remain impurities (Bisone et al. 2017), but the main constituent is gypsum (CaSO_4).

PG tailings are stacked into "dry" or "wet" stacks. Between 10 to 20% of the world's operations use dry stacks, mainly in arid regions with freshwater scarcity. The moisture content of PG that is dry stacked ranges from 20% to 25% and requires a liner underneath the stack to prevent the leachate from dewatering (Fuleihan 2012). Even though both stacking methods require liners, wet stacking is favoured because it is more economical than dry stacks, and the resulting stacks are easier to maintain (Fuleihan 2012).

In Alberta, PG slurry is formed into large wet stacks and left to dewater. These stockpiles of PG have many operational and management costs (Bisone et al. 2017). The water within these stockpiles contains impurities such as fluorides, trace elements (e.g., Fe, Mn, Pb, and Cd), and naturally occurring radioactive materials (NORMs), which originate from the phosphate rock (el Afifi et al. 2009). These impurities are of environmental concern due to their potentially adverse effects on human health and the environment (Kumar et al. 2020). If the PG remains uncovered, it is susceptible to erosion, potentially contaminating the surrounding environment. Also, water within the PG stack can dissolve the gypsum within the stack, making it unstable (Hallin et al. 2010).

1.2. Alternative uses of phosphogypsum

While there have been numerous studies on alternatives used for PG, such as fertilizer, amendments to treat sodic soils, and building materials (Zhou et al. 2012; Bisone et al. 2017; Campos et al. 2017; Rychkov et al. 2018), the trace radioactivity and the occurrence of leachable metals represent regulatory challenges (El Afifi et al. 2009; Bisone et al. 2017). Despite these challenges, there have been investigations demonstrating the efficacy of PG for alternative uses (AMEC Earth & Environmental 2006; Zvomuya et al. 2005; Hao et al. 2005; Amrani et al. 2020).

1.3. Reclamation of phosphogypsum stacks

Dewatering the PG stacks is essential for stabilizing and reducing the risk of contaminated water being released into the surrounding environment. The dewatering process is accelerated by installing drainage pipes during wet stacking. Management of the stack water balance usually involves the establishment of a vegetated cap.

Typical vegetated caps – a 1 m soil layer topped with a vegetation cover of grasses – are often underlain by a geo-liner or a compacted clay layer. The vegetation cap requires regular maintenance, and importing 1 m of topsoil is expensive. Furthermore, the performance of traditional clay caps depreciates with time, as extreme wet and dry cycles accelerate the deterioration of compacted clay covers and geosynthetic clay liners (Kim and Owens 2010).

An alternative approach for the vegetative cap that has recently been proposed is to incorporate a 15 cm lift of topsoil into the surface of the phosphogypsum stack and plant trees in the place of grasses (Jackson et al. 2011; Nutrien 2017). Using trees or shrubs as vegetation without a liner – called phytocapping – is an alternative method to traditional, engineered caps using liners (Lamb et al. 2014; Khapre et al. 2019). Trees transpire just as much or more water than grasses, sequester carbon and can be harvested for fibre. Further, phytocapping is cost-effective, environmentally friendly and can provide additional benefits such as erosion control, landscape rehabilitation, soil quality improvement, reduced leaching of metals, and the immobilization of metals by facilitating the formation of less bioavailable species (Karaca et al. 2018). In the case of trees used in phytocapping, they can also act as bio-pumps and rain interceptors (Venkatraman and Ashwath 2016).

1.4. PG Stack Water Balance

Once stacks are dewatered, it is desirable to limit the amount of meteoric waters migrating deep into the stacks in order to maintain stack stability and reduce the risk of drainage waters carrying potential contaminants off-site. A key function of the phytocap is transpiring meteoric waters before they migrate deeper into the stack. Therefore, phytocap performance can be assessed through the measurement of the phytocap water balance.

1.4.1. Estimating transpiration

Transpiration is the process of water moving from the soil into plant roots, up the stem and out into the atmosphere through plant leaves (Jones and Tardieu, 1998). Under given conditions, different plant species will differ in their capacity to transpire, which is influenced by their physiology and anatomy. The physical structure of the water-conducting tissues (xylem, stomata, etc.) influences hydraulic resistance, root and leaf water potential, and stomatal and leaf conductance factors controlling transpiration flux. Other factors affecting transpiration are atmospheric demand (temperature, wind) as well as soil conditions (soil water potential and hydraulic conductivity). Plants have the capacity to regulate transpiration by opening and closing the stomata in response to changes in water availability (Jones and Tardieu, 1998). Methods for directly measuring transpiration measure water flow at a precise region along the soil-plant-atmosphere continuum. Modelling transpiration is accomplished by using resistance functions to simulate water flow through the soil-plant-atmosphere continuum (Kool et al., 2014).

1.4.1.1. Lysimeters

Lysimeters are instrumented rootzone monoliths that allow for the estimation of transpiration and evaporation under controlled but still realistic field conditions. More advanced weighing lysimeters allow for the measurement or estimation of all terms of the water balance (Putz et al., 2018). Early lysimeter studies did not attempt to differentiate between evaporation from the soil and transpiration from plants (Goss and Ehlers, 2009). Studies using lysimeters to quantify water loss from transpiration were covered to only have openings for the stems of plants. Drainage and evaporation were inhibited, resulting in transpiration being the main process of water loss (Goss and Ehlers, 2009).

1.4.1.2. Sap flow methods

Sap flow methods measure water flow through the stem using various thermal methods. In their review, Kool et al. (2014) summarized the thermal methods into broad categories of heat balance, heat pulse, and constant heater methods, which were implemented in seven different ways.

Heat balance methods are used to measure the water flow in the stem of a plant by using principles of energy balance accounting for heat energy applied to the stem with a heater and consequent losses measured with temperature sensors at various distances away from the heater. The two heat balance methods are trunk sector heat balance (THB) and stem heat balance (SHB) (Kool et al., 2014). The THB method was developed for large tree trunks to cover the entire sapwood depth. Multiple heater plates are inserted into the trunk in parallel (Cermák et al., 1973, 2004), and the input heat is partitioned between the heating of water flowing through the trunk, conductive heat losses, and heat that accumulated in the trunk (Trecala and Cermák, 2012). The SHB method was developed to be used on the full circumference of a segment of the stem. A flexible insulated sleeve with a heater and temperature sensors is placed around the stem (Sakuratani, 1981) (Kool et al., 2014). Grime and Sinclair looked at possible sources of error associated with using the SHB method and concluded that different errors are highly dependent on operating conditions (1999).

Heat pulse methods are used to measure sap flow velocity based on temperature response curves of plant stems following a short heat pulse from a needle-shaped heater inserted into the sapwood. The delay in time for the temperature to travel up the stem, measured with needle-shaped temperature sensors above and below the heater, is assumed to be proportional to sap flow velocity. Calibration of the probes is necessary to account for wounding to calculate volumetric sap flow rates that can be used to estimate transpiration. The probe located below (upstream from) the heat source probe can be used as a reference, if unaffected by the heater, to account for natural diurnal temperature variations in the stem, or if affected by the heater, allows for measurement of low or reverse sap flow. A reference temperature probe, unaffected by the heater, is placed below (upstream) to compensate for diurnal temperature variations and to correct for thermal conduction (Er-raki et al., 2010). Advantages of the heat pulse methods over other sap flow methods include low power requirement, as constant heating is not occurring, and simple instrumentation (Poblete-Echeverria and Ortega-Farias, 2012).

Constant-heat methods measure sap flow velocity based on temperature dissipation from a constant heating source that is inserted into the stem. Like the heat pulse method and heat balance methods, the sap flow velocity is then scaled up to determine transpiration. The method requires a probe that is heated with constant power, with temperature sensor probes inserted at variable distances away from the source probe measuring temperature (Kool et al., 2014). Sap flow velocity is determined from the temperature differences between the source and sensor probes (Kool et al., 2014).

An important limitation that applies to all heat pulse and constant-heat methods is found in scaling from sap flow to whole plant transpiration and further to stand level, as the determination of total sapwood area of the stand and mean stand sap flux are two sources of errors (Kume et al., 2010).

1.4.1.3. Chambers

Contrary to sap flow methods that require the use of empirical factors to determine transpiration, chambers allow for direct measurement of actual transpiration. However, the measurement process in chambers modifies microclimatic conditions, reducing total radiation, enhancing the proportion of diffuse radiation, and increasing both temperature and vapour pressure deficit, altering actual transpiration during measurement (Denmead et al., 1993) (Burkart et al., 2007). Static, closed or semiclosed chambers do not have any way to reduce effects on transpiration by changes in microclimatic conditions; therefore, chamber measurement should be as short as possible. On the other hand, dynamic chambers or those equipped with open gas exchange systems can continuously take measurements over days or weeks as they do not alter microclimatic conditions as much and, therefore, are more representative of atmospheric conditions outside the chamber (Kool et al., 2014) (Burkart et al., 2007).

1.4.1.4. Relationship between transpiration and dry biomass yield

Assuming that evaporation and drainage losses do not directly affect yield, the linear relationship between transpiration and dry biomass yield originally proposed by de Wit can be used to determine yield from measured, estimated, or calculated transpiration (1958) (Hanks, 1974). The same relationship can be reversed to calculate transpiration based on actual measurements of biomass accumulation (Kool et al., 2014).

1.4.1.5. Isotopic methods

Under natural conditions, the isotopic composition of water molecules can vary. Two stable hydrogen isotopes, ^1H and ^2H , account for 99.9844 % and 0.0156 % of hydrogen, respectively. Oxygen has three stable isotopes, ^{16}O , ^{17}O and ^{18}O , accounting for 99.762 %, 0.038 % and 0.200 % of oxygen, respectively. Permutations yield nine possible isotopic combinations in water molecules (Horita et al., 2008). A scenario where water entering the plant is isotopically the same as the water leaving the plant through transpiration is a permanent state of water known as the isotopic steady state (Stoy et al., 2019) (Horita et al., 2008). The existence of a permanent steady state for leaf water is still debated within the literature (Yepez et al., 2005; Lai et al., 2006), and recent studies have attempted to determine the isotopic composition of transpired and evaporated water to address the debate (Rothfuss et al., 2010).

In the process of evaporation, lighter isotopes evaporate first, leaving the heavier isotopes behind (Craig and Gordon, 1965); however, during root water uptake, the same isotopic fractionation as observed with evaporation does not occur. Assuming that a steady isotopic state is a norm, leaf water would be enriched in heavy isotopes to the same level as soil water (William et al., 2004). Therefore, since evaporation and transpiration have different isotopic compositions, their fluxes can be differentiated and partitioned within the combined process of ET (Kool et al., 2014).

1.4.1.6. Evapotranspiration partitioning measurements

As transpiration and carbon uptake in plants occur simultaneously through the stomates, there is a relation between ET and CO_2 as a function of water vapour flux (transpiration and direct evaporation) and carbon dioxide fluxes (respiration and photosynthesis) (Scanlon and Sahu, 2008). By applying flux variance similarity theory to the relationship between water vapour and carbon dioxide concentration, Scanlon and Sahu (2008) were able to quantify ET partitioning using high-frequency eddy covariance (EC) measurements.

1.4.2. Measuring soil moisture content

To quantify the water balance of a site, acquiring an accurate measurement of soil moisture is critical. Soil moisture content can provide information on the storage of water within the soil, and continuous measurements of soil moisture can aid in making inferences about water movement in

the soil. Soil moisture data can also be used for the validation of simulated soil and evapotranspiration processes within hydrological models.

Soil moisture measurement techniques can be divided into two broad categories: indirect methods and direct methods (Bittelli 2011; Dobriyal et al. 2012). The indirect method measures change in another variable caused by the amount of water in the soil and relates it back to soil moisture. The relationship between the measured variable and soil moisture is known through the use of calibration curves (Bittelli 2011).

The only direct method to measure soil moisture content is using the gravimetric method. This method is commonly used to determine soil moisture, and it provides accurate results. It is easy to use and cost-effective but is time-consuming and labour-intensive (Dobriyal et al. 2012). It involves drying soil of a known volume until large changes in mass no longer occur, resulting in no additional water leaving the sample. Soil moisture is calculated by subtracting the oven-dry soil weight from the initial field soil weight. A drawback of this method is that since soil samples are retrieved from point locations, accounting for the heterogeneity of soil moisture is difficult (Dobriyal et al. 2012), and it can potentially result in significant soil disturbance.

For the indirect methods of measuring soil moisture contents, all of the methods described in this section, except for ground penetrating radar (GPR) and electrical resistivity tomography (ERT), use sensors installed at a single point location; therefore, heterogeneity of soil moisture is challenging to account for using these tools, unless widely distributed throughout a site. If heterogeneity is important for research needs, then methods with a greater scale of measurement should be considered.

1.4.2.1. GPR

GPR uses EM waves to estimate soil moisture. This method measures the EM waves that are reflected from sub-soil features to detect variations in electrical properties. Compared to other methods that use EM waves like TDR and FDR, GPR has the potential to measure a much larger volume of soil. Therefore, measurement can be done quickly over large areas, allowing estimation of soil moisture heterogeneity in soils. There are limitations to the use of GPR. Certain soil properties, like electrical conductivity, increase the absorption and dissipation of EM energy,

reducing image quality. As well, dense portions of soil, and constituents like tree roots, are good reflectors that can potentially generate erroneous data (Dobriyal et al. 2012).

1.4.2.2. ERT

This technique uses soil resistivity to estimate soil moisture. Electrodes placed in the soil transfer current to one another, and changes in current would return soil resistivity (Bittelli 2011). An advantage of this method is that it allows for a greater depth of investigation of soil resistivity. A disadvantage of this method is that calibrating soil resistivity to soil moisture is complex as the relationship between the two is not yet well defined. As well, electrical resistivity is sensitive to some physical factors like temperature, soil solution, soil mineralogy, particle-size distribution, pore connectivity and percentage of clay (Brunet et al. 2010).

1.4.2.3. TDR and FDR

Time-domain reflectometry (TDR) is a method that allows for reliable measurements of soil water content. It is non-destructive and easily automated. TDR determines the soil moisture by measuring the velocity of the electromagnetic (EM) pulse through a probe inserted into the soil. The velocity of the EM pulse is influenced by the soil dielectric permittivity, which is influenced by the amount of water present in the soil. A greater amount of water would result in a larger dielectric permittivity which would reduce the velocity of the EM pulse (Bittelli 2011; Dobriyal et al. 2012).

Frequency-domain reflectometry (FDR) estimates soil moisture through changes in signal frequency related to the soil dielectric constant. The device relies on the reflected pulse to reach a certain voltage which differs from TDR, which uses waveform analysis instead. Using the frequency domain instead of the time domain, the method becomes sensitive to air gaps, soil salinity, temperature, bulk density and soil clay content (International Atomic Energy Agency 2008; Dobriyal et al. 2012).

1.4.2.4. Radiometric methods

The neutron probe and gamma-ray attenuation are two radiometric methods used to measure soil moisture. For the neutron probe, a neutron source emits fast neutrons, which, when colliding with atoms like hydrogen, lose energy and become slow neutrons and can be reflected toward a probe

detector (Bittelli 2011). Similar to the neutron probe, gamma ray attenuation uses gamma rays to estimate soil moisture by measuring the reflected gamma rays.

1.4.2.5. Conductivity sensors

Conductivity sensors use an alternating electrical current within a porous material to estimate soil moisture; when water within the porous material increases, the electrical conductance would also increase, which would be detected by the device (International Atomic Energy Agency 2008; Dobriyal et al. 2012).

1.4.2.6. Thermal methods

By measuring various thermal soil properties, it is possible to estimate soil moisture as it influences the thermal conductivity of the soil (Bittelli 2011). Additionally, soil heat capacity is a function of soil moisture content (He et al., 2018). Some of the most widely used methods are the soil thermal inertial method and the use of heat dissipation and heat pulse techniques. The measurements of these methods are influenced by environmental factors that add noise to the results, which can be lowered with longer acquisition periods (Antonucci et al. 2011).

1.4.3. Measuring soil water potential

In addition to indirect soil moisture content measurements, there exist several techniques that allow for indirect measurements of soil water potential. Similar to soil moisture content, soil water potential is useful in characterizing the water balance of a site.

1.4.3.1. Capacitance sensor method

Similar to TDR and FDR methods, this method uses the capacitance between electrodes; the soil dielectric permittivity is measured through the excitation of the electrodes at a specific frequency through an oscillating current. The capacitance sensor method allows for the estimation of soil matric potential instead of soil moisture (International Atomic Energy Agency, 2008).

1.4.3.2. Tensiometer

The tensiometer is a tool to measure the matric potential of the soil from the suction force exerted on the water in the tensiometer by the soil. One end of the hollow tube is fitted with a porous ceramic cup that is placed at the desired soil depth. The other end is fitted with a manometer to

read the pressure. Changes in the matric potential in the soil, caused by changes in water content, will cause changes in the water pressure within the tensiometer, measured by the manometer (Dobriyal et al. 2012). This method allows for the estimation of soil matric potential and not soil moisture, which would require forming a relationship between matric potential and soil moisture to estimate the latter (International Atomic Energy Agency, 2008).

1.4.3.3. Pressure plate method

In this method, soil water potential is controlled by pressurizing soil samples inside a sealed chamber connected to an external water reservoir at atmospheric pressure through a saturated ceramic plate. Following equilibrium, the water content of the samples is measured in order to create a relationship between soil matric potential and water content (moisture retention curve). This method is commonly used to measure field capacity and permanent wilting point. (Dobriyal et al. 2012).

1.5. Hydrological Modelling

Hydrological models can be broadly categorized as being either deterministic or stochastic. Deterministic models can be further broken down into empirical, physically based, or conceptual (i.e., hybrid) models (Abdulkareem et al., 2018).

1.5.1. Physically based models

Physically based models, also known as mechanistic models, attempt to illustrate reality mathematically using mass and energy balance equations for physical processes, such as the Richards equation for vadose zone flow, Boussinesq's equation for groundwater flow and Saint Venant equations for overland and channel routing (Abdulkareem et al. 2018). Examples of physically-based hydrological models used are HEC-HMS (USACE-HEC 2000), SWAT (Arnold et al. 2005), and MIKE SHE (Refsgaard and Storm 1995). Although the calibration of physically based models does not require a large amount of hydrological and meteorological data that are measured in both space and time, there is a large number of model parameters that need to be estimated to represent the soil and plant hydrological properties. Therefore, data like soil moisture content, initial water depth, topography, and topology, among others, are important to include as model inputs (Devia et al. 2015; Abdulkareem et al. 2018).

1.5.2. Conceptual models

Conceptual models use simplified mathematical conceptualization of a system to further refine an empirical model (Liu et al. 2017). As most conceptual models are lumped in nature, they are favoured for their simplicity and quick calculation times, in addition to having fewer problems with overparameterization. Still, there are spatially distributed conceptual models for a broader range of applications and increased spatial resolution (Tran et al. 2018), as well as hybrid approaches to conceptual models that encompasses parts of physical and empirical models (Kwon et al. 2020).

Within the most common type of conceptual hydrological models, water reservoirs are interconnected, which represents physical features of the study region that are recharged by rainfall, infiltration and percolation and that are emptied through transpiration, evaporation, runoff, drainage and deep drainage (Devia et al. 2015; Abdulkareem et al. 2018; Jaiswal et al. 2020). Internal variables, like soil moisture, are conceptualized by various response functions (Liu et al. 2017). In lumped conceptual models, the governing equations take the averaged value of model parameters to represent the entire study region (Devia et al. 2015; Abdulkareem et al. 2018; Jaiswal et al. 2020). As for the calibration of conceptual models, because of the simplicity of the models, the number of parameters to optimize is smaller than that of fully distributed models but involves curve fitting, which can make interpretation difficult (Devia et al. 2015; Jaiswal et al. 2020).

1.5.3. Empirical models

Empirical models use mathematical equations that have been evaluated from concurrent input and output data and not from the physical processes of the study site (Devia et al., 2015). Abdulkareem et al. categorized empirical models into three groups: 1) hydro informatics-based methods that use ‘transfer function models’ like neural network and evolutionary algorithms, 2) empirical hydrological methods like the unit hydrograph (Sherman 1932; Nash 1959) (Snyder 1938; Singh et al. 2014), and 3) statistically based methods, which with the aid of statistical theories, builds on functional relationships between inputs and outputs (2018).

1.6. Synthesis of Reviewed Literature

Based on the summaries in sections 1.4 and 1.5, combining soil water and transpiration measurements with the simulation of water balance in the phyto-cap can quantify the risk of deep drainage as measurements are used as a tool to describe hydraulic processes occurring in the soil. Measured values can be used as inputs for hydraulic models, such as soil moisture content to define existing soil conditions and transpiration and precipitation to represent the water loss and gain. Additionally, measured values can be used to estimate unknown hydraulic parameters needed by hydraulic models through inverse solutions (Sadeghi et al., 2019). Lastly, measured values are used to calibrate and validate hydraulic models to increase model accuracy (Ursulino et al. 2019). Therefore, to gain realistic water balance simulations, measurements are required as they assist hydraulic models in quantifying hydraulic processes such as deep drainage.

1.7. Research Objectives

The overall objective of this thesis is to assess the risk of deep drainage below the phytocap on Stack #4 at the Nutrien, Fort Saskatchewan Facility through measurement and modelling of its water balance. The specific objectives are:

1. Quantification of actual evapotranspiration and water balance of a hybrid poplar phytocap and relating ET_a to other meteorological measurements.
2. Develop, calibrate and validate models of ET_a to be used in place of labour-intensive sap flow measurements in future growing seasons.

Findings from this project would add to the reclamation goals to minimize environmental hazards, move towards closure of the PG stockpile and build on previous studies conducted on the site. The overarching reclamation goal for the PG stack would be to limit new water from entering the stockpile after it has been dewatered and percolating below the root zone and ultimately becoming unavailable for removal by tree roots. Assessing the performance of the tree phyto-cap can aid in reaching the overarching reclamation goal.

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2. Measurement of growing season actual evapotranspiration and water balance of a hybrid poplar phytocap.

2.1. Introduction

Reliable evapotranspiration (ET) estimates are important to solve problems in hydrology, agronomy, forestry, and land management (Yates 1997). Evapotranspiration can be measured with a variety of methods, such as water balance (gravimetric and soil water sensing), lysimeters, Bowen ratio, eddy covariance (EC), scintillometry, sap flow, remote sensing, and direct modeling (Allen et al. 2011). ET can be estimated in several forms, the most common being potential evapotranspiration (ET_p), which describes ET as the theoretical atmospheric evaporative demand related to the combined evaporation from the soil surface and transpiration from plants (Thornthwaite 1948; Xiang et al. 2020). There are numerous equations that can be used to estimate ET_p , such as the Penman–Monteith equation (Monteith 1965; Xiang et al. 2020). ET_p can be further scaled down to represent water-limiting environments using soil water reduction factors to estimate actual evapotranspiration (ET_a). ET_a can also be estimated by measuring all other components of the water balance equation (Chanasyk et al. 2006).

Reference evapotranspiration (ET_r) is often used interchangeably with ET_p . ET_r differs from ET_p , referring to the ET of two, well-watered reference crops; a clipped, cool-season grass or tall alfalfa (Xiang et al. 2020). A parameterized, modified version of the Penman-Monteith equation is generally used to represent ET_r (Allen et al. 1998; Xiang et al. 2020). ET_r can be further modified through the use of crop coefficients (K_c) to estimate potential crop evapotranspiration (ET_c).

There are two common, indirect methods for estimating ET_a . The first is solving the water balance equation for ET_a , and the second is scaling down the potential ET (ET_p) using soil water reduction factors (Chanasyk et al. 2006). Several studies have also attempted to estimate ET_a using quasi-direct measurements of transpiration (i.e., sap flow), interception, and runoff, which was compared

to other indirect methods for ET_a measurement like eddy covariance (Wilson et al. 2001; Ford et al. 2007; Shimizu et al. 2015). Although using measurements of sap flow from tree canopies to obtain estimates of ET_a would require additional estimates of evaporation from soil and transpiration from understory vegetation (Allen et al. 2011), many studies have shown that transpiration is the major contributor to overall ET (Tsuji-mura et al. 2007; Jasechko et al. 2013; Schlesinger and Jasechko 2014; Matheny et al. 2014; Berkelhammer et al. 2016; Sulman et al. 2016; Zhou et al. 2016), and evaporation from forest floors likely make a small contribution to ET_a (Daikoku et al. 2008). Therefore, under certain climate conditions, and in cases of closed-canopy forests with a lack of understory, using only transpiration measurements may be enough to reliably estimate ET_a .

Phytocaps use the soil as a water reservoir and ET to remove the water stored in the soil water reservoir (Hauser et al. 2005). Hence, as a primary route of water removal from the phytocap, ET has a direct influence on drainage below the root zone. Because it is difficult to directly measure drainage below the root zone, reliable estimates of ET are critical for estimating drainage (Verstraeten et al. 2008) and can be further used to evaluate the performance of phytocaps.

2.1.1. Research objectives

The overarching objective of the work presented in this chapter was to estimate ET_a of a hybrid poplar phytocap and use these measurements to estimate the deep drainage component of the soil water balance in PG stack #4 at the Nutrien, Fort Saskatchewan facility. It was assumed that sap flow sensor-measured transpiration on a number of representative trees in the plantation could be scaled to estimate the stand-level transpiration which could then be used in the soil water balance equation to estimate deep drainage during the growing season. Further to enable easier estimation of stand-level transpiration in future growing seasons, empirical models were developed to relate transpiration measurements to readily available meteorological variable and to Penman-Monteith reference evapotranspiration.

2.2. Methods

2.2.1. Site Description

Research activities were conducted on Stack #4, within the Nutrien Nitrogen Operation facility, located in Fort Saskatchewan, Alberta. A clay geo-liner was installed at the base of Stack #4 prior to its construction. Stack #4 is approximately 30 meters thick at its thickest near the center of the stack. Fort Saskatchewan is located within the Central Parkland Natural Subregion, as well as the Aspen Parkland Ecoregion and the Prairies Ecozone (Fig. 2.1). The average annual precipitation in the region is 447 mm and the annual mean temperature is 2.3 °C (Schneider 2013).

In 2016, a hybrid poplar phytocap was established on the stack - planting density, 1600 stems/ha (trees separated by ~2.5m), with no trees planted on the side slopes. The % survival of the trees on the stack was 88.9 %. Grasses occupied the side slopes of the stack and understory of the plantation except between rows where tillage was used to control the encroachment of grasses since the plantation was established (Fig. 2.1). The total area of the phytocap was 3.76 ha, with approximately 3.34 ha having full canopy closure.

2.2.2. Meteorological Measurements

Two, on-site weather stations were used to measure and record hourly climate data. Both weather stations measured rain, temperature, relative humidity, incoming solar radiation, and wind speed.

The first weather station, installed in 2008, was located roughly 300 m to the southwest of stack #4. This weather station was equipped as follows: Campbell Scientific CR 10X data logger, TE525WS Texas Electronic 0.254 mm tipping bucket rain gauge (rainfall), HPM45C Vaisala probe housed in a radiation shield (air temperature and relative humidity), Kipp & Zonen silicon pyranometer (incoming solar radiation), 05103-10 RM Young wind monitor (wind speed).

The second weather station, installed in 2019, was located on the stack in a small, grass-covered clearing within the poplar stand. This weather station was equipped as follows: HOBO U30 data logger, HOBO S-RGB-M002 tipping bucket rain gauge (rainfall), HOBO S-THB-M002 probe housed in a radiation shield (air temperature and relative humidity), HOBO S-LIB-M003 silicon pyranometer (incoming solar radiation), HOBO S-WDA-M003 wind monitor (wind speed).

Any gaps in on-site data were filled using the nearest Alberta government weather station which provided precipitation, temperature, relative humidity, incoming solar radiation, and wind speed located 14.65 km away (-113.355 degrees, 53.6466 degrees), provided by Alberta Agriculture and Forestry, Alberta Climate Information Service (ACIS 2019).

Daily, average air temperature was used to estimate growing degree days (GDD) for each growing season with a base temperature of 0 °C and frost-free days (FDD) as estimated as the number of days with average daily temperature > 0 °C in each growing season. Daily reference evapotranspiration, ET_r , was calculated using Penman-Montieth equation described in the FAO56 guidance (Allen et al. 1998).

2.2.3. Soil moisture content, soil matric potential, and soil temperature measurements

Near the second weather station on Stack #4, two nests (6 m and 68 m away) of soil temperature-moisture (Decagon/METER 5TM) and temperature-matric potential (Decagon/METER MPS-2) sensors were installed horizontally in two separate soil pits at variable depths from the surface. Soil pits were manually excavated using shovels and later repacked in the order in which the substrate material was removed. Both the 5TM and MPS-2 sensors were logged with Decagon (METER) EM50 dataloggers. Soil sensors were logged every 20 minutes. 5TM sensors were installed at depths; 5 cm, 20 cm, 40 cm, 60 cm, 100 cm, and 150 cm, while the MPS-2 sensors were only installed at depths; 5 cm, 20 cm, 40 cm and 60 cm. To ensure good contact between the MPS-2 sensors and the soil matrix, a slurry was made using substrate material found at the same depth of sensor installation and was used to coat the MPS-2 sensors prior to horizontal installation in the soil profile. Logging commenced on June 18, 2019 and ceased on September 13, 2020.

For each nest of soil sensors, the 20-min interval measurements for each sensor were averaged to estimate daily, average volumetric water content ($\bar{\theta}_z$, mm³ mm⁻³), daily average matric potential ($h_{m,z}$, cm H₂O), and daily average soil temperature ($\bar{T}_z$, °C); for each measurement depth.

Daily soil moisture storage, S (mm) for the 0-150 cm depth was estimated by summing the storage in each layer represented by the moisture sensors:

$$S = \sum_i \overline{\theta_{z_i}} \cdot \Delta z_i \quad [2-1]$$

where Δz_i is the thickness of layer i , and $\overline{\theta_{z_i}}$ is the daily average volumetric moisture content estimated with the sensor installed at depth z_i .

Daily, average hydraulic potential, H_z (cm H₂O), for each depth was calculated as the sum of matric, h_m (cm H₂O) and gravitational potentials, z (cm), using the soil surface as the reference elevation ($z=0$) with $z<0$ for depths below the soil surface:

$$H_z = h_{m,z} + z \quad [2-2]$$

Hydraulic gradients between two discrete depths were estimated as the ratio of the difference in H_z and z between the two depths.

The daily S , $h_{m,z}$, H_z from both pits were then averaged together for soil water balance calculations and time series.

2.2.4. Stand characterization, sap flow measurements and estimation of transpiration.

In the 2019 and 2020 growing seasons, 8 hybrid poplar trees (different trees in each growing season) were instrumented with heat ratio sap flow sensors (SFM1, ICT International Pty Ltd., Armidale, Australia). Efforts were made to choose trees representative of the variability of the stand. In 2019, tree height and basal diameter (BD; m) were measured on a total of 178 trees on two transects (one north-south, and one east-west). Using the transect measurements, the scale-dependent variance (Dyck and Kachanoski 2011) of tree height and BD was calculated and used to estimate the distance (scale) accounting for the majority of the variability of the stand. It was determined that a distance of 25 meters covered up to 70% of the variance in tree height and basal diameter, so 8 trees within a 25 m radius of the second weather station were selected. When selecting representative trees care was taken to exclude trees that had been girdled by rodents. During the 2019 and 2020 growing seasons, BD was measured on the instrumented trees at the start of the sap flow measurements, midway, and at the end of sap flow measurements.

Additional trees were destructively sampled during the 2019 and 2020 growing seasons to characterize leaf area, and other allometric relationships. In 2019, leaves were gathered through destructive sampling on 3 occasions. For the first 2 sampling occasions, 4 trees were felled, and, for the final sampling, the 8 trees equipped with the HRM sensors were felled. All leaves from each tree were collected and oven-dried at 70°C over 72 hours to estimate total, oven-dried tree leaf mass (L_{Ma}). The dry-mass specific leaf area (SLA, m²g⁻¹; Garnier et al. 2001) was measured on a subsample of 50 leaves from each tree. The leaf area of the subsample was measured using a LI-3100C Area Meter. Total tree leaf area (LA) was then estimated as SLA*L_{Ma}. For the 2020 sampling season, only 2 trees were felled at the end of the growing season and the ImageJ software, distributed by the Fiji platform to measure LA of the subsamples.

For each felled tree instrumented with HRM sensors from 2019 and 2020, sapwood area (SA; m²) was estimated. Sapwood area was determined using the ImageJ software, distributed by the Fiji platform (Schindelin et al. 2012; Rueden et al. 2017).

The tree measurements were used to construct the following allometric relationships: 1) SA versus BD; 2) SA versus L_{Ma}; 3) L_{Ma} versus total leaf area (SLA*total leaf mass); and 4) BD and total LA.

To account for changes to LA over the sap flow measurement periods, the BD measurements at the beginning, middle and end of sap flow measurements and the allometric relationships were used. Linear interpolation between these three LA estimates was used to estimate daily LA during sap flow measurements.

Stand leaf area index (LAI) was estimated to the stand-level by the averaged tree LA from all measured trees and multiplied by the total number of trees (n=5343) using the average BD of the measured on the trees that were instrumented with HRM sensors and those destructively sampled divided by total stand area (3.76 ha).

The heat ratio method (HRM) technique was chosen to measure sap flow as it was shown to be more capable in detecting and quantifying low flow than other sap flow techniques (Burgess et al. 2001). The sap flow sensors were made up of three needles (35 mm in length, 1.3 mm in diameter,

and 50 mm apart). The heater needle delivered a 20 J heat pulse for 2.5 s every 10 min. An upstream and downstream needs with 2 thermistors spaced 17.5 mm apart and positioned 12.5 mm (inner) and 27.5 mm (outer) from the needle base. Power to all sap flow sensors was supplied by 12 V deep cycle marine batteries which had their charge maintained with solar panels. Sap flow measurements were collected from June 19, 2019 – September 20, 2019, and from May 27, 2020 – September 12, 2020.

The mean sap flux density ($\text{cm}^3 \text{ cm}^{-2} \text{ hr}^{-1}$) between the two thermistors was calculated using the raw heat velocities of each thermistors using the Sap Flow Tool, according to the HRM and then averaged between the two thermistors and over time to get mean hourly sap flux (Burgess et al. 2001). The raw heat velocities were corrected for the wounding coefficient, using the Sap Flow Tool, which was determined through visual inspection of the tree cookies after removal of the sensors at the end of the 2019 sampling season (Marshall 1958; Burgess et al. 2001). The wounding occurred during installation of the sap flow sensors, resulting in the formation of wood does not conduct water (Barrett et al. 1995). Wound correction was implemented using a 3rd degree polynomial function that passed through the origin to correct for low, zero and reverse rates of sap flow. Pre-Dawn (PD) corrections were applied to the calculated sap flux density that was derived from the wound-corrected heat velocities (Oishi et al. 2008; Merlin et al. 2020). Among the 8 tree cookies of the 8 sampled trees from 2019, the wounding coefficients ranged between 0.24 and 0.30 cm. For the 2020 sampling season, among the 2 tree cookies sampled, the wounding coefficients ranged between 0.26 and 0.30 cm. For the other 6 trees equipped with sap flow sensors that were not samples, the wounding coefficients were set to the average (0.28 cm).

Thermal diffusivity is required to calculate sap flow. The thermal diffusivity of the fresh sapwood was calculated for all 8 trees in the 2019 season, which ranged between $2.55 \cdot 10^{-3}$ and $2.88 \cdot 10^{-3} \text{ cm}^2 \text{ s}^{-1}$. Fresh sapwood samples were collected after the removal of sap flow sensors to determine the fresh weight. The dry weight was determined after the samples were oven-dried for 72 hours at 70°C. Volume was determined using the sapwood area and the average height of the cookie measured on 4 sides. Specific heat of the dry wood matrix and of the sap were assumed constant at $1.2 \cdot 10^3 \text{ J kg}^{-1} \text{ }^\circ\text{C}^{-1}$ and $4.19 \cdot 10^3 \text{ J kg}^{-1} \text{ }^\circ\text{C}^{-1}$, respectively (Merlin et al. 2020). The 2020 sampling season used the average thermal diffusivity determined in the 2019 sampling season.

The corrected sap flux density, J ($\text{cm}^3 \text{ cm}^{-2} \text{ hr}^{-1}$), was scaled to whole-tree sap flux, Q ($\text{cm}^3 \text{ hr}^{-1}$), using the measured sapwood area, SA (cm^2) (Eq. [2-3]):

$$Q = J \times SA \quad [2-3]$$

Whole-tree sap flux for each tree, Q , was divided by the estimated leaf area of each tree, LA (m^2) to yield transpiration rate per tree, T_{tree-t} ($\text{cm}^3 \text{ H}_2\text{O m}^{-2} \text{ Leaf Area hr}^{-1}$) using the estimated leaf area of the tree, LA (m^2) (Eq. [2-4]).

$$T_{tree-t} = \frac{Q}{LA} \quad [2-4]$$

The arithmetic average of tree T_{tree-t} ($n=8$) was also calculated and is referred to as T_{avg-t} ($\text{cm}^3 \text{ H}_2\text{O m}^{-2} \text{ Leaf Area hr}^{-1}$) in the following.

Daily, stand-level T (T_t) ($\text{cm}^3 \text{ H}_2\text{O m}^{-2} \text{ Stand Area day}^{-1}$), was estimated by summing hourly T_{avg-t} estimates and scaling with LAI estimated as described above. Temporal gaps in LAI data were filled using linear interpolation.

$$T_t = T_{avg-t} \times LAI \quad [2-5a]$$

$$LAI = \frac{LA_{total}}{Total \text{ stand area}} \quad [2-5b]$$

$$LA_{total} = \sum_{i=1}^n LA_i \quad [2-5c]$$

2.2.5. Soil water balance estimation of deep drainage

Deep drainage over the sap flow measurement periods in the 2019 and 2020 growing seasons was estimated using the soil water balance equation:

$$\Delta S = P - \sum T_t - E - D - R \quad [2-6]$$

where ΔS is the change in soil water storage (mm; Eq. [2-1]), P is the gauge-measured precipitation outside of the canopy (mm), $\sum T_t$ is the cumulative stand-level transpiration (mm), E is the surface evaporation losses from precipitation interception by the poplar and understory grass canopies,

including transpiration from the understory grass canopy, D is the cumulative deep drainage below the root zone (mm), and R is the cumulative net growing season runoff (mm).

Runoff was not measured but it was assumed $R = 0$ during both growing seasons.

Surface evaporation losses, E , were estimated as follows:

$$E = \beta \cdot P \quad [2-7]$$

where P is the gauge-measured precipitation outside of the stand canopy (mm), and β is the proportion of precipitation lost to evaporative processes such as interception by the poplar and grass canopies as well as transpiration by the grass understory in the top 5-cm of soil not covered by soil moisture sensors. An optimized estimate of β was obtained by minimizing the difference between $P - E$ and ΔS for several precipitation events over both growing seasons (see Appendix A).

2.2.6. Estimation of reference evapotranspiration and stand crop coefficient, K_c

The ratio of T_t and Penman-Montieth ET_r was used to estimate a daily crop coefficient for the stand (Allen et al. 1998):

$$K_c = \frac{T_t}{ET_r} \quad [2-8]$$

where K_c is the dimensionless crop coefficient, and ET_r is the daily, reference evapotranspiration. A 4th-order polynomial was used to estimate K_c as a function of GDD (Martel et al. 2018; Alberta Agriculture and Irrigation, 2024).

2.2.7. Empirical Modelling of Transpiration

Because it was not possible to obtain sap flow measurements over the entire growing season, regression models between T and more commonly available meteorological variables were developed to help fill in measurement gaps. In addition to yielding an estimate of cumulative, stand-level T for the 2019 and 2020 growing seasons, this approach can be adapted to estimate T in the absence of sap flow measurements to further assess risk in past and future growing seasons and climate change scenarios.

As illustrated in the workflow diagram presented in Fig. 2.3, a regression model was used to predict hourly T_{avg-t} which could then be averaged over each 24 periods and scaled to daily T_t with LAI using allometric relationships as described in Section 2.2.4.

At the start and end dates of transpiration, LAI is effectively zero, making T_t zero. Therefore, methods to estimate the temporal limits of transpiration in the growing season were included as a component of the empirical modelling of transpiration to provide reasonable estimates for cumulative growing season transpiration.

In addition to the crop coefficient model (Eq. [2-6]; Allen et al. 1998), several regression models were developed to predict T_t . The R package, *tidymodels*, was used to calibrate, train, and validate the regression models used to predict hourly leaf-level transpiration, T_{avg-t} . The candidate predictor variables were the measured soil and meteorological variables - soil moisture content, soil matric potential, soil temperature, incoming solar radiation, relative humidity, air temperature, wind speed, and precipitation. Additionally, for the regression models to account for time as a variable, and use the seasonality of the variables, the cyclicity of hour, day and month was transformed into a format that regression models can understand by taking the cosine and sine of hour, day, and month. Therefore, there were a total 14 candidate predictor variables. Pearson correlation coefficients were used to estimate the degree of covariance between the candidate predictor variables.

Hourly T_{avg-t} is used as the dependent variable instead of T_t since it is normalized by leaf area, therefore variability of transpiration between years is reduced, simplifying the process of training, and testing the regression models, and thus increasing accuracy of the models.

There were 6 weeks of training data and 2 weeks of testing data. A total of 7 testing sets were generated, and not used in the calibration or training phase for each model (Appendix B). Calibration of each regression model was accomplished using cross-validation, where data is randomly selected from the training data to make up a fold. A total of 10-folds were used in calibration. In each fold, the regression model parameters using the principles of maximum entropy to form 50 sets, and the optimal parameter sets are determined through the root mean square error (RMSE) metric. A maximum entropy grid is used instead of a latin hypercube grid to minimize computational time for parameter optimization (Sacks et al. 1989; Santner et al. 1989; Dupuy et

al. 2015; Kuhn M 2020). The Gini impurity index was used to determine the importance of the independent variables in predicting the dependent variable. The importance calculates the amount of probability of a variable to be classified incorrectly when selected randomly and ranges between 0 and 1 (Nembrini et al. 2018). The 5 variables with the highest Ginni impurity index were selected to calibrate the 9 candidate models.

Root-mean-square error (RSE), coefficient of determination (R^2), adjusted R^2 (R^2_{adj}) and plots of measured versus predicted T_{avg-t} against a 1:1 line were used to compare the performance of the 9 candidate models. RSE measures the lack of fit of the model to the actual measured transpiration, while R^2 is the coefficient of determination which measures the proportion of the variance of a dependent variable that can be explained by independent variables (Rao 1973)

Three different variables - frost-free days (FFD) and growing degree days (GDD), and satellite-based surface phenology (LSP) - were used to generate three independent predictions for the state and end dates of transpiration. For FFD, the start and the end of the growing season were determined from the last spring frost and first fall frost, respectively. For GDD calculations the length of the growing season was the difference of days between the first and last points of the cumulative sigmoidal GDD curve that had the sharpest changes in slope, these points were determined using the first derivative of the cumulative GDD curve. The first and last positive value represented the first and last changepoint on the sigmoidal GDD curve, which in turn represented the start and end of the growing season respectively.

Satellite-based surface phenology (LSP) was retrieved from the PlanetScope constellation, missing data filled with the Sentinel-2 constellation, with pixel dimensions of one pixel = 3 m x 3 m for PlanetScope and one pixel = 10 m x 10 m for Sentinel-2 (Gascon et al. 2017; Planet Team 2018; Louis et al. 2019). PlanetScope imagery was automatically processed during image retrieval (atmospheric correction and clipping to study site). Sentinel-2 was retrieved and processed using the *sen2r* package in R (Ranghetti et al. 2020). Atmosphere correction in *sen2r* was completed using the *sen2cor* program, and all parameters were set to be automatically adjusted from the imagery metadata (Louis et al. 2019).

The R package *phenofit* was used to pre-process the NDVI time series, and to generate the LSP predictions – namely predictions of Greenup and Senescence stages (Kong et al. 2019, 2020; Kong

2020). The start of growing season was then estimated as the first day of Greenup and the final day of the growing season was the first day of Senescence.

Validation of LSP was completed through inter-comparisons of LSP with ground observations. Spring leaf-out ground observations were retrieved from public observations of the *Populus* genus in Alberta through PlantWatch for the years 2018, 2019, and 2020 (Beaubien and Hamann 2011; Kosmala et al. 2016). The three years coincided with available satellite data. Fall senescence was observed on site when sap flow sensors were removed for the years 2019 and 2020.

In order to compare the performance between frost-free days, growing-degree days and phenology one-way ANOVAs and Kruskal-Wallis rand sum tests were completed on the start and end dates of the methods. The two different tests were completed since the results of the Shapiro-Wilk test to determine normality may not be accurate with a low sample size of 4 years ($n = 4$).

Within the literature, vegetation indices (VI) are smoothed to reduce uncertainties as part of the pre-processing step prior to extracting the phenometric data. Additionally, the smoothing can also be used to divide growing seasons when the VI time series is comprised of multiple years. There are several methods that are used for smoothing, with logistic functions, Savitzky-Golay filter, and Gaussian functions as being the most widely used to denoise VI time series (Caparros-Santiago et al. 2021). However, in recent literature, a new method of smoothing VI time series has been proposed, which is to use the Whittaker smoother, a penalized least squares algorithm (Eilers 2003). This smoother is more robust for outliers than Savitzky-Golay and double logistics and is able to capture seasonal vegetation signals that are difficult to detect. The Whittaker smoother is used to capture the gradual vegetation signal and divide growing seasons, and then for each growing season, a double logistics is used to reconstruct daily vegetation time series (Kong et al. 2020).

To divide the growing seasons of multiple years, a Whittaker smoother was applied on the raw NDVI time series. The single parameter (λ) used in the smoother is responsible for determining the amount of smoothing applied to the time-series. The optimal λ was determined using V-curve cross-validation, which can avoid overfitting and underfitting (Frasso and Eilers 2015). Three iterations were used to determine the most unbiased division of the growing season.

After the growing seasons are determined via smoothing, the NDVI values are reconstructed as part of the pre-processing step. The reconstruction was completed using piece logistics curve fitting functions proposed by Zhang et al. (2003).

Within the literature, extracting phenometric data from remotely sensed vegetation indices (VI) is most often achieved using the threshold method (Caparros-Santiago et al. 2021). Thresholds are most often arbitrarily assigned; however, there have been studies which determined the threshold to apply by using VI ratios, which were based on the relationship between maximum and minimum VI values (White et al. 1997; Piao et al. 2006). The second most used method to extract phenometric values from NDVI time series are derivative-based methods, with the method proposed by (Zhang et al. 2003) being the most used (Caparros-Santiago et al. 2021).

2.3. Results

2.3.1. Growing Season Conditions

Site cumulative precipitation, GDD, solar radiation, ET_r , and daily average air temperature, windspeed and relative humidity for the 2019 and 2020 growing seasons (April 1 – September 30) are presented in Table 2.1. A daily time series for the meteorological variables between January 1, 2019 and December 31, 2020 is presented in Fig. 2.4. The 2019 and 2020 growing seasons were slightly wetter and cooler relative to 1991-2020, long-term averages for the nearest available weather station about 19 km from the Nutrien Fort Saskatchewan facility (Table 2.1).

The 2020 growing season was wetter and warmer than 2019. The 2019 growing season had lower precipitation, and growing degree days (GDD) compared to 2020. Additionally, 2019 had less cumulative incoming solar radiation but had higher soil temperature than 2020.

2.3.2. Allometric Relationships.

Allometric relationships between measured tree characteristics are presented in Fig. 2.5 and 2.6. The relationship between basal diameter and LA was weak ($R^2=0.28$; Fig. 2.6). Therefore, LA was determined using the allometric relationships in Fig. 2.5 using BD measured at the start middle, and end of the sap flow measurement periods in 2019 and 2020.

2.3.3. Soil water balance during sap flow measurement periods

Daily time series of P , S , T_t , K_c , LAI and measured h_m at 5-, 20-, 40- and 60-cm below the soil surface are presented in Fig. 2.7.

The large increase in S occurring in April, 2020 (Fig. 2.7A) is the result of soil thaw and infiltrating snowmelt. The initially very low S values during the first week of April 2020 (< 200 mm) are likely influenced by the presence of ice because the dielectric 5TM sensors are calibrated for soil liquid water. Soil moisture storage prior to soil freezing in November, 2019 (~ 250 mm) likely better reflect S prior to soil thaw and snowmelt in April, 2020.

Peak soil moisture storage in the 2020 growing season occurred on April 28, 2020 (~ 330 mm) after the completion of soil thaw and snowmelt, suggesting an over-winter increase in S of ~ 70 mm. Timely rainfall during May, June and July, 2020 kept S between 290 and 310 mm, significantly higher and more consistent than June and July, 2019.

The time series of h_m (Fig. 2.7F) shows that, in both growing seasons, average matric potential at the 5- and 20-cm depths correspond to daily perturbations in soil moisture storage, whereas the matric potentials at 40- and 60-cm depths are more reflective of the larger temporal trends (monthly) in soil moisture storage. This reflects the highly transient conditions in the shallower depths due to infiltration of precipitation followed by soil drying induced by transpiration and, to a lesser extent, drainage to deeper depths.

Greater leaf area and wetter, warmer conditions in 2020 are apparent in the consistently greater T_t compared to the 2019 growing season (Fig. 2.17B,D). In the 2019 and 2020 measurements periods, T_t showed an increasing trend even during steady decreases in ET_r and the slope of the GDD curves following peak daily temperatures and solar radiation in mid-July. As a result, K_c showed an overall increasing trend in the 2019 and 2020 measurement periods. Further, once K_c exceeded 1 during the 2020 period, its rate of increase was even higher, which is also reflected in the relationship between GDD and K_c , as presented in Fig. 2.8.

Depth profiles of H_z averaged over both soil pits on 7 days representing relatively high and low S for the 2019 and 2020 measurement periods are presented in Fig. 2.9, and depth profiles of hydraulic gradients are presented in Fig. 2.10. There is greater variability temporal variability in H_z and hydraulic gradients in the top two depths in 2019 compared to 2020, but less temporal variability at lower depths (Fig. 2.9 & 2.10). This observation reflects the less frequent, lower magnitude precipitation events that caused to surface soil to dry to a greater extent and infiltration to shallower depths in 2019 compared to 2020. The hydraulic gradient at 50 cm below surface (calculated with h_m at 40- and 60-cm depths) was negative (i.e., upward water flux) except for the earliest observation in 2020 (May 20; Fig. 2.10B), and exclusively negative in 2019 (Fig. 2.10A). Therefore, during the sap flow measurement periods 2019 and 2020, hydraulic gradients do not appear favorable for drainage below 60-cm.

A summary of the water balance components (Eq. [2.6]) is presented in Table 2.2. The value of β , representing the proportion of precipitation lost to canopy interception, used to estimate E in Table 2.2 was 0.6, indicating 60% of incident precipitation was lost to evaporation from the vegetation canopies and transpiration from the understory grass canopy. This estimate is based on the agreement between estimated $P - E$ ($E = \beta \cdot P$) and measured ΔS for several precipitation events during the sap flow measurement periods in 2019 and 2020, as described in Appendix A.

In the 2020 sap flow measurement period, estimated deep drainage is negative, meaning the negative change (decrease) in ΔS was observed because $\sum T_t$ and E exceeded P . Over the 2019 sap flow measurement period, drainage was positive (~ 10 mm), suggesting it may take a few years

of canopy development before growing season deep drainage fluxes are zero or negative, as observed in 2020.

2.3.4. Empirical transpiration models

A Pearson correlation matrix summarizing the covariance between the 14 candidate predictor variables is presented in Fig. 2.11. Out of the original 14 predictor variables, only the top 5 important variables were used based on the Gini impurity index, and the results are summarized in Fig. 2.12. Incoming solar radiation, relative humidity, air temperature and the hourly component of the day (sine and cosine of hour) were set as the independent variables for 9 candidate models to predict hourly, average tree-level transpiration, T_{avg-t} (Fig. 2.12). A summary of the RSE, R^2 and R^2_{adj} for all nine candidate models using the 7 training datasets is presented in Table 2.3. The regression tree models performed the best (CUBE, RF, BOOST) as they had the lowest estimated standard deviation of the errors (RSE) and the highest R^2 and adjusted R^2 . Out of all the regression tree models, the cubist rule-based tree-based regression (CUBE) model performed the best (Fig. 2.13). Linear models (LM and GLM) were less able to predict lower transpiration amounts as compared to the tree-based models (Fig. 2.13).

The best-performing CUBE model (Table 2.3) was selected to generate estimates of growing season transpiration. Although the CUBE model is accurate in predicting hourly T_{avg-t} , information about the start and end of active transpiration for the growing season is required to use the model to generate total growing season transpiration at the stand level.

Estimates of the start and end of transpiration based on FFD, GDD and LSP for the 2019 and 2020 growing seasons are presented in Fig. 2.14 and 2.15. The transpiration period estimates increased in the order of GDD, LSP and FFD.

Table 2.4 details the mean start and end dates for transpiration for the years of 2017 to 2019 estimated using FFD, GDD and LSP. Overall, the differences in the start and end dates between the three methods were not large. Additionally, the p-values of the one-way ANOVAs and the Kruskal-Wallis tests showed no significance between means (Table 2.5). As the means between the methods are not significantly different, the overall performances between the three methods are considered to be the same. However, using climate-derived estimates is simpler than remotely

sensed imagery due to the ease of access to data. Therefore, growing season lengths for the predicted leaf-level transpiration has been determined using GDD. GDD was selected instead of FFD, as GDD is predominantly used in literature to determine growing season length (Ueyama et al. 2013; Kollas et al. 2014).

In summary, for the years 2019 and 2020, leaf-level tree transpiration was estimated using the CUBE and K_c models, and confined to the growing season lengths of each respective year using the GDD method. T_{avg-t} was then upscaled to T_t (Fig. 2.15). Soil water balance components for the entire 2019 and 2020 growing seasons are included in Table 2.6. Estimates of $\sum T_t$ generated with the CUBE model were slightly greater than with K_c (Eq. [2-8]).

2.4. Discussion

2.4.1. Uncertainties in deep drainage estimates

Apparent precipitation interception and understory grass canopy transpiration losses were such that only 40% of gross precipitation contributed to changes in soil moisture storage (Eq. [2.6]) during the sap flow measurement periods in 2019 and 2020 (Appendix A). This is much higher than most interception loss estimates for hybrid poplar canopies which has been reported to range between 12 and 30% (Petzold et al. 2011; Orsag et al. 2013; Guevara-Escobar et al. 2000) but is consistent with interceptions losses from grass/turf canopies which has been reported to range between 30 and 75% (Dyer et al. 2022; Domingo et al. 1998). In the above-cited works, interception losses were estimated by the difference between precipitation and throughfall for hybrid poplar (Petzold et al. 2011; Orsag et al. 2013; Guevara-Escobar et al. 2000). For grass, Dyer et al. (2022), measured through fall by placing circles of excavated turf canopies in the orifices of tipping bucket rain gauges. Domingo et al. (1998) estimated interception by parameterizing the canopy water balance model of Rutter et al. (1971). In this work, the soil moisture sensors were installed in soil pits located near an opening in the canopy (6-m away from the weather station) and well under the canopy (68-m away from the weather station), which likely would have been affected by interception losses from the hybrid poplar canopy and understory grass canopy, making the estimate of 60% interception loss within the range of the limited literature-reported values cited above. Because the precipitation interception losses were representative of the poplar canopy and

underlying grass canopy, the calculated E may not be the same as between the rows where tillage was used to suppress the grass, creating some uncertainty in the deep drainage estimates presented in Tables 2.2 and 2.6. The understory immediately surrounding the trees was dominated by grasses, but regular tillage operations between rows kept part of the understory bare for at least part of the growing season. Interception losses, then were potentially much lower between tree rows.

The negative drainage estimates during the sap flow measurement periods (Table 2.1) are also consistent with the persistent negative hydraulic gradients at 50 cm below the soil surface during the sap flow measurement periods. Therefore, during the growing season when the canopy is closed and trees are transpiring, the trees access soil water reserves that were replenished during snowmelt, resulting in the negative deep drainage estimates during the sap flow measurement periods. However, the positive hydraulic gradients between the 40- and 60-cm depths after spring snowmelt when transpiration fluxes are relatively low (May 20, 2020 in Fig. 2.9; 2.10) indicate that significant positive deep drainage fluxes below the root zone occur during spring snowmelt. For deep drainage to be zero or negative on an annual basis, positive deep drainage fluxes during snowmelt need to be offset by negative deep drainage fluxes (i.e., capillary rise) equal or greater in magnitude during the growing season. The over-winter change in S prior to the 2020 growing season was approximately 70 mm, and total precipitation (mostly snow) for the same period was 120 mm (Appendix C), suggesting a net loss of 50 mm (40%) to sublimation, comparable to higher estimates for boreal stands (Pomeroy et al. 1998) and lower estimates for grasslands (Pomeroy et al. 1991). Assuming growing season, stand-level transpirational demand in the future is on the order of 300 mm, growing season P_{eff} is 125 mm (based on the long-term average in Table 2.1 and accounting for 60% interception loss), an additional 175 mm of soil water storage would be required to achieve 300 mm of transpiration. If typical over-winter increases in soil water storage remain around 70 mm, the hybrid poplar stand will need to draw on deep soil water reserves (≥ 150 cm below the soil surface) that have accumulated during the wet stacking process which have been prevented from draining below the stack by the clay liner.

2.4.2. Empirical Modeling of Transpiration

Since the length of measurements for transpiration and soil parameters were not the same for the two sampled years, the development of regression models of transpiration allowed for the

expansion of available transpiration data over the entire growing season, permitting for better comparison between years.

Due to the complex interdependence of climate and soil variables through land-atmosphere coupling 8 measured variables were selected to predict transpiration using a regression model (Fig. 2.7). The interplay between temperature, humidity, precipitation and cloud cover have been shown to affect local and regional climate (Betts et al. 2014). This in turn may affect transpiration. Some studies have also shown the coupling dynamics of photosynthesis, transpiration and soil water balance (Daly et al. 2004), while others looked at the inverse relationship between transpiration and vapour pressure deficit (VPD) (Bierhuizen and Slatyer 1965; Tanner and Sinclair 1983; Vadez et al. 2014).

The poorer performance of linear models can be partially accredited to the assumption of full variable independence for the predictor variables, however that is not the case since predictor variables are correlated (Fig. 2.11). Although, the multivariate adaptive regression splines (MARS) model was unable to accurately predict higher transpirations amounts as well as the tree-based models, it had greater success than the linear models (Fig. 2.13; Table 2.3). The success of the MARS model can be attributed to its capabilities to model non-linearity by using linear components bound by hinge functions.

Phenology allows for the determination of the onset and offset of leaves which drive transpiration of trees (Wang et al. 2005). Within the literature, numerous studies were able to validate the use of satellite derived phenology using ground observations, and/or using flux-measured variables like gross primary production (GPP) and net ecosystem production (NEP) (Chuine et al. 2000; Zhang et al. 2006; White et al. 2009; Ganguly et al. 2010; Liang et al. 2011; Wu et al. 2017). Although ground observations of leaf out and leaf senescence are close to the LSP estimates of start and end of season it is difficult to fully validate LSP. Phenometrics obtained from LSP are not the same as the phenophases observed in the field like onset of greenness from LSP vs leaf sprouting observed in the ground observations (Rodriguez-Galiano et al. 2015). Therefore, there is still a need for widely accepted protocol to validate satellite derived phenological data (Caparros-Santiago et al. 2021).

2.5. Conclusions

For this site, over the two growing seasons of measurements, the hybrid poplar phytocap was apparently effective in minimizing or eliminated deep drainage below the root zone and even offset the positive deep drainage that occurred during snowmelt in the spring of 2020 when the trees were not actively transpiring. The clay liner at the base of the PG stack (up to 30 m below the surface) is likely key to retaining deep drainage from spring snowmelt within the stack that can be accessed by the poplars later in the growing season. Because the water balance of only two growing seasons was measured and only one, spring snowmelt recharge event, it is suggested that deep drainage risks over the long-term be further informed by further measurements and/or simulation models. A series of empirical models were used to accurately estimate the transpiration rate of hybrid poplar trees growing on PG. The CUBE model was determined to be the best-performing model out of the nine tested. However, none of the models were able to determine the start and end of the growing season, which required other additional methods to be used. The method of using growing degree days proved to be precise enough considering the simplicity of the method in comparison to other more complicated methods that did not yield significant differences in results despite an increase in complexity. In order to eliminate issues of covariance between independent variables, the use vapor pressure deficit as an independent variable will be explored.

2.6. Works cited

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Table 2.1: Summary of meteorological variables for the 2019 and 2020 growing seasons (April 1 – September 30)

	Growing Season		Long-term average
	2019	2020	
Meteorological Measurement			
P (mm)	362	407	313
Average Daily Air Temperature (°C)	11.7	12.0	12.3
GDD	1329	1502	1425
Average Daily Wind Speed (km hr ⁻¹)	7.1	7.6	9.2
Cumulative Solar Radiation (W m ⁻²)	36264	38395	38077
Average daily relative humidity	72	71	66
Cumulative ETr (mm)	488	518	566

Table 2.2: Summary of soil water balance component estimates during the sap flow measurements periods in the 2019 and 2020 growing seasons.

	Water Balance Component (mm)				
	P	<i>E</i>	$\sum T_t$	ΔS	<i>D</i>
Sap flow Measurement Period					
06/18/2019 – 09/25/2019	253	150	143	-32	-8
05/27/2020 – 09/12/2020	327	194	259	-89	-37

Table 2.3: Performance of regression models in predicting test datasets.

Models	RSE	R2	R2.adj
LM	0.00524	0.889	0.889
GLM	0.00524	0.889	0.889
KNN	0.00455	0.916	0.916
MARS	0.00502	0.898	0.898
PLS	0.00531	0.886	0.886
MLP	0.00705	0.904	0.904
CUBE	0.00357	0.949	0.949
RF	0.00371	0.944	0.944
BOOST	0.00375	0.943	0.943

Table 2.4: Start and end times for the three growing season length estimation methods and ground observations.

Type	Start (month-day)	End (month-day)
Ground observations	05-11	09-18
Growing degree days (GDD)	04-17	10-11
Phenology	05-11	10-19
Frost free days (FFD)	04-14	10-16

Table 2.5: Comparisons of means using one-way ANOVAs and Kruskal-Wallis rank sum tests between the three growing season length estimation methods (FFD, GDD, and phenology).

	One-way ANOVA	Kruskal-Wallis rank sum test
Start of transpiration	0.0635	0.1125
End of transpiration	0.0847	0.06939

Table 2.6: Comparison of growing season soil water balance component estimated with cumulative growing season transpiration based on the CUBE model and the Kc model.

	Water Balance Component (mm)						
Predicted Transpiration Period	P	E	$\sum T_t$ estimated with CUBE	$\sum T_t$ estimated with K_c	ΔS^*	D based on $\sum T_t$ estimated with CUBE	D based on $\sum T_t$ estimated with K_c
05/05/2019 – 10/01/2019	362	217	220	218	-84	9	11
04/25/2020 – 10/11/2020	412	247	332	329	-118	-49	-46

*based on the maximum observed soil water storage (330 mm on April 28, 2020) and minimum observed soil water storage in 2019 and 2020 growing seasons.

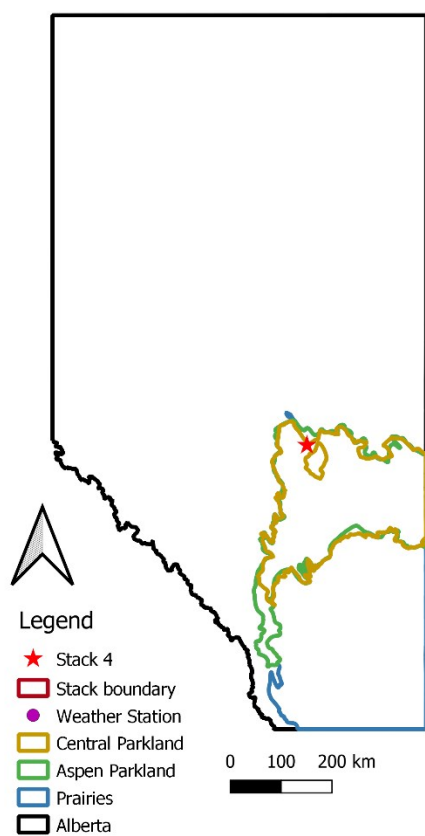


Figure 2.1: Location of Nutrien Nitrogen Operations facility in Fort Saskatchewan, Alberta, Canada, with an aerial map of the facility detailing the study stack (red).

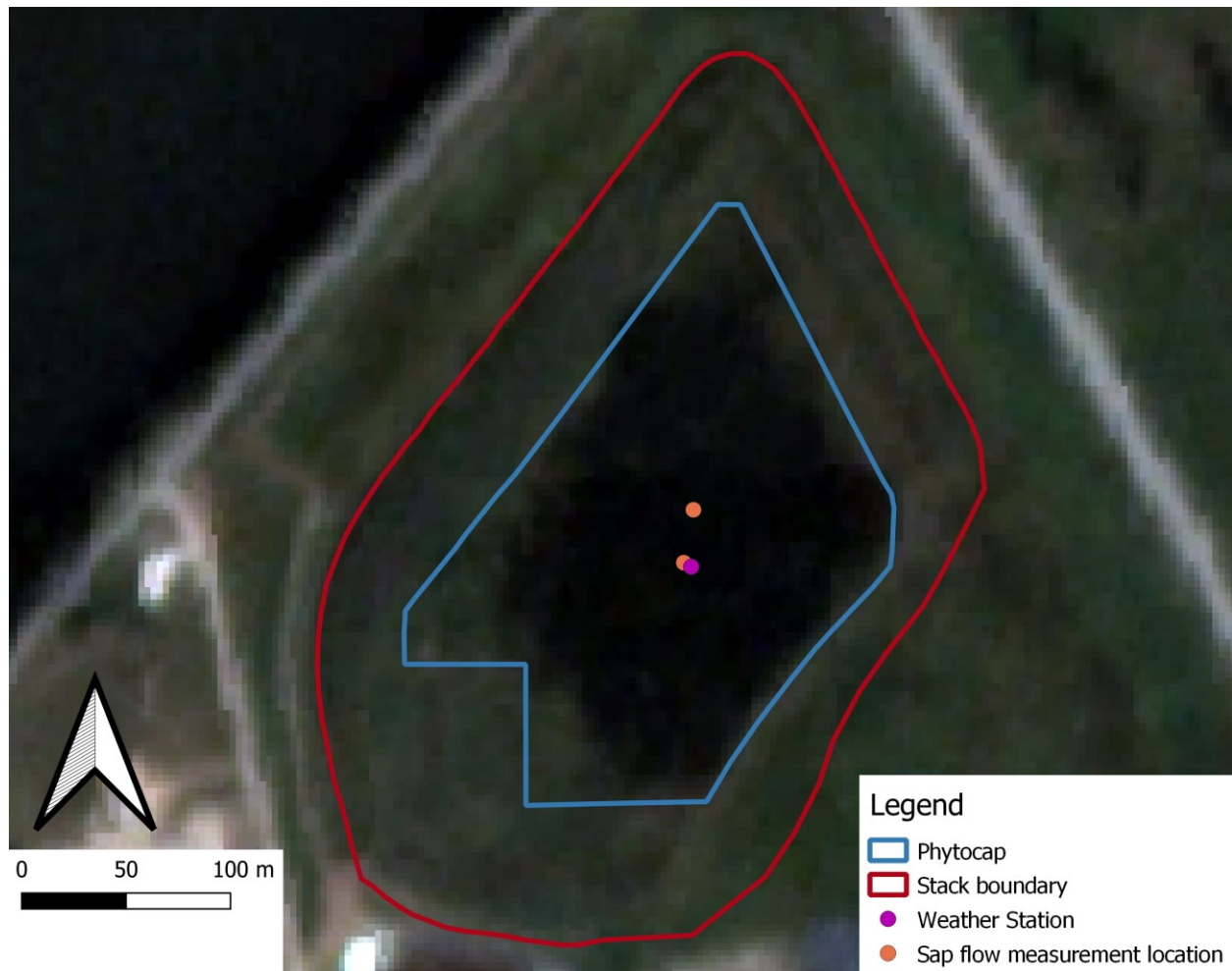


Figure 2.2: Satellite imagery of the study stack, detailing the stack boundary and the phytocap boundary, along with equipment to measure climate variables (incoming solar radiation, air temperature, relative humidity, wind speed, rain) and sap flow.

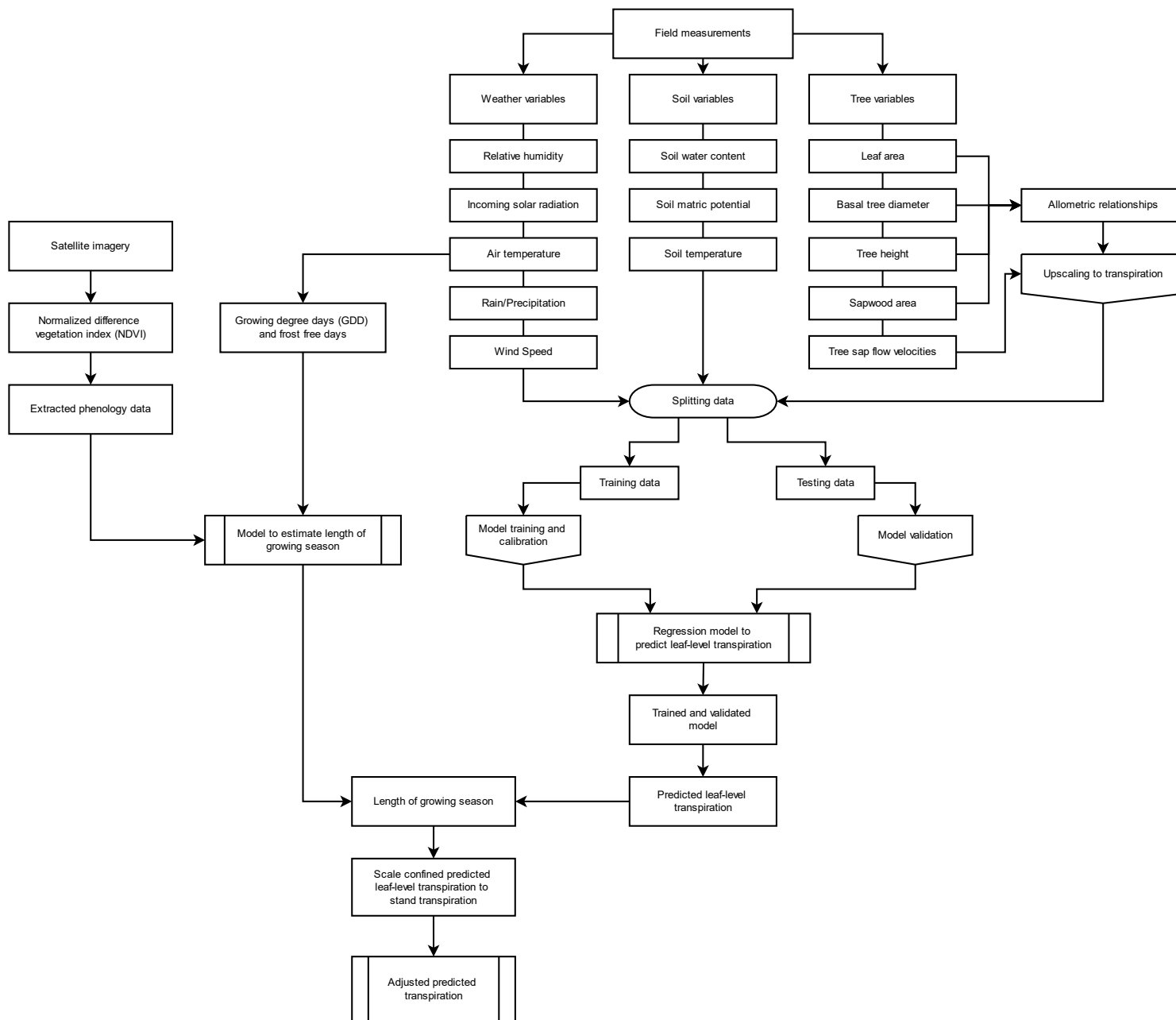


Figure 2.3: Workflow diagram detailing methods used throughout the chapter.

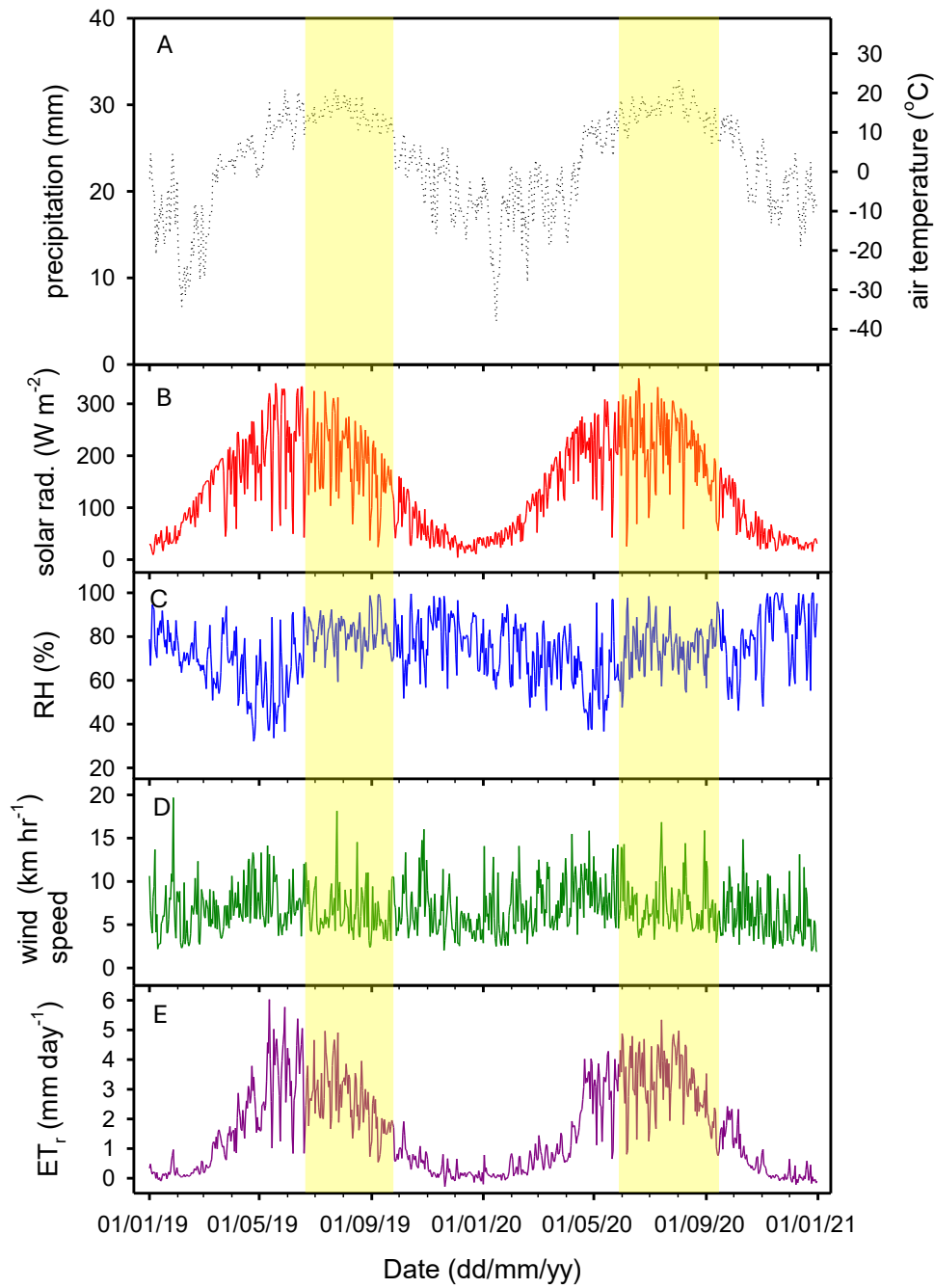


Figure 2.4: Daily time series of meteorological variables measured at the Nutrien, Fort Saskatchewan facility over the study period. The yellow-shaded areas represent the sap flow measurement periods. A) Daily average air temperature (line) and daily precipitation (bars); B) daily average solar radiation; C) relative humidity; D) daily average wind speed; E) daily reference evapotranspiration (Penman-Monteith).

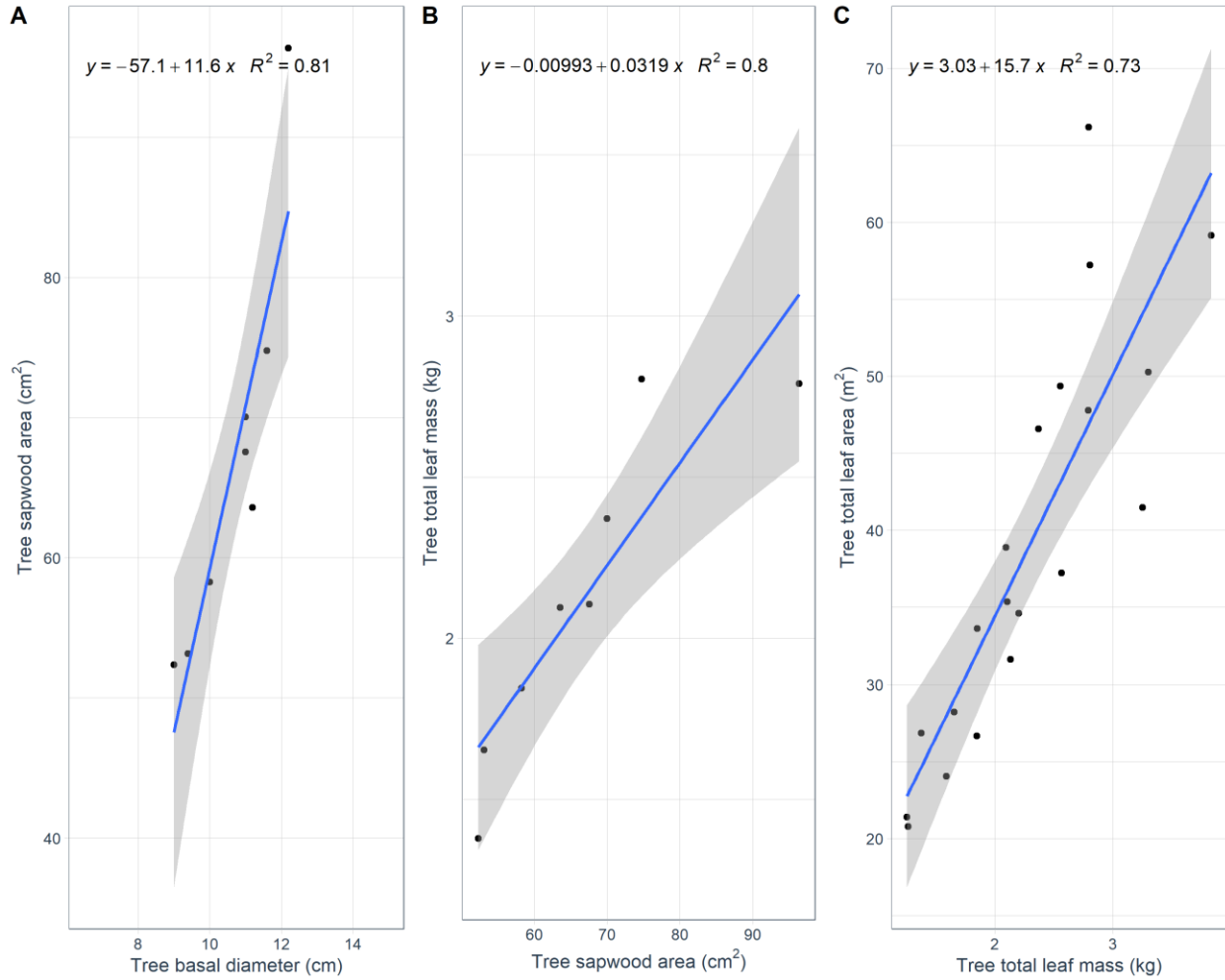


Figure 2.5: Series of linear regressions of allometric relationships between various measured tree properties to determine indirect relationship between tree basal diameter and tree leaf area. A) and B) are based on tree sapwood area measurements (n=8) from the 2019 season while C) is based on tree leaf area measurements (n=20).

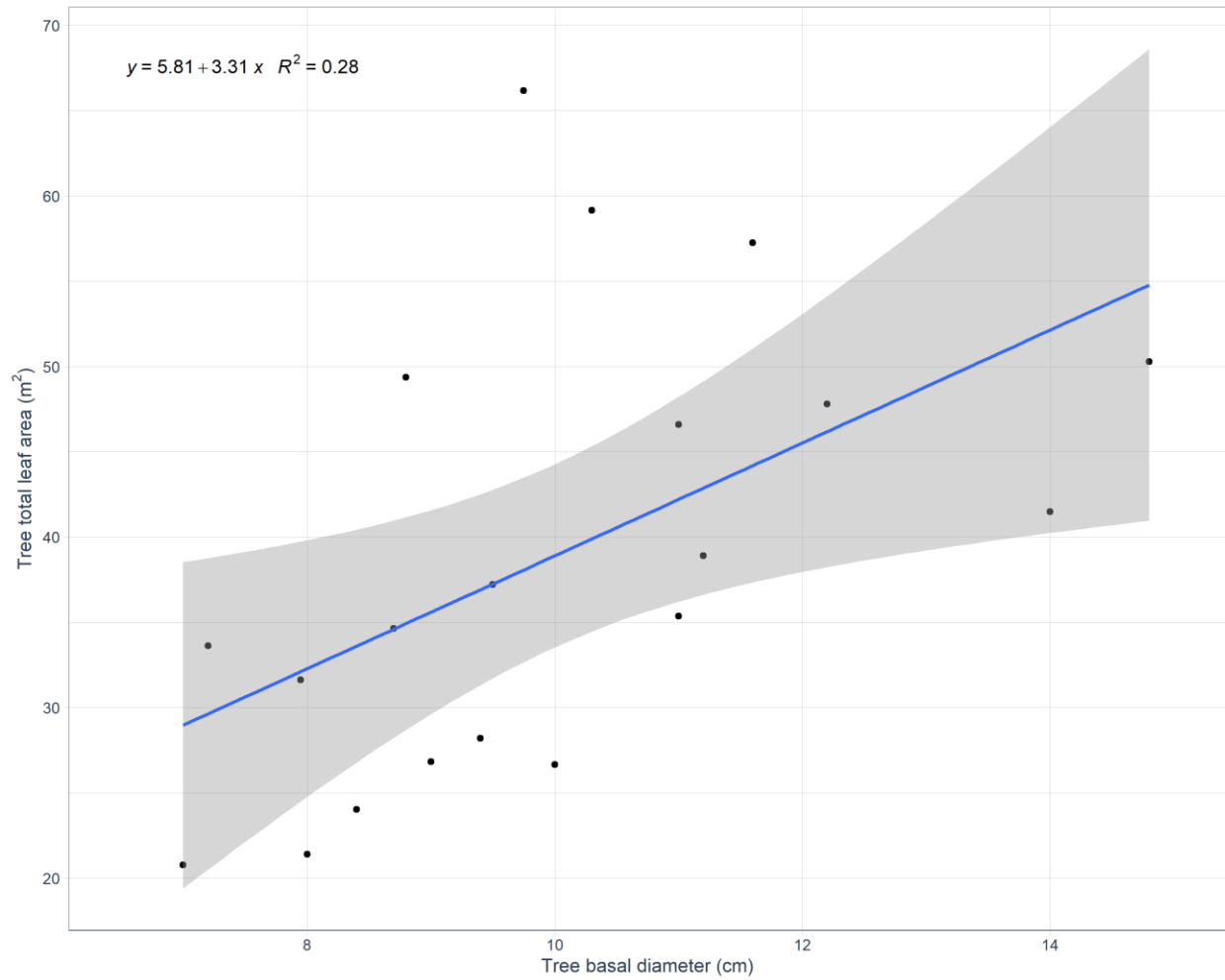


Figure 2.6: Linear regression to determine the direct allometric relationship between tree basal diameter and tree leaf area.

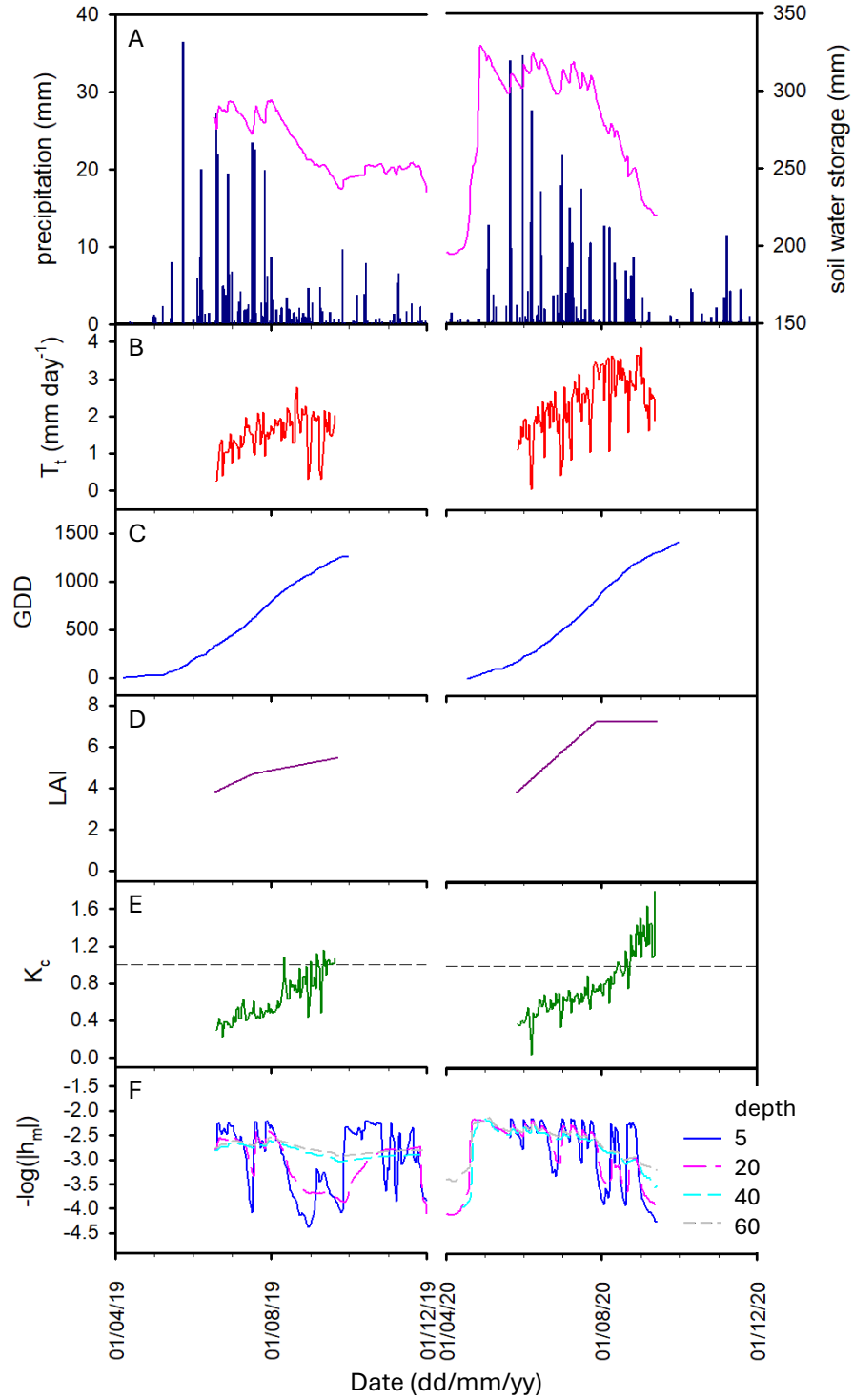


Figure 2.7: Daily time series of 2019 and 2020 growing season A) daily precipitation (bars) and daily average soil moisture storage (line); B) daily stand-level transpiration; C) growing degree days; D) leaf area index; E) crop coefficient (Eq. [2-8]); and F) matric potential at 5,20-,40 and 60-cm below the soil surface.

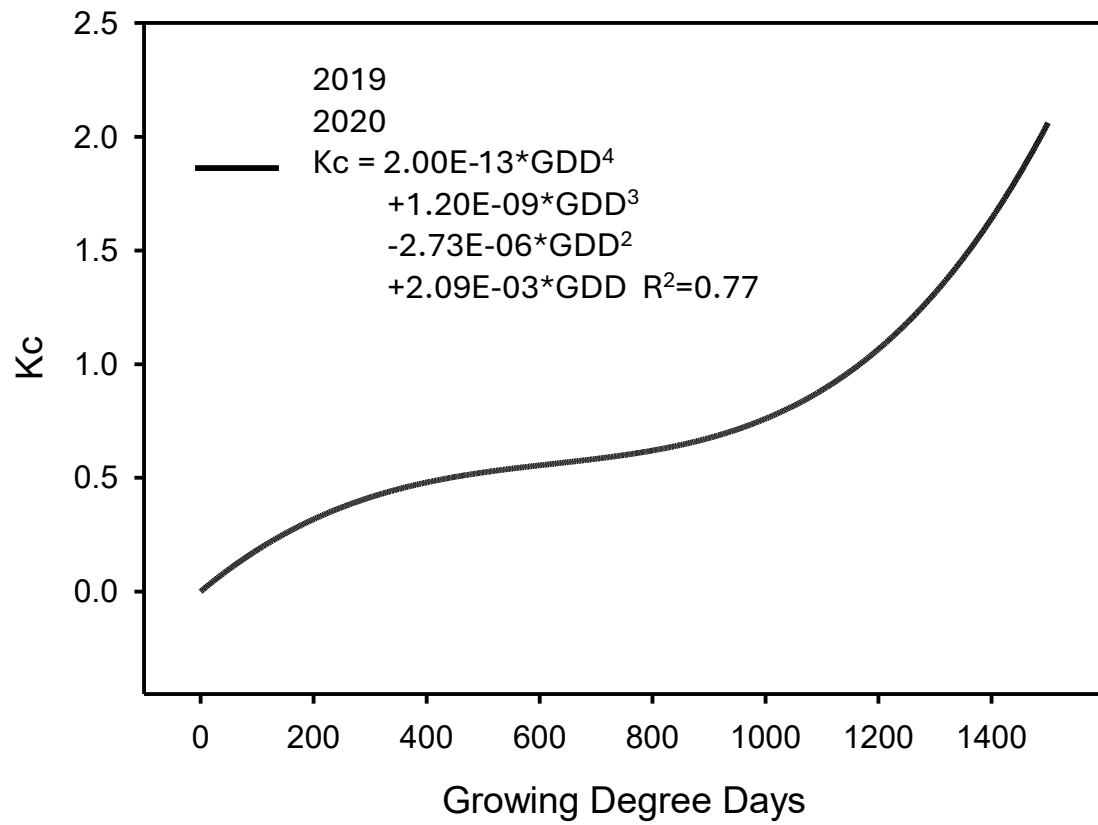


Figure 2.8: Relationship between estimated K_c (Eq. [2-8]) and growing degree days during the 2019 and 2020 sap flow measurement periods.

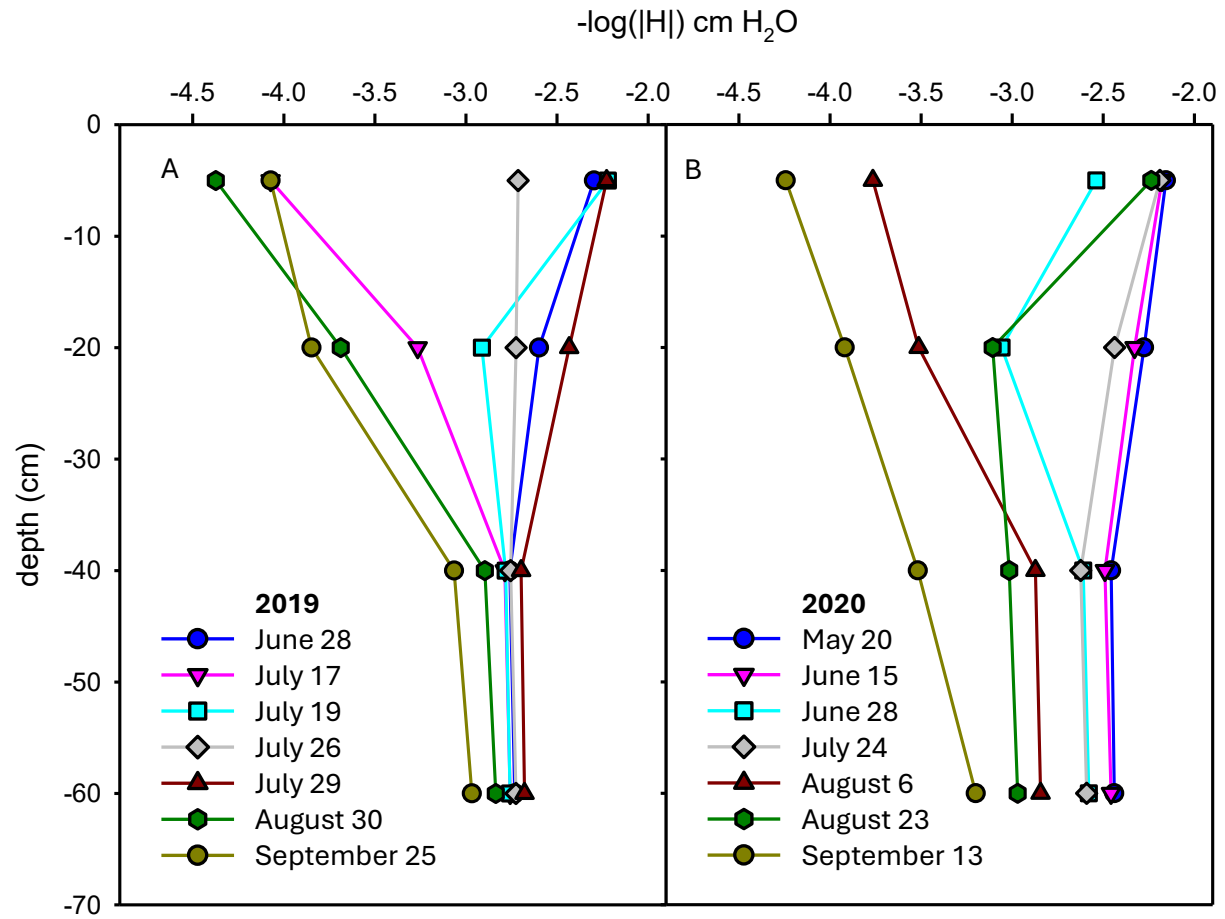


Figure 2.9: Hydraulic potential (Eq. [2-2]) profiles for selected dates during the 2019 and 2020 sap flow measurement periods.

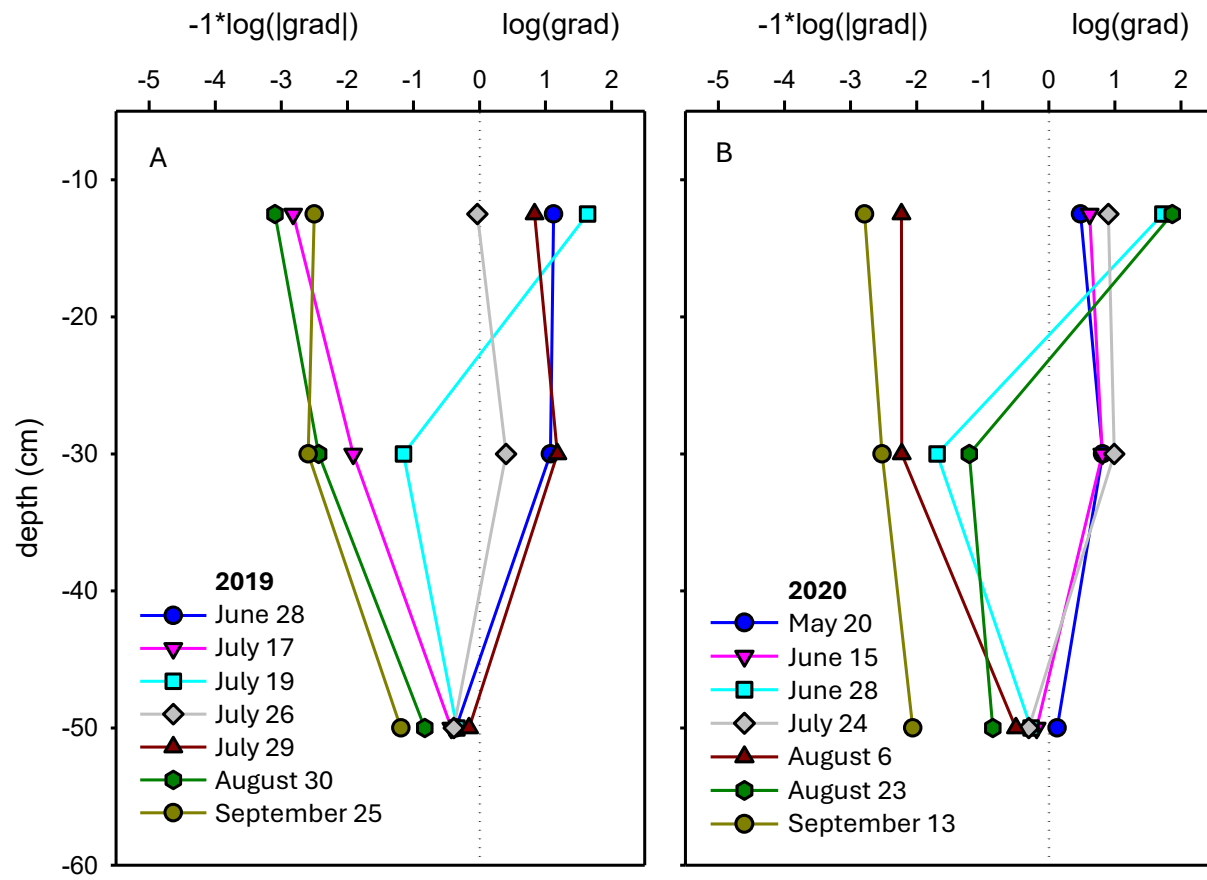


Figure 2.10: Hydraulic gradient ($\text{grad} = \Delta H / \Delta z$) profiles for selected dates during the 2019 and 2020 sap flow measurement periods.

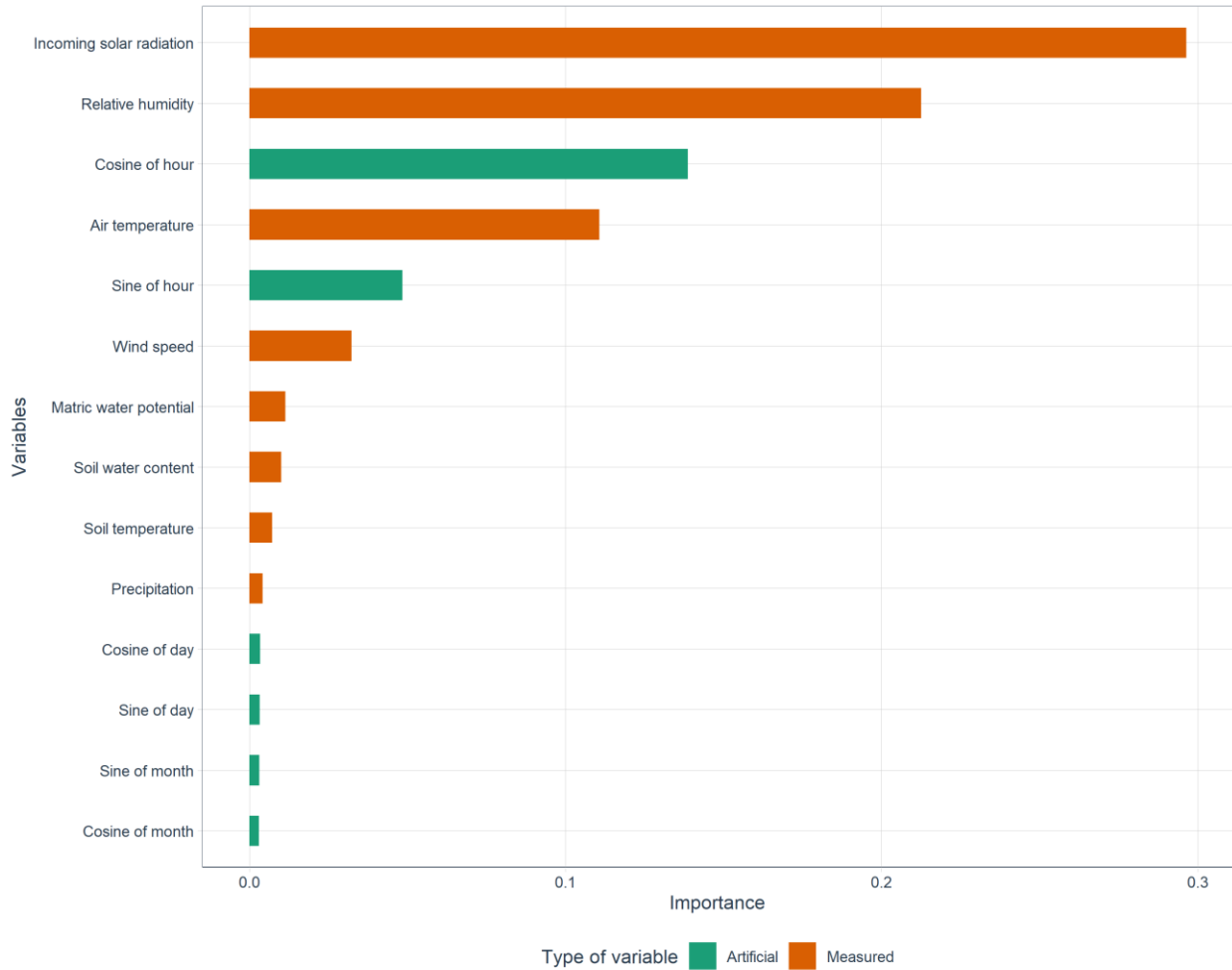


Figure 2.11: Importance of input variables used in the regression models to predict stand transpiration using the Gini Impurity Index. Artificial variables are generated variables to represent the cyclicity of time for the regression models.

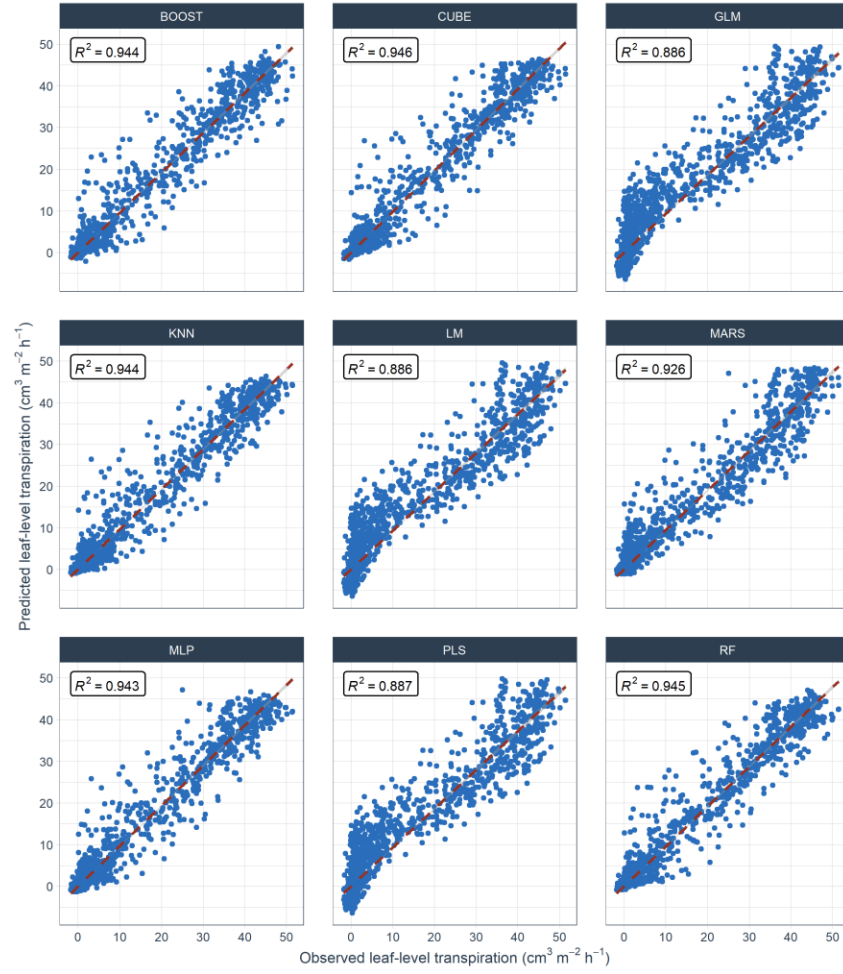


Figure 2.12: Linear regressions comparing predicted stand transpiration to observed stand transpiration using 9 regression models.



Figure 2.13: Pearson correlation between hourly input variables used in the regression models.

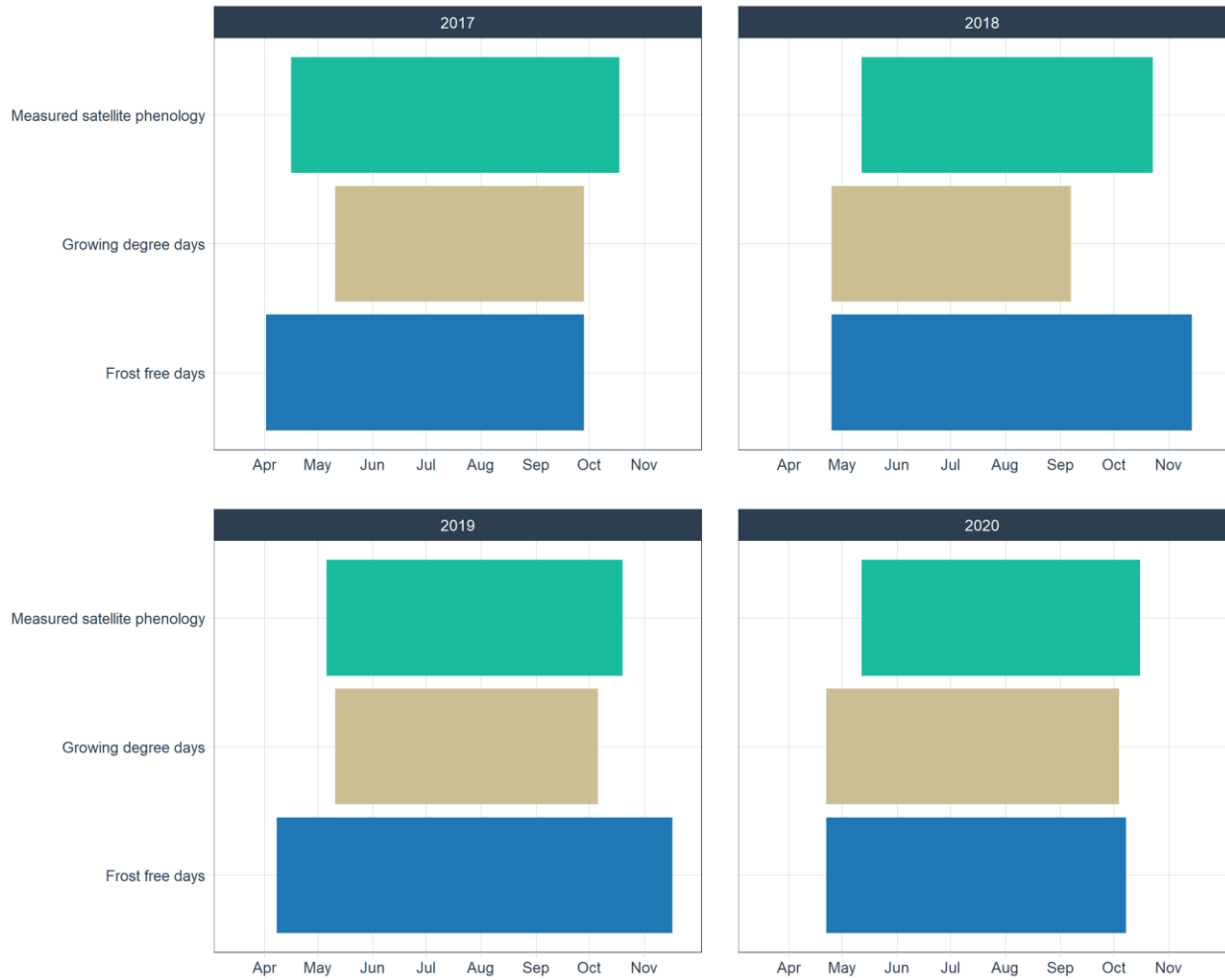


Figure 2.14: Estimations of the length of the growing season using 4 estimates. Boxes represent the full length of the growing season, the left edge representing the start, and the right edge representing the end.

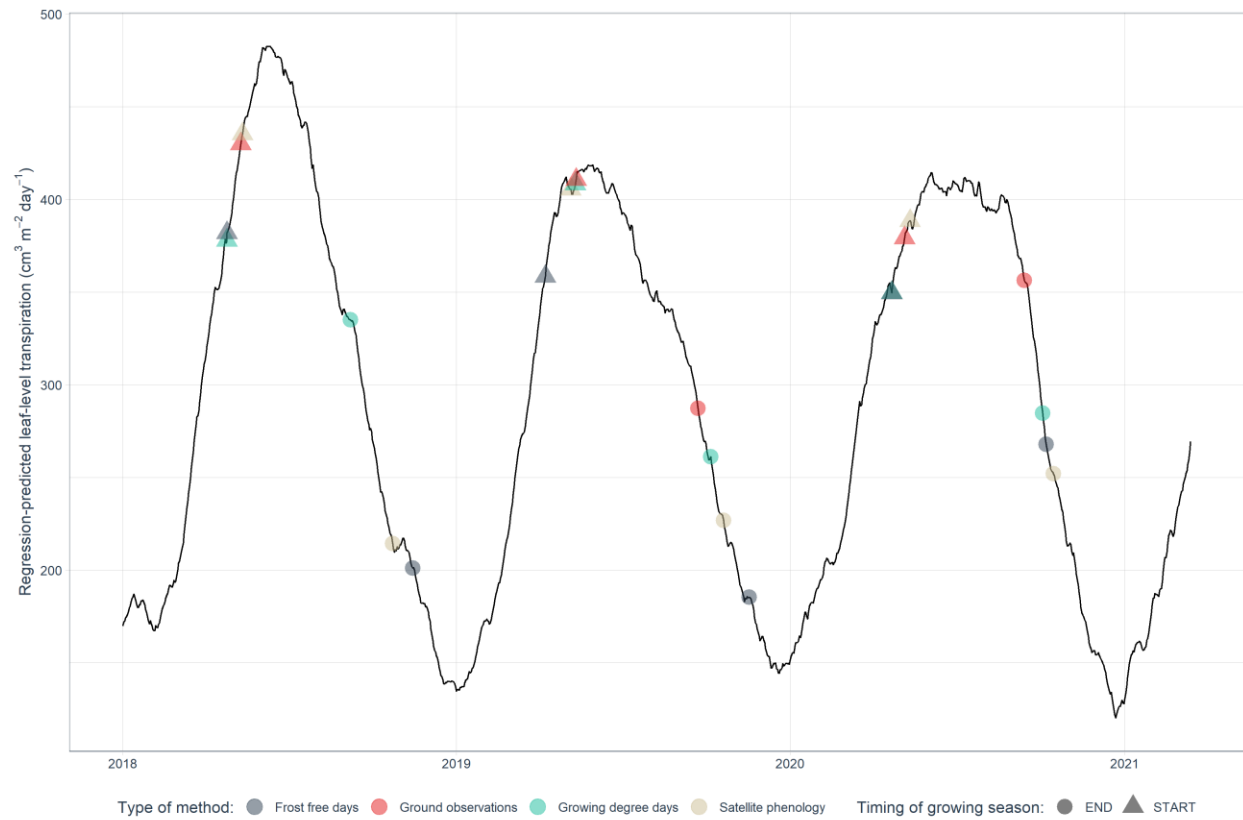


Figure 2.15: Estimated start and end dates of yearly growing seasons using the 4 estimates. Triangles represent the beginning of the growing season; circles represent the end of the growing season. A rolling mean of 96 hours (4 days) of predicted hourly stand transpiration was used to denoise and smooth the transpiration. The predicted transpiration was estimated using the best-performing regression model.

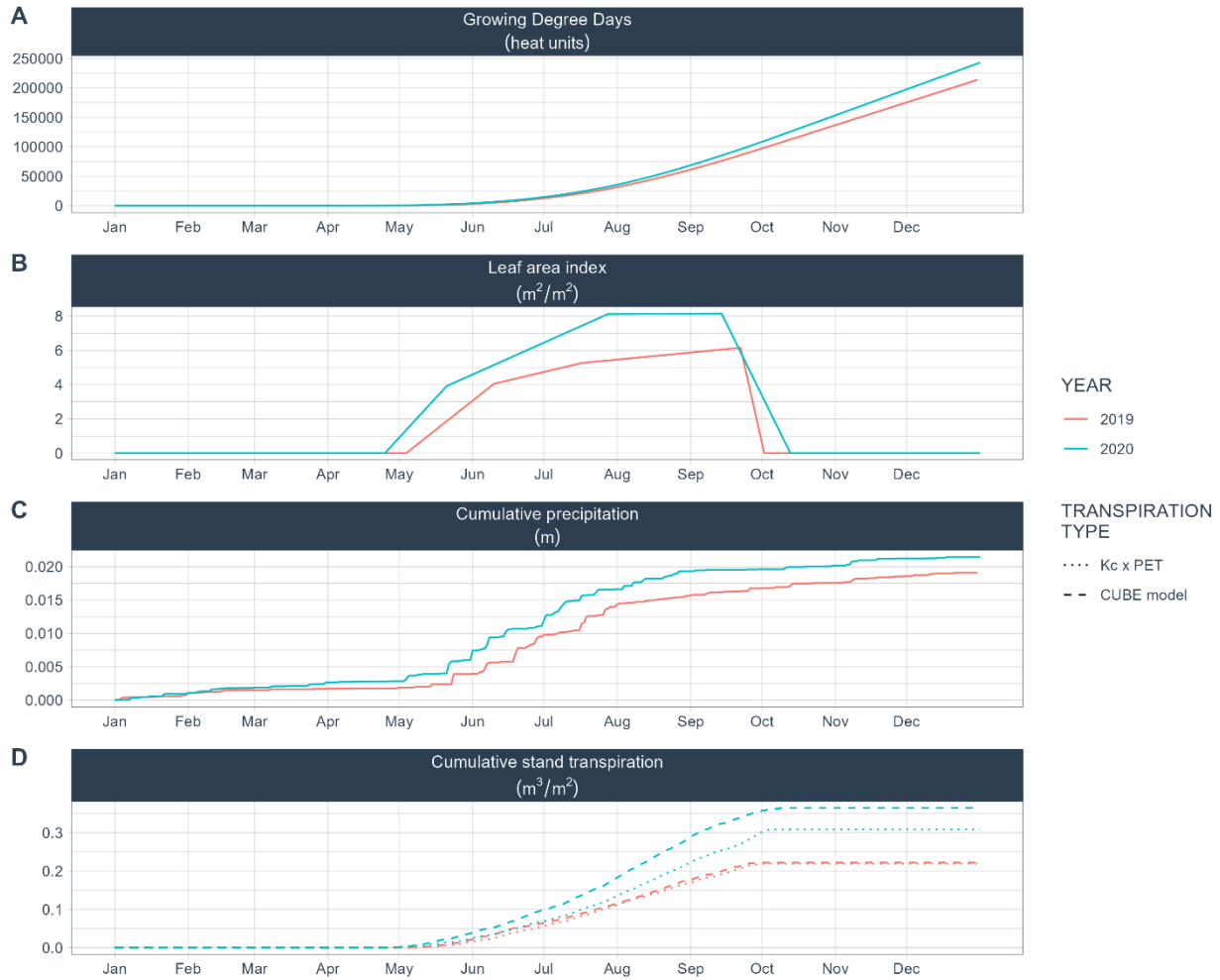


Figure 2.16: Growing season comparison of growing degree days, leaf area index, cumulative precipitation, and cumulative predicted stand transpiration between 2019 and 2020 which has been confined to the estimated length of the growing season. Cumulative variables are used for comparison between years.

3. Conclusion

Using phytocaps to manage PG stacks offers sustainable and innovative advantages over traditional, engineered caps that use liners beneath topsoil caps. The key to the efficacy of phytocapping is, in part, determined by the capacity of trees to regulate water through evapotranspiration. The primary research objective was to measure the actual evapotranspiration and water balance in a hybrid poplar phytocap and to correlate the actual evapotranspiration with various meteorological observations to quantify part of the phytocap performance.

The use of predictive models to estimate tree transpiration is important for determining the success of phytocapping. Optimizing the planting density and selecting the appropriate tree species to fit site conditions can maximize water uptake and minimize deep drainage below the root zone. By accurately predicting transpiration rates, the performance of the phytocap can be maximized by incorporating site-specific rainfall patterns and evapotranspiration demands to promote the dewatering of the PG stacks, thus enhancing the stability of the stack.

Predicting transpiration using empirical models can be considered a black-box approach since the model is built using the relationships between transpiration and several predictors, and not known environmental processes that are used in process-based models, like the FAO Penman-Monteith equation or the Hargreaves equation, among others.

Other tools, such as hydrological models, have practical implications on phytocap performance as they can inform the optimization of gypsum stack design even before construction begins. By simulating different configurations and scenarios, the most efficient layouts and parameters that enhance water management can be identified. Furthermore, hydrological models can be useful in assessing deep drainage during times of spring snowmelt as they are able to simulate snowmelt dynamics, including the timing and intensity of melting, as well as the capacity of vegetation to uptake and transpire water and the soil to store the water. By integrating these factors, models provide insights into whether phytocaps negate the positive deep drainage that occurs during snowmelt later in the growing season. Hydrological models can also integrate the clay liner at the bottom of the stack to understand the role of capillary rise during times of soil moisture storage shortage and how different soil parameters interact with vegetation dynamics to moderate water fluxes.

Finally, future work regarding phytocap performance would involve investigating the environmental impacts and sustainability benefits related to using hybrid poplars for carbon sequestration and fibre sources, as well as the challenges with implementing phytocaps, such as managing tree health and risk of disease considering the use of clones and the potential need for irrigation during drought conditions.

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Appendix A: Proportion of precipitation lost to canopy interception

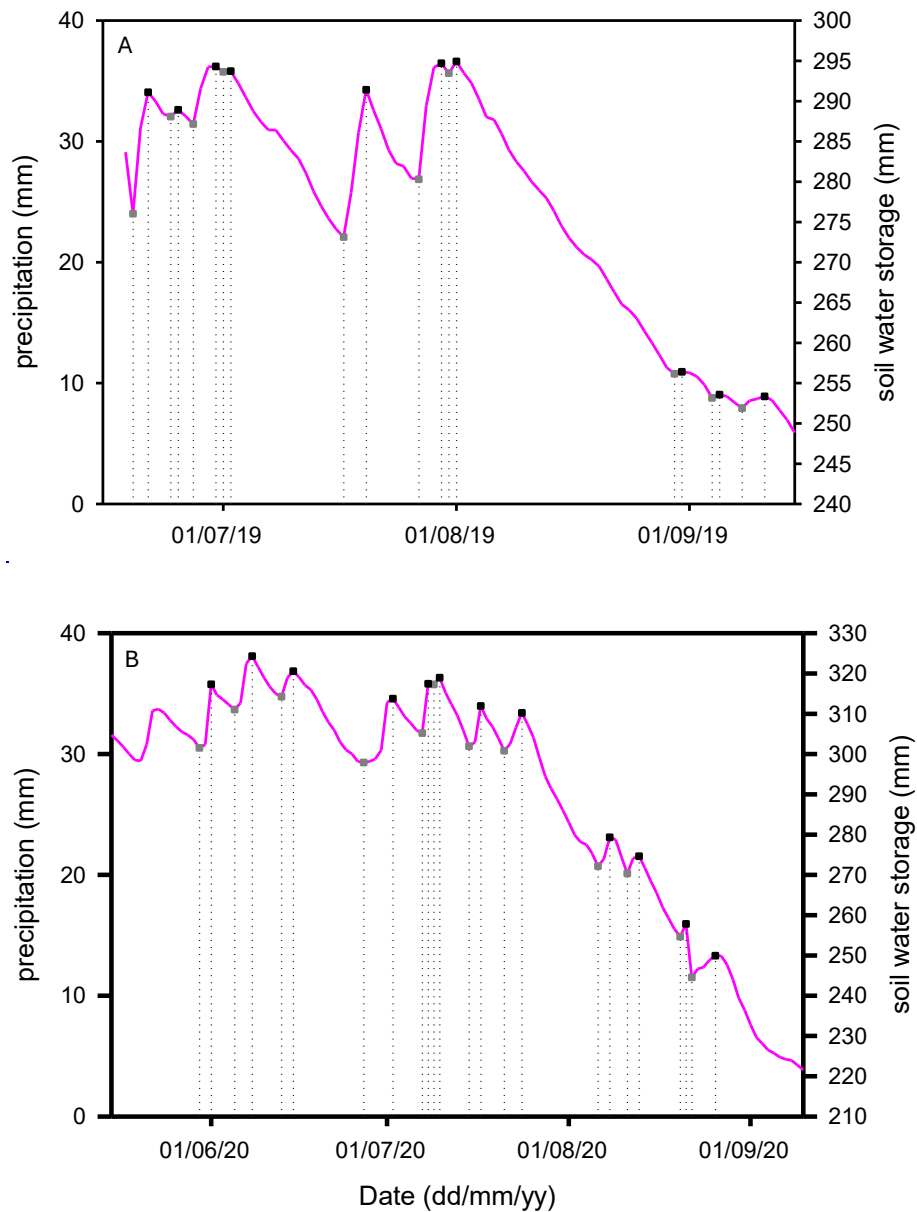


Figure A.1: Summary of events used to compare changes in soil moisture storage and precipitation in Fig. A.2 for the 2019 (A) and 2020 (B) sap flow measurement periods. The gray and blue dots represent the soil moisture storage prior to and following the precipitation events bounded by the dashed drop lines.

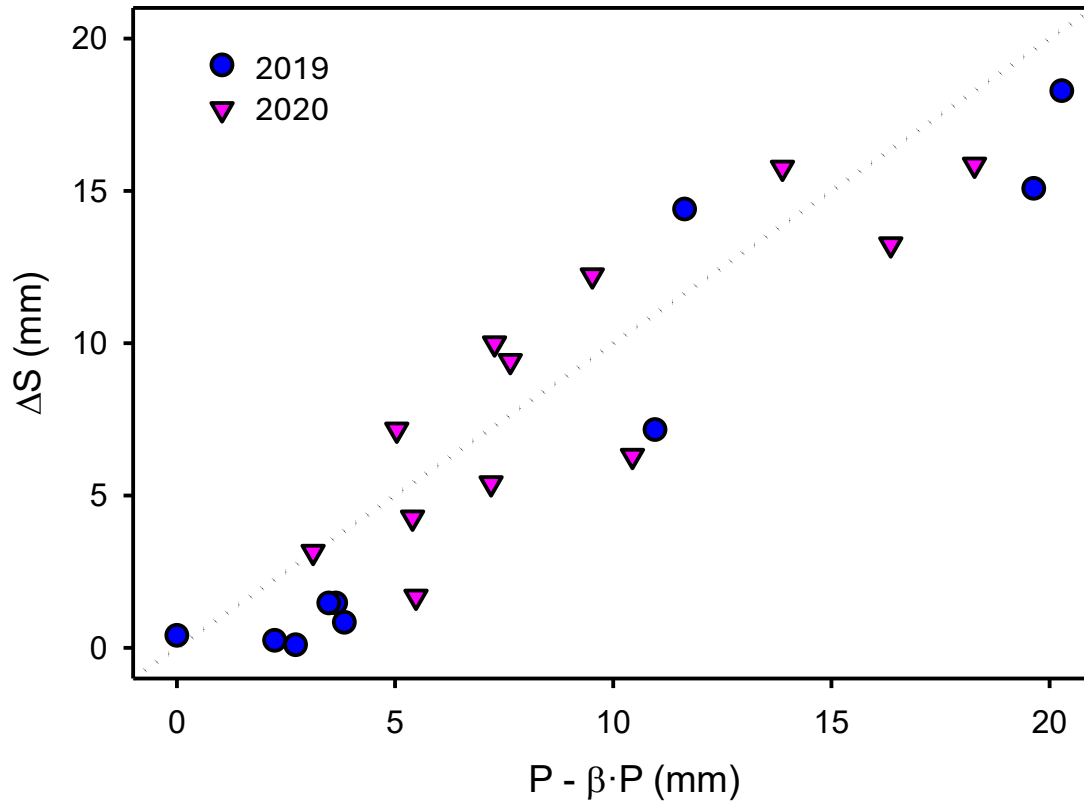


Figure A.2: Event-based changes in soil moisture storage (Fig. A.1) versus effective precipitation (Eq. [2.6]) for 2019 and 2020 sap flow measurement periods. The estimated proportion of precipitation lost to surface evaporation (β) required to for $P - \beta \cdot P$ verses ΔS to fall on the 1:1 line (dashed line) was 0.6. $E = 0.6 \cdot P$.

Appendix B: Supplementary Figures

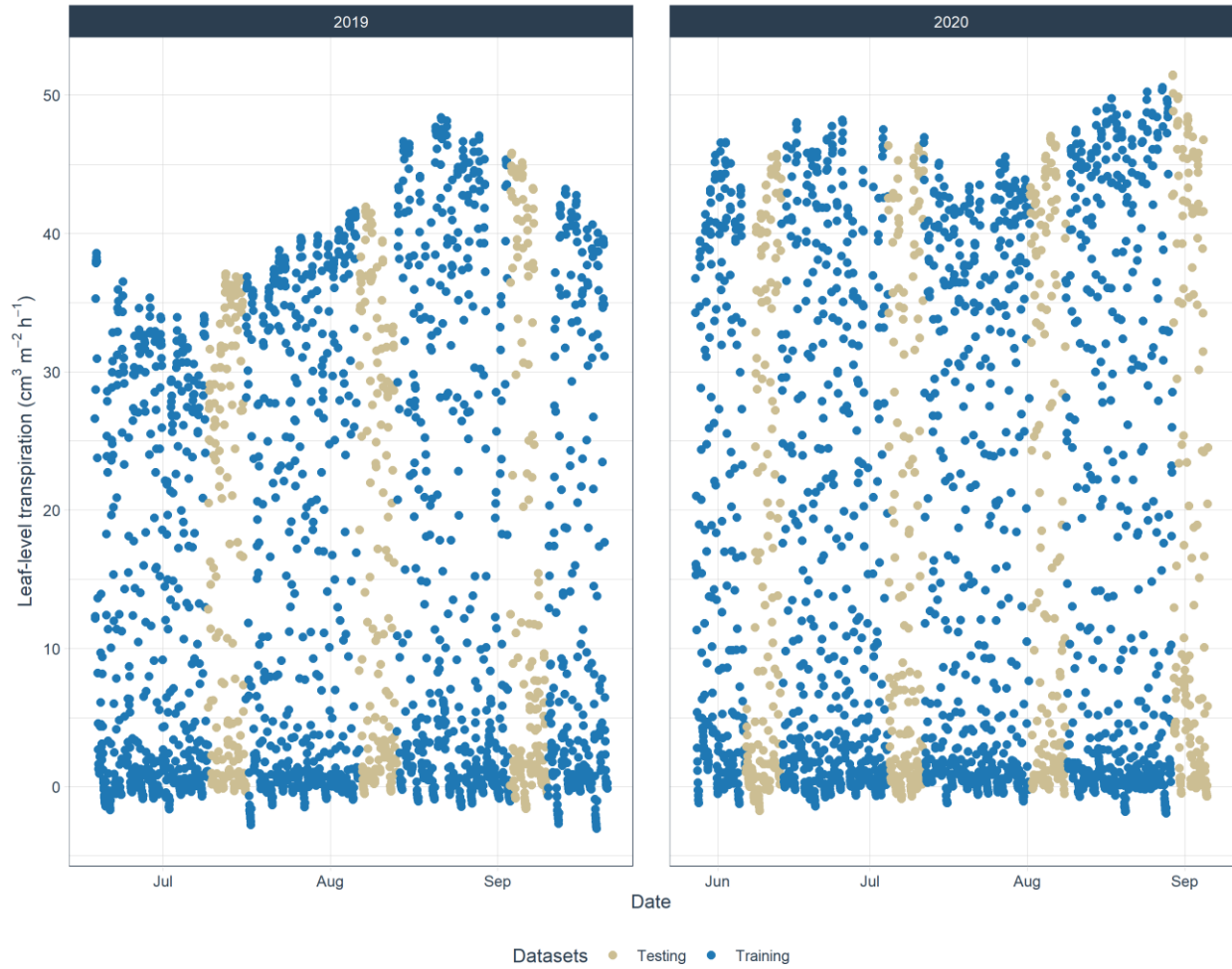


Figure B.1: Division of measured hourly stand transpiration into training and testing datasets. Training sets were 3 weeks long and testing sets were 1 weeklong.

Appendix C: Data

Date	Year	leaf-level transpiration (mm/year)	daily solar radiation (W/m2 day)	daily precipitation (mm)	daily GDD	cumulative GDD	Air Temp (celsius)	Relative Humidity (%)	Windspeed (km/hr)	Average S (cm)	PET (mm/day)	LAI_LT	stand-level PET transpiration (mm/day)
2019-01-01	2019		28.19	1.10	0.00	0.00	-1.63	78.81	10.64		0.34		
2019-01-02	2019		29.68	0.00	0.00	0.00	4.69	66.75	6.62		0.48		
2019-01-03	2019		23.37	0.00	0.00	0.00	0.76	77.98	5.05		0.25		
2019-01-04	2019		14.59	7.60	0.00	0.00	-3.27	94.67	4.00		0.14		
2019-01-05	2019		9.28	0.70	0.00	0.00	-5.05	93.31	8.17		0.21		
2019-01-06	2019		15.13	0.30	0.00	0.00	-4.58	92.35	9.38		0.19		
2019-01-07	2019		36.91	0.10	0.00	0.00	-13.72	76.27	13.69		0.20		
2019-01-08	2019		49.07	0.10	0.00	0.00	-21.08	72.86	4.12		0.00		
2019-01-09	2019		28.13	0.20	0.00	0.00	-12.10	70.30	6.18		0.20		
2019-01-10	2019		35.09	0.30	0.00	0.00	-18.17	83.91	2.18		-0.01		
2019-01-11	2019		43.39	0.50	0.00	0.00	-13.20	80.57	2.73		-0.05		
2019-01-12	2019		31.60	0.00	0.00	0.00	-9.33	85.43	2.79		0.02		
2019-01-13	2019		47.47	0.00	0.00	0.00	-12.00	87.38	2.79		-0.09		
2019-01-14	2019		56.57	0.00	0.00	0.00	-5.60	81.71	5.18		-0.08		
2019-01-15	2019		22.90	0.00	0.00	0.00	-10.54	91.88	5.39		0.09		
2019-01-16	2019		16.69	0.00	0.00	0.00	-13.91	85.83	6.04		0.15		
2019-01-17	2019		35.66	0.30	0.00	0.00	-18.56	78.67	5.93		0.09		
2019-01-18	2019		34.37	1.30	0.00	0.00	-15.91	75.21	7.69		0.16		
2019-01-19	2019		38.18	0.40	0.00	0.00	-14.08	78.61	9.55		0.17		
2019-01-20	2019		64.24	0.20	0.00	0.00	-8.17	72.13	4.03		-0.02		
2019-01-21	2019		33.91	0.20	0.00	0.00	-4.28	87.61	4.07		0.11		
2019-01-22	2019		28.88	0.40	0.00	0.00	-5.61	83.47	5.60		0.21		
2019-01-23	2019		51.83	0.00	0.00	0.00	-15.65	77.56	8.14		0.12		
2019-01-24	2019		31.57	0.60	0.00	0.00	-11.08	81.71	7.89		0.20		
2019-01-25	2019		31.75	0.20	0.00	0.00	-0.03	75.23	10.89		0.59		

2019-01-26	2019		31.32	0.10	0.00	0.00	4.55	73.33	9.97		0.77		
2019-01-27	2019		36.90	0.50	0.00	0.00	1.15	71.14	19.67		0.97		
2019-01-28	2019		39.52	0.00	0.00	0.00	-8.42	77.96	7.80		0.27		
2019-01-29	2019		65.75	0.20	0.00	0.00	-13.68	73.65	4.66		0.09		
2019-01-30	2019		30.34	2.80	0.00	0.00	-7.49	87.44	3.43		0.17		
2019-01-31	2019		44.60	0.70	0.00	0.00	-2.15	80.71	8.85		0.36		
2019-02-01	2019		37.53	6.50	0.00	0.00	-18.27	78.13	8.75		0.17		
2019-02-02	2019		56.21	0.60	0.00	0.00	-23.62	73.28	7.63		0.11		
2019-02-03	2019		45.38	0.40	0.00	0.00	-28.99	66.46	8.85		0.10		
2019-02-04	2019		59.32	0.00	0.00	0.00	-28.50	68.65	2.93		0.06		
2019-02-05	2019		72.24	0.30	0.00	0.00	-34.30	63.52	2.30		0.04		
2019-02-06	2019		70.63	0.40	0.00	0.00	-28.87	67.71	2.39		0.05		
2019-02-07	2019		74.51	1.10	0.00	0.00	-26.63	69.60	3.31		0.07		
2019-02-08	2019		87.60	0.50	0.00	0.00	-24.18	72.85	9.86		0.13		
2019-02-09	2019		90.48	0.30	0.00	0.00	-31.55	68.85	2.77		0.05		
2019-02-10	2019		75.30	0.70	0.00	0.00	-26.76	69.86	3.94		0.09		
2019-02-11	2019		79.06	0.00	0.00	0.00	-23.63	72.58	5.48		0.12		
2019-02-12	2019		84.74	0.50	0.00	0.00	-27.80	71.65	3.07		0.08		
2019-02-13	2019		98.23	0.10	0.00	0.00	-29.17	66.93	2.54		0.07		
2019-02-14	2019		100.11	0.50	0.00	0.00	-27.90	69.35	2.87		0.08		
2019-02-15	2019		69.01	0.70	0.00	0.00	-23.03	74.93	3.93		0.12		
2019-02-16	2019		84.95	3.60	0.00	0.00	-17.10	77.24	7.21		0.20		
2019-02-17	2019		82.09	0.00	0.00	0.00	-20.42	77.05	6.95		0.17		
2019-02-18	2019		113.71	0.10	0.00	0.00	-21.52	69.70	6.19		0.18		
2019-02-19	2019		83.55	0.00	0.00	0.00	-8.89	80.05	7.35		0.33		
2019-02-20	2019		62.73	0.50	0.00	0.00	-8.00	87.11	10.38		0.31		
2019-02-21	2019		120.88	0.10	0.00	0.00	-14.84	74.91	6.71		0.26		
2019-02-22	2019		90.77	0.10	0.00	0.00	-10.26	68.27	6.19		0.41		
2019-02-23	2019		80.40	0.10	0.00	0.00	-15.66	69.82	12.33		0.36		
2019-02-24	2019		128.15	0.00	0.00	0.00	-21.50	66.83	2.99		0.19		

2019-02-25	2019		125.72	0.00	0.00	0.00	-27.59	67.31	2.73		0.13		
2019-02-26	2019		128.77	0.10	0.00	0.00	-19.96	64.27	5.45		0.26		
2019-02-27	2019		107.30	0.00	0.00	0.00	-8.25	67.00	9.08		0.58		
2019-02-28	2019		131.43	0.00	0.00	0.00	-9.66	64.75	8.32		0.56		
2019-03-01	2019		142.66	0.00	0.00	0.00	-24.73	67.00	7.78		0.21		
2019-03-02	2019		144.15	0.00	0.00	0.00	-26.69	63.17	5.96		0.19		
2019-03-03	2019		145.96	0.00	0.00	0.00	-22.41	61.77	5.76		0.26		
2019-03-04	2019		150.92	0.10	0.00	0.00	-16.20	56.13	7.83		0.46		
2019-03-05	2019		150.82	0.00	0.00	0.00	-15.90	69.31	7.27		0.39		
2019-03-06	2019		152.33	0.00	0.00	0.00	-16.44	74.98	6.77		0.35		
2019-03-07	2019		147.92	0.00	0.00	0.00	-14.69	74.71	4.79		0.38		
2019-03-08	2019		91.75	3.70	0.00	0.00	-9.85	85.25	9.08		0.39		
2019-03-09	2019		163.07	0.00	0.00	0.00	-9.99	72.14	4.75		0.55		
2019-03-10	2019		172.51	0.00	0.00	0.00	-10.13	64.60	5.64		0.63		
2019-03-11	2019		151.35	0.00	0.00	0.00	-0.25	50.90	5.09		1.13		
2019-03-12	2019		143.63	0.00	0.00	0.00	0.20	61.04	8.87		1.23		
2019-03-13	2019		175.74	0.00	0.00	0.00	-0.79	58.46	7.22		1.20		
2019-03-14	2019		176.15	0.00	0.00	0.00	-2.58	58.67	4.62		1.01		
2019-03-15	2019		180.78	0.00	0.00	0.00	0.62	56.27	7.86		1.39		
2019-03-16	2019		181.10	0.00	0.00	0.00	-2.79	63.94	4.48		0.99		
2019-03-17	2019		172.04	0.00	0.00	0.00	3.64	57.66	7.24		1.56		
2019-03-18	2019		184.63	0.00	0.00	0.00	4.66	53.98	5.89		1.64		
2019-03-19	2019		188.58	0.00	0.00	0.00	4.48	56.46	4.34		1.51		
2019-03-20	2019		192.63	0.00	0.00	0.00	3.15	63.74	3.45		1.34		
2019-03-21	2019		194.13	0.00	0.00	0.00	1.05	77.76	3.41		1.16		
2019-03-22	2019		195.15	0.00	0.00	0.00	0.12	88.74	3.86		1.05		
2019-03-23	2019		170.05	0.00	0.00	0.00	0.81	81.12	4.73		1.09		
2019-03-24	2019		102.88	0.00	0.00	0.00	0.38	86.55	7.13		0.81		
2019-03-25	2019		44.52	0.00	0.00	0.00	1.21	86.97	7.23		0.66		
2019-03-26	2019		59.88	1.00	0.00	0.00	1.61	93.95	4.89		0.62		

2019-03-27	2019		141.75	0.00	0.00	0.00	1.50	75.45	7.24		1.19		
2019-03-28	2019		211.77	0.00	0.00	0.00	1.96	69.02	5.35		1.51		
2019-03-29	2019		172.98	0.00	0.00	0.00	3.15	67.95	4.58		1.45		
2019-03-30	2019		216.55	0.00	0.00	0.00	3.49	69.09	8.96		1.75		
2019-03-31	2019		125.53	0.10	0.00	0.00	2.06	70.42	5.55		1.24		
2019-04-01	2019		172.51	0.30	0.00	0.00	3.20	73.50	10.63		1.54		
2019-04-02	2019		201.38	0.00	0.00	0.00	0.87	66.78	8.23		1.57		
2019-04-03	2019		210.68	0.00	0.00	0.00	3.00	73.96	6.03		1.62		
2019-04-04	2019		102.14	0.00	0.00	0.00	-0.44	82.60	6.89		0.91		
2019-04-05	2019		198.24	0.10	0.00	0.00	3.20	71.20	8.71		1.69		
2019-04-06	2019		59.10	0.00	0.00	0.00	2.87	84.65	6.95		0.85		
2019-04-07	2019		243.10	0.10	0.00	0.00	4.57	68.28	7.00		2.04		
2019-04-08	2019		245.80	0.00	2.24	0.00	7.24	48.39	9.94		2.87		
2019-04-09	2019		214.52	0.10	1.80	0.00	6.80	51.71	5.81		2.35		
2019-04-10	2019		163.40	0.00	2.54	0.00	7.54	62.32	7.45		2.10		
2019-04-11	2019		147.89	0.10	0.18	0.00	5.18	68.93	6.23		1.67		
2019-04-12	2019		166.06	0.30	0.00	0.00	3.73	71.90	5.80		1.61		
2019-04-13	2019		231.62	0.00	0.24	0.00	5.24	53.79	5.35		2.29		
2019-04-14	2019		175.69	0.20	0.00	0.00	4.38	71.25	11.33		1.83		
2019-04-15	2019		125.90	0.00	0.00	0.00	3.60	79.32	8.70		1.34		
2019-04-16	2019		232.58	0.10	0.00	0.00	4.63	64.90	5.82		2.15		
2019-04-17	2019		225.65	0.00	1.16	0.00	6.16	54.75	9.55		2.61		
2019-04-18	2019		135.95	0.00	3.61	0.00	8.61	44.63	5.92		2.36		
2019-04-19	2019		193.83	0.00	4.00	0.00	9.00	50.43	12.45		3.11		
2019-04-20	2019		238.45	0.00	0.43	0.00	5.43	46.98	12.60		2.96		
2019-04-21	2019		241.03	0.00	0.33	0.00	5.33	47.08	5.17		2.53		
2019-04-22	2019		204.25	0.00	3.48	0.00	8.48	49.81	7.10		2.77	0.07	
2019-04-23	2019		266.28	0.00	4.86	0.00	9.86	43.65	11.70		3.78	0.14	
2019-04-24	2019		182.41	0.00	0.00	0.00	4.68	39.11	13.32		2.95	0.22	
2019-04-25	2019		265.38	0.00	0.00	0.00	4.54	32.11	12.82		3.42	0.29	

2019-04-26	2019		220.15	0.00	0.76	0.00	5.76	34.50	5.71		2.75	0.36	
2019-04-27	2019		112.57	0.00	0.00	0.00	3.34	42.07	11.47		2.33	0.43	
2019-04-28	2019		202.98	0.00	0.00	0.00	-1.53	71.49	5.66		1.54	0.50	
2019-04-29	2019		219.45	0.00	0.00	0.00	1.15	57.71	7.59		2.06	0.58	
2019-04-30	2019		166.88	1.00	0.00	0.00	-0.90	61.40	8.72		1.63	0.65	
2019-05-01	2019		176.92	1.20	0.00	0.00	0.89	65.15	7.61		1.73	0.72	
2019-05-02	2019		183.99	1.00	0.00	0.00	1.55	78.78	5.65		1.59	0.79	
2019-05-03	2019		113.77	0.20	0.00	0.00	1.61	66.44	13.33		1.61	0.86	
2019-05-04	2019		287.57	0.10	0.00	0.00	0.60	51.40	8.92		2.46	0.94	
2019-05-05	2019		241.51	0.10	0.00	0.00	2.90	47.50	6.05		2.48	1.01	
2019-05-06	2019		190.89	0.00	2.48	2.48	7.48	51.59	5.88		2.58	1.08	
2019-05-07	2019		179.28	0.00	2.43	4.91	7.43	60.34	4.73		2.29	1.15	
2019-05-08	2019		211.38	2.30	3.18	8.08	8.18	68.50	4.92		2.46	1.22	
2019-05-09	2019		236.32	0.10	6.58	14.67	11.58	59.32	7.66		3.28	1.30	
2019-05-10	2019		249.89	0.00	7.74	22.40	12.74	42.23	14.13		4.57	1.37	
2019-05-11	2019		301.86	0.00	8.64	31.04	13.64	37.07	5.16		4.21	1.44	
2019-05-12	2019		320.15	0.10	12.54	43.58	17.54	37.19	13.15		6.03	1.51	
2019-05-13	2019		307.10	0.10	5.83	49.40	10.83	44.78	7.46		4.02	1.58	
2019-05-14	2019		169.97	0.80	5.06	54.47	10.06	58.39	5.88		2.60	1.66	
2019-05-15	2019		54.67	8.00	3.23	57.69	8.23	88.86	6.18		1.01	1.73	
2019-05-16	2019		209.41	0.20	4.00	61.70	9.00	60.35	8.92		2.89	1.80	
2019-05-17	2019		298.32	0.00	7.14	68.83	12.14	33.58	12.94		5.03	1.87	
2019-05-18	2019		268.58	0.00	5.50	74.33	10.50	49.81	9.93		3.81	1.94	
2019-05-19	2019		339.46	0.00	5.33	79.66	10.33	43.90	10.42		4.44	2.02	
2019-05-20	2019		322.84	0.00	6.59	86.25	11.59	40.02	10.80		4.69	2.09	
2019-05-21	2019		272.00	0.00	7.27	93.52	12.27	44.76	7.80		4.08	2.16	
2019-05-22	2019		238.62	0.00	8.70	102.22	13.70	48.56	3.72		3.47	2.23	
2019-05-23	2019		112.44	0.00	10.44	112.66	15.44	48.17	5.23		2.78	2.30	
2019-05-24	2019		65.21	36.50	6.27	118.93	11.27	87.74	6.30		1.25	2.38	
2019-05-25	2019		279.94	0.20	6.29	125.22	11.29	72.79	4.47		3.33	2.45	

2019-05-26	2019		328.87	0.00	7.30	132.51	12.30	65.73	3.79		3.95	2.52	
2019-05-27	2019		316.25	0.00	10.31	142.82	15.31	49.49	5.03		4.50	2.59	
2019-05-28	2019		329.11	0.00	12.67	155.49	17.67	49.16	4.85		4.91	2.66	
2019-05-29	2019		323.31	0.00	16.01	171.50	21.01	36.53	6.39		5.77	2.74	
2019-05-30	2019		96.96	0.00	9.78	181.28	14.78	55.92	6.26		2.56	2.81	
2019-05-31	2019		235.80	0.00	8.07	189.35	13.07	67.08	4.32		3.23	2.88	
2019-06-01	2019		268.00	0.60	12.78	202.13	17.78	57.27	6.49		4.39	2.95	
2019-06-02	2019		205.68	0.00	11.95	214.08	16.95	52.15	6.28		3.82	3.02	
2019-06-03	2019		255.33	0.00	9.12	223.20	14.12	58.52	10.27		4.04	3.10	
2019-06-04	2019		168.47	5.90	6.85	230.05	11.85	62.94	6.71		2.77	3.17	
2019-06-05	2019		242.61	1.10	7.30	237.35	12.30	66.19	5.08		3.28	3.24	
2019-06-06	2019		99.30	8.70	4.69	242.04	9.69	89.81	8.04	487.90	1.40	3.31	
2019-06-07	2019		49.51	20.00	0.35	242.39	5.35	91.15	11.43		0.84	3.38	
2019-06-08	2019		244.63	4.40	2.52	244.91	7.52	76.56	6.41	1282.96	2.63	3.46	
2019-06-09	2019		247.44	0.00	4.58	249.49	9.58	79.55	6.06		2.81	3.53	
2019-06-10	2019		227.15	1.40	7.55	257.04	12.55	70.02	6.51		3.15	3.60	
2019-06-11	2019		315.11	0.00	10.74	267.78	15.74	64.26	7.74		4.48	3.63	
2019-06-12	2019		328.96	0.20	15.40	283.18	20.40	58.15	6.67		5.38	3.66	
2019-06-13	2019		260.68	1.50	14.65	297.83	19.65	66.68	7.89		4.43	3.69	
2019-06-14	2019		237.87	0.20	10.33	308.15	15.33	72.56	8.07		3.52	3.72	
2019-06-15	2019		298.05	0.00	10.91	319.07	15.91	71.40	7.84		4.17	3.75	
2019-06-16	2019		333.03	0.00	11.13	330.20	16.13	68.62	3.65		4.51	3.77	
2019-06-17	2019		332.45	0.00	13.10	343.30	18.10	61.13	7.26		5.05	3.80	
2019-06-18	2019		228.32	0.40	12.21	355.51	17.21	63.44	7.70	28.37	3.91	3.83	
2019-06-19	2019	0.07	42.60	27.20	4.33	359.85	9.33	93.63	12.03	27.60	0.84	3.86	0.25
2019-06-20	2019	0.14	113.95	21.90	6.22	366.07	11.22	90.45	7.07	28.67	1.60	3.89	0.53
2019-06-21	2019	0.27	186.72	0.00	8.66	374.73	13.66	85.59	12.20	29.11	2.46	3.92	1.04
2019-06-22	2019	0.31	277.08	0.00	8.70	383.42	13.70	81.28	9.30	29.00	3.40	3.95	1.24
2019-06-23	2019	0.34	291.30	0.00	9.45	392.87	14.45	76.07	7.39	28.84	3.79	3.98	1.36
2019-06-24	2019	0.10	124.35	5.00	7.50	400.37	12.50	89.14	10.13	28.81	1.76	4.01	0.39

2019-06-25	2019	0.25	201.54	4.60	8.70	409.06	13.70	87.58	6.52	28.89	2.61	4.04	1.03
2019-06-26	2019	0.25	204.17	3.80	8.53	417.59	13.53	86.81	4.34	28.82	2.69	4.07	1.02
2019-06-27	2019	0.25	185.98	1.50	9.20	426.78	14.20	84.37	4.21	28.72	2.61	4.09	1.02
2019-06-28	2019	0.25	199.16	19.50	10.36	437.15	15.36	82.62	6.01	29.16	2.86	4.12	1.02
2019-06-29	2019	0.27	243.53	6.40	7.69	444.83	12.69	83.05	7.44	29.43	2.99	4.15	1.11
2019-06-30	2019	0.36	324.35	0.00	11.95	456.79	16.95	68.28	8.95	29.43	4.66	4.18	1.52
2019-07-01	2019	0.17	130.30	6.80	6.99	463.77	11.99	77.40	9.56	29.36	2.18	4.21	0.72
2019-07-02	2019	0.31	207.66	0.00	7.50	471.28	12.50	73.29	10.58	29.37	2.98	4.24	1.30
2019-07-03	2019	0.32	234.74	0.40	7.65	478.93	12.65	80.14	5.15	29.22	3.00	4.27	1.37
2019-07-04	2019	0.30	264.73	0.10	7.85	486.78	12.85	78.72	4.30	29.05	3.32	4.30	1.28
2019-07-05	2019	0.29	172.76	0.10	8.41	495.19	13.41	84.85	3.85	28.88	2.41	4.33	1.25
2019-07-06	2019	0.26	135.56	1.70	10.18	505.37	15.18	88.65	4.04	28.74	2.08	4.36	1.14
2019-07-07	2019	0.19	137.62	2.90	10.53	515.91	15.53	91.98	5.78	28.64	2.02	4.39	0.85
2019-07-08	2019	0.34	263.35	4.20	10.62	526.53	15.62	80.77	5.07	28.64	3.54	4.41	1.48
2019-07-09	2019	0.26	142.00	0.10	8.39	534.92	13.39	85.57	5.38	28.51	2.09	4.44	1.15
2019-07-10	2019	0.28	136.18	0.00	9.30	544.22	14.30	89.79	4.55	28.39	2.00	4.47	1.26
2019-07-11	2019	0.32	192.52	1.90	10.59	554.81	15.59	87.14	5.20	28.29	2.69	4.50	1.45
2019-07-12	2019	0.44	323.86	0.10	14.45	569.26	19.45	65.78	6.77	28.11	4.96	4.53	1.98
2019-07-13	2019	0.37	285.85	2.00	13.98	583.24	18.98	74.14	5.07	27.88	4.26	4.56	1.70
2019-07-14	2019	0.38	259.82	2.60	13.45	596.69	18.45	74.02	5.90	27.70	3.94	4.59	1.77
2019-07-15	2019	0.35	236.28	0.00	11.30	607.99	16.30	81.08	5.67	27.54	3.31	4.62	1.60
2019-07-16	2019	0.32	228.23	0.60	10.16	618.15	15.16	83.66	4.63	27.41	3.07	4.65	1.51
2019-07-17	2019	0.33	251.38	23.50	10.45	628.60	15.45	84.10	6.06	27.31	3.29	4.68	1.54
2019-07-18	2019	0.22	103.43	3.10	8.78	637.37	13.78	88.63	8.66	27.86	1.66	4.69	1.01
2019-07-19	2019	0.20	157.60	22.60	9.33	646.70	14.33	92.45	9.75	28.61	2.00	4.70	0.96
2019-07-20	2019	0.34	286.08	1.50	12.04	658.74	17.04	83.63	6.09	29.14	3.80	4.71	1.61
2019-07-21	2019	0.39	310.89	0.00	13.10	671.85	18.10	77.71	6.38	28.89	4.30	4.72	1.83
2019-07-22	2019	0.44	300.62	0.00	15.08	686.92	20.08	70.78	8.07	28.66	4.67	4.74	2.10
2019-07-23	2019	0.38	282.27	0.20	16.24	703.16	21.24	81.16	4.28	28.39	4.30	4.75	1.80
2019-07-24	2019	0.26	130.80	2.80	13.17	716.33	18.17	86.13	12.02	28.23	2.28	4.76	1.22

2019-07-25	2019	0.34	197.10	1.10	10.58	726.90	15.58	73.77	18.13	28.19	3.31	4.77	1.61
2019-07-26	2019	0.44	312.08	0.00	14.65	741.56	19.65	59.31	6.62	28.04	4.91	4.78	2.12
2019-07-27	2019	0.19	117.45	19.90	10.85	752.40	15.85	88.55	8.71	28.03	1.88	4.80	0.93
2019-07-28	2019	0.30	212.62	2.80	10.88	763.28	15.88	85.84	9.93	28.94	2.81	4.81	1.44
2019-07-29	2019	0.33	228.46	6.20	11.73	775.01	16.73	82.51	4.82	29.42	3.17	4.82	1.57
2019-07-30	2019	0.29	168.82	0.20	11.23	786.25	16.23	89.45	4.83	29.47	2.39	4.83	1.40
2019-07-31	2019	0.33	248.15	0.40	11.40	797.65	16.40	84.88	5.06	29.35	3.27	4.84	1.58
2019-08-01	2019	0.36	238.43	8.70	13.06	810.71	18.06	88.03	5.34	29.49	3.26	4.85	1.73
2019-08-02	2019	0.34	232.33	3.10	15.05	825.77	20.05	87.19	5.65	29.35	3.39	4.87	1.63
2019-08-03	2019	0.32	238.60	0.00	11.23	837.00	16.23	83.21	9.03	29.22	3.13	4.88	1.54
2019-08-04	2019	0.39	272.49	0.00	12.57	849.57	17.57	73.80	7.49	29.03	3.86	4.89	1.92
2019-08-05	2019	0.37	237.58	1.90	13.49	863.06	18.49	78.42	7.16	28.80	3.49	4.90	1.81
2019-08-06	2019	0.35	214.10	0.00	10.10	873.15	15.10	81.40	6.90	28.77	2.85	4.91	1.74
2019-08-07	2019	0.38	275.28	0.00	10.57	883.72	15.57	78.73	3.95	28.60	3.49	4.92	1.87
2019-08-08	2019	0.39	227.58	1.20	14.04	897.76	19.04	80.15	5.05	28.40	3.34	4.94	1.94
2019-08-09	2019	0.27	149.40	2.20	8.48	906.24	13.48	85.52	9.11	28.25	2.05	4.95	1.34
2019-08-10	2019	0.38	174.41	0.00	7.95	914.19	12.95	79.94	4.30	28.14	2.31	4.96	1.86
2019-08-11	2019	0.29	68.06	0.10	8.61	922.80	13.61	85.38	4.68	28.00	1.34	4.97	1.45
2019-08-12	2019	0.29	101.43	0.20	9.70	932.50	14.70	86.60	3.24	27.90	1.63	4.98	1.42
2019-08-13	2019	0.36	192.76	3.50	10.60	943.10	15.60	84.39	6.19	27.80	2.57	5.00	1.81
2019-08-14	2019	0.44	266.96	0.50	11.63	954.72	16.63	73.47	5.64	27.64	3.54	5.01	2.22
2019-08-15	2019	0.42	211.66	2.00	13.68	968.41	18.68	72.94	7.78	27.45	3.35	5.02	2.10
2019-08-16	2019	0.34	150.74	0.00	7.76	976.17	12.76	82.98	14.53	27.30	2.09	5.03	1.73
2019-08-17	2019	0.37	226.70	0.70	5.50	981.67	10.50	78.98	7.06	27.19	2.48	5.04	1.88
2019-08-18	2019	0.25	124.89	1.50	6.07	987.74	11.07	87.23	3.77	27.10	1.62	5.05	1.28
2019-08-19	2019	0.26	149.44	1.60	7.13	994.87	12.13	91.01	3.55	27.03	1.82	5.07	1.31
2019-08-20	2019	0.48	258.33	0.10	10.05	1004.92	15.05	79.20	5.98	26.95	3.11	5.08	2.45
2019-08-21	2019	0.55	240.32	1.00	14.44	1019.36	19.44	65.34	9.31	26.79	3.95	5.09	2.79
2019-08-22	2019	0.41	194.33	0.60	10.71	1030.07	15.71	70.43	8.42	26.63	2.95	5.10	2.08
2019-08-23	2019	0.35	121.40	2.10	8.50	1038.57	13.50	80.68	7.33	26.48	1.88	5.11	1.81

2019-08-24	2019	0.31	193.19	0.20	9.86	1048.43	14.86	84.32	4.70	26.41	2.41	5.13	1.56
2019-08-25	2019	0.43	249.46	0.90	9.11	1057.54	14.11	75.48	9.06	26.30	3.00	5.14	2.21
2019-08-26	2019	0.40	195.80	1.50	6.68	1064.21	11.68	78.19	11.00	26.15	2.35	5.15	2.05
2019-08-27	2019	0.40	184.81	0.10	7.57	1071.78	12.57	73.31	4.70	26.00	2.31	5.16	2.04
2019-08-28	2019	0.44	236.87	1.00	8.31	1080.09	13.31	73.25	11.03	25.85	2.90	5.17	2.28
2019-08-29	2019	0.40	198.02	0.00	5.62	1085.71	10.62	80.87	3.20	25.69	2.10	5.18	2.06
2019-08-30	2019	0.06	37.08	4.70	5.15	1090.86	10.15	98.82	2.38	25.62	0.72	5.20	0.31
2019-08-31	2019	0.14	80.16	0.90	5.18	1096.04	10.18	96.35	2.60	25.64	1.06	5.21	0.70
2019-09-01	2019	0.25	99.77	0.30	6.13	1102.17	11.13	93.00	4.43	25.63	1.25	5.22	1.29
2019-09-02	2019	0.38	217.67	2.80	9.40	1111.58	14.40	81.24	9.41	25.58	2.52	5.23	1.97
2019-09-03	2019	0.41	228.59	0.10	11.00	1122.58	16.00	74.10	4.33	25.48	2.77	5.24	2.14
2019-09-04	2019	0.36	165.04	0.00	11.16	1133.74	16.16	81.09	4.79	25.32	2.19	5.26	1.90
2019-09-05	2019	0.37	215.42	0.00	9.99	1143.73	14.99	74.86	7.50	25.36	2.66	5.27	1.96
2019-09-06	2019	0.36	118.80	0.00	8.66	1152.39	13.66	79.88	4.33	25.34	1.68	5.28	1.88
2019-09-07	2019	0.38	162.63	0.10	10.43	1162.82	15.43	82.14	5.28	25.26	2.07	5.29	2.03
2019-09-08	2019	0.10	24.32	4.80	5.80	1168.62	10.80	98.86	7.70	25.19	0.54	5.30	0.53
2019-09-09	2019	0.06	40.22	2.10	5.23	1173.85	10.23	99.34	6.44	25.28	0.63	5.31	0.30
2019-09-10	2019	0.12	63.90	1.70	4.05	1177.89	9.05	97.64	4.86	25.31	0.80	5.33	0.65
2019-09-11	2019	0.25	100.02	0.10	5.03	1182.92	10.03	91.40	5.64	25.34	1.14	5.34	1.32
2019-09-12	2019	0.40	204.25	0.00	7.63	1190.55	12.63	83.79	5.21	25.29	2.02	5.35	2.16
2019-09-13	2019	0.32	149.12	0.40	9.63	1200.19	14.63	76.50	5.30	25.16	1.94	5.36	1.73
2019-09-14	2019	0.29	130.00	0.10	7.60	1207.79	12.60	83.43	3.33	25.04	1.51	5.37	1.57
2019-09-15	2019	0.39	194.46	0.10	8.63	1216.42	13.63	81.06	3.53	24.89	1.98	5.39	2.10
2019-09-16	2019	0.28	128.01	1.60	8.32	1224.74	13.32	86.17	5.58	24.72	1.51	5.40	1.51
2019-09-17	2019	0.27	148.28	0.20	6.05	1230.79	11.05	84.71	3.75	24.63	1.48	5.41	1.48
2019-09-18	2019	0.28	161.66	0.00	4.77	1235.56	9.77	78.52	3.13	24.55	1.51	5.42	1.54
2019-09-19	2019	0.33	180.25	0.70	6.28	1241.84	11.28	77.55	5.31	24.42	1.75	5.43	1.77
2019-09-20	2019	0.37	159.74	0.20	7.32	1249.16	12.32	75.57	8.98	24.27	1.89	5.44	2.02
2019-09-21	2019		143.16	0.00	6.25	1255.40	11.25	77.38	5.28	24.13	1.55	5.46	
2019-09-22	2019		172.99	0.00	8.72	1264.12	13.72	72.68	3.13	23.99	1.75	5.47	

2019-09-23	2019		134.35	0.70	6.43	1270.55	11.43	68.63	10.31	23.87	1.96	5.05	
2019-09-24	2019		127.35	0.10	5.45	1276.00	10.45	69.05	10.58	23.79	1.85	4.63	
2019-09-25	2019		114.70	0.00	5.20	1281.20	10.20	71.08	10.48	23.73	1.71	4.21	
2019-09-26	2019		61.78	9.70	1.76	1282.96	6.76	97.40	7.38	23.84	0.60	3.79	
2019-09-27	2019		41.19	0.20	0.00	1282.96	0.75	88.39	6.93	24.33	0.57	3.36	
2019-09-28	2019		66.10	0.20	0.00	1282.96	1.25	83.27	3.72	24.34	0.67	2.94	
2019-09-29	2019		68.65	0.00	0.00	1282.96	0.80	70.73	4.68	24.43	0.82	2.52	
2019-09-30	2019		74.11	0.00	0.00	1282.96	0.69	85.59	4.28	24.47	0.64	2.10	
2019-10-01	2019		160.03	0.00	0.00	1282.96	1.70	77.21	7.04	24.49	0.97	1.68	
2019-10-02	2019		109.90	0.00	0.00	1282.96	4.31	70.18	5.30	24.50	1.03	1.26	
2019-10-03	2019		156.97	0.10	0.00	1282.96	3.41	74.20	5.04	24.51	0.98	0.84	
2019-10-04	2019		63.08	0.40	0.80	1283.75	5.80	89.76	5.86	24.53	0.67	0.42	
2019-10-05	2019		95.15	0.40	3.66	1287.42	8.66	67.95	10.76	24.55	1.54		
2019-10-06	2019		139.69	0.10	4.79	1292.21	9.79	51.74	8.59	24.56	1.91		
2019-10-07	2019		90.31	3.80	2.55	1294.75	7.55	63.76	8.97	24.56	1.44		
2019-10-08	2019		88.31	0.00	0.00	1294.75	-1.38	69.29	13.35	24.65	0.96		
2019-10-09	2019		124.60	0.00	0.00	1294.75	-1.84	57.44	7.24	24.67	0.94		
2019-10-10	2019		136.09	0.00	0.00	1294.75	-1.07	66.40	5.81	24.65	0.77		
2019-10-11	2019		132.83	0.00	0.00	1294.75	-0.03	72.04	3.43	24.62	0.62		
2019-10-12	2019		110.94	0.00	0.00	1294.75	2.86	67.34	4.45	24.64	0.78		
2019-10-13	2019		29.51	3.90	0.18	1294.94	5.18	92.10	5.01	24.70	0.50		
2019-10-14	2019		26.58	7.90	0.00	1294.94	2.20	99.61	8.35	25.22	0.30		
2019-10-15	2019		47.60	0.50	0.00	1294.94	2.66	91.07	8.83	25.32	0.48		
2019-10-16	2019		101.41	0.00	1.91	1296.85	6.91	74.15	5.59	25.29	0.81		
2019-10-17	2019		89.49	0.00	1.94	1298.79	6.94	79.10	5.23	25.27	0.70		
2019-10-18	2019		79.17	0.00	0.00	1298.79	4.23	76.32	4.41	25.24	0.62		
2019-10-19	2019		112.12	0.20	0.00	1298.79	2.75	68.63	7.04	25.22	0.76		
2019-10-20	2019		99.01	0.10	0.00	1298.79	1.78	85.14	6.49	25.21	0.45		
2019-10-21	2019		41.38	0.00	0.00	1298.79	-0.32	87.65	3.73	25.20	0.38		
2019-10-22	2019		52.70	0.60	0.00	1298.79	0.85	92.43	7.00	25.21	0.35		

2019-10-23	2019		94.03	0.10	0.00	1298.79	2.17	73.95	12.74	25.32	0.81		
2019-10-24	2019		76.91	0.00	1.81	1300.60	6.81	58.26	7.08	25.33	1.08		
2019-10-25	2019		37.45	0.80	0.00	1300.60	4.06	88.50	11.48	25.36	0.53		
2019-10-26	2019		69.63	0.10	0.00	1300.60	-3.58	74.30	14.75	25.38	0.63		
2019-10-27	2019		60.10	0.30	0.00	1300.60	-3.44	78.03	11.22	25.25	0.51		
2019-10-28	2019		47.55	0.10	0.00	1300.60	-7.89	69.60	16.02	25.10	0.60		
2019-10-29	2019		97.13	0.00	0.00	1300.60	-8.45	65.28	5.91	24.87	0.31		
2019-10-30	2019		42.74	0.00	0.00	1300.60	0.07	56.71	7.69	24.73	0.90		
2019-10-31	2019		36.22	0.00	0.00	1300.60	2.28	74.20	12.48	24.89	0.84		
2019-11-01	2019		65.27	0.00	0.00	1300.60	1.42	71.39	8.98	24.95	0.64		
2019-11-02	2019		46.39	0.40	0.00	1300.60	3.56	92.91	7.68	25.04	0.28		
2019-11-03	2019		36.23	0.10	0.00	1300.60	-1.83	94.10	6.97	25.19	0.21		
2019-11-04	2019		21.24	0.40	0.00	1300.60	-2.64	89.96	3.63	25.13	0.28		
2019-11-05	2019		73.36	1.40	0.00	1300.60	-8.20	86.74	8.07	25.10	0.13		
2019-11-06	2019		77.04	0.00	0.00	1300.60	-13.46	85.60	4.08	24.88	0.04		
2019-11-07	2019		46.70	0.00	0.00	1300.60	-6.71	82.85	4.06	24.66	0.17		
2019-11-08	2019		24.43	5.40	0.00	1300.60	2.65	98.49	6.54	24.91	0.20		
2019-11-09	2019		33.75	6.60	0.00	1300.60	-9.35	91.04	8.57	25.25	0.16		
2019-11-10	2019		55.46	0.80	0.00	1300.60	-15.87	85.66	5.23	25.22	0.07		
2019-11-11	2019		65.14	0.00	0.00	1300.60	-14.28	84.02	3.87	25.09	0.03		
2019-11-12	2019		30.58	0.00	0.00	1300.60	-1.93	93.33	3.90	25.01	0.15		
2019-11-13	2019		59.75	0.10	0.00	1300.60	1.66	87.33	4.52	25.04	0.03		
2019-11-14	2019		24.76	0.10	0.00	1300.60	-0.85	97.85	5.61	25.06	0.14		
2019-11-15	2019		26.14	1.70	0.00	1300.60	-1.25	96.97	4.94	25.09	0.13		
2019-11-16	2019		54.48	0.00	0.00	1300.60	2.79	82.28	8.38	25.20	0.24		
2019-11-17	2019		57.73	0.00	1.26	1301.86	6.26	64.38	6.57	25.26	0.47		
2019-11-18	2019		52.97	0.20	0.00	1301.86	4.20	64.68	11.42	25.40	0.81		
2019-11-19	2019		21.72	2.70	0.00	1301.86	-1.11	98.53	2.02	25.48	0.13		
2019-11-20	2019		69.28	0.20	0.00	1301.86	-2.80	95.08	3.18	25.48	-0.28		
2019-11-21	2019		57.54	0.00	0.00	1301.86	-0.98	82.05	4.63	25.37	-0.05		

2019-11-22	2019		48.33	0.00	0.00	1301.86	3.23	71.25	6.12	25.20	0.27		
2019-11-23	2019		53.55	0.00	1.31	1303.17	6.31	56.18	7.70	25.20	0.66		
2019-11-24	2019		30.00	0.40	0.00	1303.17	1.36	90.49	9.39	25.26	0.19		
2019-11-25	2019		34.45	0.00	0.00	1303.17	-0.83	81.93	10.90	25.28	0.32		
2019-11-26	2019		18.53	2.30	0.00	1303.17	-7.70	89.00	7.45	25.02	0.18		
2019-11-27	2019		38.38	0.40	0.00	1303.17	-13.13	91.78	6.23	24.61	0.00		
2019-11-28	2019		42.04	0.00	0.00	1303.17	-10.74	88.59	4.40	24.41	-0.04		
2019-11-29	2019		23.78	0.10	0.00	1303.17	-10.51	90.55	4.45	24.31	0.07		
2019-11-30	2019		43.82	0.50	0.00	1303.17	-14.20	88.97	4.22	24.01	-0.05		
2019-12-01	2019		46.37	0.00	0.00	1303.17	-13.72	83.97	2.89	23.55	-0.09		
2019-12-02	2019		34.75	0.00	0.00	1303.17	-3.81	72.06	5.42	23.42	0.18		
2019-12-03	2019		28.92	0.00	0.00	1303.17	1.54	62.27	8.26	23.44	0.65		
2019-12-04	2019		4.01	3.60	0.00	1303.17	-2.93	96.60	2.83	23.43	0.26		
2019-12-05	2019		29.40	0.20	0.00	1303.17	-9.73	87.55	2.87	23.44	-0.01		
2019-12-06	2019		30.36	0.00	0.00	1303.17	-10.39	83.67	2.53	23.32	-0.01		
2019-12-07	2019		19.44	0.20	0.00	1303.17	-8.80	80.75	5.90	23.31	0.19		
2019-12-08	2019		35.70	0.00	0.00	1303.17	-10.78	75.23	6.59	23.24	0.10		
2019-12-09	2019		25.38	0.00	0.00	1303.17	-11.06	73.33	6.18	23.23	0.18		
2019-12-10	2019		25.40	0.70	0.00	1303.17	-11.01	80.24	4.60	23.14	0.09		
2019-12-11	2019		18.33	3.10	0.00	1303.17	-13.69	79.28	6.31	23.07	0.16		
2019-12-12	2019		12.03	0.40	0.00	1303.17	-13.67	78.94	5.64	23.03	0.19		
2019-12-13	2019		26.55	1.50	0.00	1303.17	-17.32	79.88	4.27	22.94	0.05		
2019-12-14	2019		25.79	0.00	0.00	1303.17	-11.46	80.71	5.39	22.75	0.09		
2019-12-15	2019		19.28	0.00	0.00	1303.17	-8.69	79.55	5.76	22.54	0.18		
2019-12-16	2019		28.98	0.20	0.00	1303.17	-6.74	72.56	6.35	22.38	0.18		
2019-12-17	2019		23.16	0.00	0.00	1303.17	-2.57	70.43	4.11	22.22	0.21		
2019-12-18	2019		27.64	0.10	0.00	1303.17	-4.84	72.21	5.66	22.16	0.19		
2019-12-19	2019		15.48	0.00	0.00	1303.17	-7.99	86.34	4.30	22.06	0.14		
2019-12-20	2019		17.96	0.10	0.00	1303.17	-9.38	86.28	3.35	21.98	0.09		
2019-12-21	2019		16.89	1.80	0.00	1303.17	-7.41	90.95	4.00	21.92	0.09		

2019-12-22	2019		38.84	0.30	0.00	1303.17	-7.58	88.92	4.33	21.84	-0.14		
2019-12-23	2019		16.53	0.10	0.00	1303.17	-8.44	89.89	3.07	21.76	0.09		
2019-12-24	2019		10.73	0.10	0.00	1303.17	-12.62	89.38	3.21	21.70	0.12		
2019-12-25	2019		33.30	0.10	0.00	1303.17	-7.00	79.72	5.66	21.64	0.04		
2019-12-26	2019		42.28	0.10	0.00	1303.17	-9.96	64.82	4.39	21.58	0.00		
2019-12-27	2019		30.58	0.00	0.00	1303.17	-6.54	64.11	6.28	21.44	0.25		
2019-12-28	2019		43.10	0.00	0.00	1303.17	-7.25	64.53	5.88	21.34	0.09		
2019-12-29	2019		38.64	0.00	0.00	1303.17	-6.14	73.00	3.28	21.28	-0.07		
2019-12-30	2019		39.82	0.00	0.00	1303.17	-9.48	81.32	3.33	21.24	-0.10		
2019-12-31	2019		26.65	0.00	0.00	1303.17	-0.87	72.59	4.47	21.21	0.20		
2020-01-01	2020		41.98	0.00	0.00	0.00	-5.29	88.14	2.88	21.22	-0.20		
2020-01-02	2020		27.60	0.40	0.00	0.00	-2.10	62.60	14.07	21.19	0.78		
2020-01-03	2020		26.61	0.20	0.00	0.00	-7.12	69.38	5.30	21.18	0.22		
2020-01-04	2020		22.43	0.10	0.00	0.00	-4.18	74.78	8.34	21.15	0.36		
2020-01-05	2020		43.95	0.00	0.00	0.00	-5.01	61.93	5.94	21.07	0.17		
2020-01-06	2020		43.95	0.10	0.00	0.00	-9.56	63.50	6.26	20.90	0.15		
2020-01-07	2020		25.53	1.10	0.00	0.00	-14.05	79.93	4.35	20.61	0.09		
2020-01-08	2020		30.43	5.70	0.00	0.00	-15.49	83.14	8.68	20.31	0.10		
2020-01-09	2020		45.02	0.40	0.00	0.00	-23.00	74.96	8.32	20.20	0.06		
2020-01-10	2020		34.38	0.00	0.00	0.00	-24.30	74.96	3.86	20.12	0.04		
2020-01-11	2020		39.31	0.90	0.00	0.00	-20.47	76.73	8.99	20.04	0.09		
2020-01-12	2020		32.14	1.20	0.00	0.00	-25.93	59.85	12.82	19.98	0.16		
2020-01-13	2020		28.74	0.90	0.00	0.00	-28.13	65.01	5.77	19.90	0.08		
2020-01-14	2020		52.83	0.10	0.00	0.00	-36.25	57.90	3.41	19.79	0.02		
2020-01-15	2020		51.69	0.00	0.00	0.00	-38.00	55.82	2.48	19.63	0.01		
2020-01-16	2020		29.15	3.40	0.00	0.00	-28.92	63.80	4.24	19.47	0.06		
2020-01-17	2020		46.65	0.10	0.00	0.00	-26.46	62.01	11.04	19.41	0.12		
2020-01-18	2020		51.57	0.00	0.00	0.00	-27.04	64.88	5.08	19.39	0.05		
2020-01-19	2020		42.68	0.00	0.00	0.00	-21.54	67.44	3.96	19.38	0.07		
2020-01-20	2020		22.95	0.00	0.00	0.00	-14.44	80.48	2.75	19.37	0.12		

2020-01-21	2020		56.79	0.00	0.00	0.00	-8.85	83.42	2.60	19.38	-0.07		
2020-01-22	2020		28.70	7.90	0.00	0.00	-5.63	90.66	4.35	19.39	0.12		
2020-01-23	2020		40.97	0.00	0.00	0.00	-8.53	80.13	6.43	19.42	0.17		
2020-01-24	2020		35.38	0.00	0.00	0.00	-6.73	88.87	3.39	19.45	0.09		
2020-01-25	2020		61.83	0.00	0.00	0.00	-8.94	88.51	2.55	19.47	-0.06		
2020-01-26	2020		59.56	0.00	0.00	0.00	-10.38	86.48	4.15	19.48	0.01		
2020-01-27	2020		53.14	0.00	0.00	0.00	-7.00	94.79	4.03	19.49	-0.01		
2020-01-28	2020		39.18	0.10	0.00	0.00	-14.64	91.66	2.57	19.52	0.06		
2020-01-29	2020		46.15	0.00	0.00	0.00	-9.69	77.22	6.07	19.53	0.20		
2020-01-30	2020		65.60	0.00	0.00	0.00	-0.06	60.11	7.09	19.52	0.53		
2020-01-31	2020		52.45	0.00	0.00	0.00	1.74	56.79	7.45	19.54	0.77		
2020-02-01	2020		27.10	3.10	0.00	0.00	0.63	67.15	9.88	19.58	0.83		
2020-02-02	2020		71.96	0.10	0.00	0.00	-5.13	57.44	11.11	19.66	0.65		
2020-02-03	2020		66.52	0.10	0.00	0.00	-15.43	84.59	4.50	19.64	0.07		
2020-02-04	2020		58.45	0.60	0.00	0.00	-9.51	81.10	5.04	19.55	0.16		
2020-02-05	2020		49.88	3.70	0.00	0.00	-1.73	90.38	3.94	19.49	0.17		
2020-02-06	2020		50.80	1.50	0.00	0.00	0.12	85.79	10.30	19.52	0.38		
2020-02-07	2020		75.50	0.30	0.00	0.00	-3.45	73.00	7.35	19.57	0.38		
2020-02-08	2020		84.13	0.00	0.00	0.00	-10.63	83.51	5.35	19.61	0.13		
2020-02-09	2020		56.75	0.00	0.00	0.00	-2.93	70.03	14.09	19.60	0.72		
2020-02-10	2020		87.30	0.00	0.00	0.00	-1.23	60.63	9.78	19.58	0.75		
2020-02-11	2020		34.03	7.50	0.00	0.00	-4.15	85.72	7.79	19.61	0.35		
2020-02-12	2020		70.77	0.00	0.00	0.00	-20.05	77.96	4.04	19.63	0.12		
2020-02-13	2020		35.93	1.00	0.00	0.00	-8.72	84.04	7.42	19.63	0.29		
2020-02-14	2020		66.77	0.40	0.00	0.00	-10.34	82.55	6.94	19.61	0.25		
2020-02-15	2020		71.34	0.10	0.00	0.00	-14.25	83.79	4.41	19.61	0.17		
2020-02-16	2020		72.20	0.80	0.00	0.00	-11.26	86.40	5.31	19.62	0.20		
2020-02-17	2020		89.52	1.70	0.00	0.00	-20.17	74.38	7.81	19.62	0.18		
2020-02-18	2020		113.26	0.00	0.00	0.00	-28.12	62.78	2.77	19.59	0.10		
2020-02-19	2020		108.34	0.00	0.00	0.00	-12.73	68.12	5.40	19.54	0.30		

2020-02-20	2020		108.32	0.00	0.00	0.00	-4.23	55.95	5.30	19.51	0.59		
2020-02-21	2020		92.35	0.00	0.00	0.00	0.28	47.63	5.91	19.50	0.93		
2020-02-22	2020		96.22	0.10	0.00	0.00	-1.23	62.13	8.27	19.51	0.83		
2020-02-23	2020		111.77	0.30	0.00	0.00	-7.23	52.20	4.91	19.52	0.56		
2020-02-24	2020		126.49	0.00	0.00	0.00	-13.07	73.31	3.65	19.53	0.28		
2020-02-25	2020		111.23	0.00	0.00	0.00	-11.91	72.74	4.29	19.49	0.33		
2020-02-26	2020		103.21	0.00	0.00	0.00	-0.06	63.90	5.23	19.46	0.75		
2020-02-27	2020		119.86	0.00	0.00	0.00	3.14	52.68	6.88	19.48	1.16		
2020-02-28	2020		130.28	0.00	0.00	0.00	1.18	60.19	4.17	19.53	0.78		
2020-02-29	2020		51.88	1.20	0.00	0.00	-1.77	81.88	11.29	19.57	0.61		
2020-03-01	2020		126.43	0.00	0.00	0.00	-4.01	75.93	8.58	19.61	0.63		
2020-03-02	2020		134.92	0.00	0.00	0.00	2.15	57.25	12.50	19.65	1.45		
2020-03-03	2020		135.56	0.00	0.00	0.00	1.78	64.38	9.26	19.67	1.13		
2020-03-04	2020		92.04	0.20	0.00	0.00	-0.49	71.68	10.27	19.72	0.90		
2020-03-05	2020		123.09	0.00	0.00	0.00	-3.84	65.67	6.30	19.74	0.77		
2020-03-06	2020		124.89	0.20	0.00	0.00	-8.02	85.02	9.65	19.73	0.46		
2020-03-07	2020		82.04	3.40	0.00	0.00	-13.93	87.31	7.90	19.70	0.28		
2020-03-08	2020		165.99	1.00	0.00	0.00	-14.05	78.55	4.82	19.66	0.41		
2020-03-09	2020		166.70	0.00	0.00	0.00	-5.96	56.58	6.76	19.64	0.89		
2020-03-10	2020		138.81	0.00	0.00	0.00	-2.56	46.11	6.35	19.63	1.14		
2020-03-11	2020		98.25	0.00	0.00	0.00	-0.60	68.25	12.25	19.61	1.09		
2020-03-12	2020		120.43	0.00	0.00	0.00	-6.25	77.83	10.29	19.61	0.66		
2020-03-13	2020		165.18	0.20	0.00	0.00	-18.53	66.04	11.70	19.62	0.42		
2020-03-14	2020		137.06	1.40	0.00	0.00	-18.43	77.79	4.77	19.55	0.33		
2020-03-15	2020		159.19	0.00	0.00	0.00	-18.66	61.03	4.60	19.47	0.41		
2020-03-16	2020		183.06	0.00	0.00	0.00	-7.48	57.90	5.44	19.41	0.88		
2020-03-17	2020		171.81	0.00	0.00	0.00	-6.65	68.67	6.02	19.40	0.83		
2020-03-18	2020		170.39	0.00	0.00	0.00	-11.57	75.04	4.35	19.40	0.59		
2020-03-19	2020		188.15	0.00	0.00	0.00	-13.12	78.80	5.20	19.37	0.56		
2020-03-20	2020		195.86	0.00	0.00	0.00	-9.77	73.58	5.57	19.35	0.73		

2020-03-21	2020		197.79	0.00	0.00	0.00	-6.39	69.53	7.31	19.32	0.94		
2020-03-22	2020		176.31	0.00	0.00	0.00	-1.69	60.58	4.35	19.33	1.17		
2020-03-23	2020		113.31	3.60	0.00	0.00	-2.42	80.80	7.78	19.35	0.82		
2020-03-24	2020		173.90	1.70	0.00	0.00	-5.60	81.88	5.75	19.39	0.83		
2020-03-25	2020		208.23	0.50	0.00	0.00	-5.99	71.35	5.91	19.43	1.00		
2020-03-26	2020		150.21	0.00	0.00	0.00	-0.43	55.55	9.84	19.46	1.52		
2020-03-27	2020		175.30	0.00	0.00	0.00	1.44	65.40	6.34	19.48	1.44		
2020-03-28	2020		172.39	0.80	0.00	0.00	-7.55	78.12	10.99	19.55	0.80		
2020-03-29	2020		120.56	0.20	0.00	0.00	-6.05	81.25	7.21	19.59	0.72		
2020-03-30	2020		113.65	5.00	0.00	0.00	-10.01	84.86	8.58	19.60	0.53		
2020-03-31	2020		210.64	0.60	0.00	0.00	-13.40	79.74	12.69	19.58	0.60		
2020-04-01	2020		218.92	0.20	0.00	0.00	-16.38	75.25	10.69	19.58	0.56		
2020-04-02	2020		236.11	0.00	0.00	0.00	-18.03	68.61	4.77	19.57	0.60		
2020-04-03	2020		199.52	0.00	0.00	0.00	-14.34	67.60	4.91	19.52	0.69		
2020-04-04	2020		213.79	0.60	0.00	0.00	-10.12	77.35	5.07	19.49	0.86		
2020-04-05	2020		171.32	1.40	0.00	0.00	-9.58	85.94	6.92	19.47	0.70		
2020-04-06	2020		235.00	0.00	0.00	0.00	-6.52	78.96	5.90	19.48	1.09		
2020-04-07	2020		231.60	0.00	0.00	0.00	0.08	59.80	15.48	19.50	1.93		
2020-04-08	2020		245.94	0.00	0.00	0.00	-2.17	58.05	10.12	19.53	1.72		
2020-04-09	2020		145.88	0.00	0.00	0.00	2.70	56.20	7.59	19.57	1.77		
2020-04-10	2020		248.40	0.30	0.00	0.00	0.92	71.20	10.76	19.64	1.77		
2020-04-11	2020		252.07	0.00	0.00	0.00	-5.53	58.14	11.74	19.75	1.50		
2020-04-12	2020		242.22	0.60	0.00	0.00	-7.36	69.93	9.69	19.82	1.17		
2020-04-13	2020		256.00	0.00	0.00	0.00	-5.88	61.33	3.85	19.82	1.41		
2020-04-14	2020		150.63	0.00	0.00	0.00	2.38	75.63	8.72	19.83	1.45		
2020-04-15	2020		238.01	0.00	0.00	0.00	-0.06	70.42	9.25	19.96	1.72		
2020-04-16	2020		267.63	0.00	0.00	0.00	2.49	64.65	6.84	20.12	2.15		
2020-04-17	2020		202.16	0.00	1.46	1.46	6.46	68.62	12.01	20.55	2.25		
2020-04-18	2020		275.33	0.40	0.00	1.46	2.94	63.23	10.53	20.98	2.32		
2020-04-19	2020		205.50	0.10	2.16	3.62	7.16	55.06	9.47	22.02	2.65		

2020-04-20	2020		222.57	0.00	6.38	10.00	11.38	47.70	5.80	23.92	3.07		
2020-04-21	2020		263.06	0.00	6.76	16.77	11.76	45.17	12.10	24.68	4.02	0.12	
2020-04-22	2020		194.52	0.00	4.88	21.65	9.88	46.83	10.13	25.16	3.21	0.23	
2020-04-23	2020		223.32	0.00	3.93	25.57	8.93	45.66	11.49	25.36	3.38	0.35	
2020-04-24	2020		227.64	0.00	4.16	29.73	9.16	44.87	8.61	25.76	3.24	0.46	
2020-04-25	2020		210.24	0.00	6.13	35.87	11.13	37.32	8.42	26.35	3.57	0.58	
2020-04-26	2020		234.80	0.60	4.30	40.17	9.30	50.39	15.85	28.73	3.59	0.70	
2020-04-27	2020		186.22	0.40	4.07	44.24	9.07	54.33	6.91	32.83	2.67	0.81	
2020-04-28	2020		263.90	0.00	5.97	50.21	10.97	38.14	9.97	32.98	4.03	0.93	
2020-04-29	2020		241.43	0.00	8.01	58.22	13.01	37.53	7.12	32.84	3.86	1.04	
2020-04-30	2020		116.11	0.00	4.72	62.94	9.72	65.12	8.93	32.61	2.17	1.16	
2020-05-01	2020		230.38	0.00	3.81	66.75	8.81	58.25	12.90	32.44	3.12	1.28	
2020-05-02	2020		281.76	0.00	4.71	71.47	9.71	55.62	6.43	32.25	3.33	1.39	
2020-05-03	2020		157.82	7.00	6.58	78.05	11.58	55.47	11.17	31.95	3.08	1.51	
2020-05-04	2020		114.90	12.70	1.50	79.55	6.50	95.52	9.37	32.28	1.12	1.62	
2020-05-05	2020		275.50	0.00	5.31	84.86	10.31	65.82	6.22	32.21	3.18	1.74	
2020-05-06	2020		279.36	0.00	7.70	92.56	12.70	49.40	6.85	31.93	3.87	1.86	
2020-05-07	2020		193.94	0.30	8.49	101.05	13.49	46.71	7.67	31.61	3.52	1.97	
2020-05-08	2020		210.65	3.70	4.05	105.10	9.05	75.10	10.46	31.49	2.48	2.09	
2020-05-09	2020		216.88	0.00	1.03	106.13	6.03	66.84	8.45	31.37	2.42	2.20	
2020-05-10	2020		94.53	2.10	0.00	106.13	4.05	81.65	6.08	31.20	1.23	2.32	
2020-05-11	2020		143.21	0.00	1.68	107.80	6.68	51.47	7.00	31.06	2.34	2.43	
2020-05-12	2020		238.28	0.00	2.58	110.39	7.58	36.69	8.20	30.91	3.41	2.55	
2020-05-13	2020		308.19	0.00	2.56	112.95	7.56	50.00	4.56	30.77	3.34	2.67	
2020-05-14	2020		272.52	0.00	1.33	114.27	6.33	51.25	10.90	30.60	3.24	2.78	
2020-05-15	2020		255.57	0.00	5.17	119.44	10.17	46.20	7.40	30.48	3.59	2.90	
2020-05-16	2020		304.19	0.00	9.34	128.78	14.34	53.38	5.53	30.34	4.18	3.01	
2020-05-17	2020		258.05	0.00	10.92	139.70	15.92	51.97	8.14	30.18	4.28	3.13	
2020-05-18	2020		190.18	2.20	6.69	146.39	11.69	74.14	8.70	30.01	2.65	3.25	
2020-05-19	2020		198.56	0.00	6.76	153.15	11.76	69.58	6.10	29.85	2.77	3.36	

2020-05-20	2020		213.86	0.00	7.04	160.18	12.04	68.21	5.74	29.83	2.94	3.48	
2020-05-21	2020		42.70	33.90	1.71	161.89	6.71	97.04	10.74	30.24	0.65	3.53	
2020-05-22	2020		117.06	9.70	0.00	161.89	3.94	97.05	13.82	31.07	0.91	3.59	
2020-05-23	2020		232.98	0.00	3.11	165.00	8.11	77.79	10.08	31.12	2.51	3.64	
2020-05-24	2020		283.77	0.00	9.69	174.69	14.69	60.05	5.98	31.02	4.02	3.70	
2020-05-25	2020		208.12	0.00	10.68	185.38	15.68	61.65	4.63	30.84	3.32	3.75	
2020-05-26	2020		204.33	2.30	7.22	192.60	12.22	61.58	10.84	30.68	3.32	3.81	
2020-05-27	2020	0.28	201.67	1.10	5.00	197.60	10.00	67.45	14.25	30.55	2.93	3.86	1.10
2020-05-28	2020	0.35	304.57	0.00	7.27	204.86	12.27	60.02	4.55	30.48	3.85	3.92	1.38
2020-05-29	2020	0.31	216.85	0.80	9.29	214.15	14.29	60.18	6.05	30.36	3.42	3.97	1.25
2020-05-30	2020	0.43	257.87	0.00	12.20	226.35	17.20	54.85	6.83	30.16	4.31	4.03	1.74
2020-05-31	2020	0.36	161.40	34.60	13.37	239.72	18.37	68.57	13.97	30.23	3.58	4.08	1.46
2020-06-01	2020	0.46	270.38	0.10	9.56	249.28	14.56	47.63	13.72	31.73	4.87	4.14	1.89
2020-06-02	2020	0.47	317.25	0.90	10.20	259.48	15.20	53.34	7.70	31.47	4.68	4.19	1.95
2020-06-03	2020	0.34	241.74	0.60	6.40	265.87	11.40	73.16	14.29	31.35	3.13	4.25	1.45
2020-06-04	2020	0.32	214.17	4.10	4.75	270.63	9.75	80.47	7.04	31.23	2.53	4.30	1.39
2020-06-05	2020	0.41	308.73	0.00	7.07	277.70	12.07	70.13	5.50	31.11	3.76	4.36	1.78
2020-06-06	2020	0.04	25.31	13.00	6.25	283.95	11.25	92.02	6.12	31.27	0.81	4.41	0.17
2020-06-07	2020	0.01	80.53	27.50	3.15	287.10	8.15	97.83	10.05	32.25	0.94	4.47	0.04
2020-06-08	2020	0.30	234.93	0.40	5.14	292.24	10.14	78.75	9.88	32.43	2.74	4.52	1.36
2020-06-09	2020	0.40	290.08	0.00	8.53	300.76	13.53	60.35	5.69	32.16	3.97	4.58	1.82
2020-06-10	2020	0.43	313.93	0.00	10.32	311.08	15.32	61.60	7.21	31.90	4.46	4.63	2.01
2020-06-11	2020	0.38	255.08	1.10	11.18	322.26	16.18	73.03	6.09	31.67	3.71	4.69	1.80
2020-06-12	2020	0.48	272.08	2.20	14.37	336.63	19.37	61.17	9.38	31.50	4.79	4.74	2.26
2020-06-13	2020	0.39	191.39	0.30	13.23	349.86	18.23	84.85	5.40	31.43	2.97	4.80	1.89
2020-06-14	2020	0.39	210.69	17.00	10.69	360.55	15.69	83.82	8.21	31.90	2.96	4.85	1.87
2020-06-15	2020	0.32	203.70	8.80	8.15	368.70	13.15	79.30	8.49	32.06	2.80	4.91	1.57
2020-06-16	2020	0.49	325.02	0.00	9.35	378.05	14.35	69.48	7.31	31.91	4.24	4.96	2.42
2020-06-17	2020	0.18	68.37	1.90	7.14	385.18	12.14	88.91	8.67	31.71	1.30	5.02	0.90
2020-06-18	2020	0.42	289.95	0.10	6.83	392.01	11.83	74.55	4.47	31.60	3.52	5.07	2.13

2020-06-19	2020	0.44	349.09	0.00	9.22	401.23	14.22	65.61	3.49	31.36	4.45	5.13	2.24
2020-06-20	2020	0.45	332.89	0.00	11.26	412.49	16.26	64.16	4.30	31.05	4.60	5.18	2.36
2020-06-21	2020	0.32	215.03	0.00	10.25	422.74	15.25	78.35	4.53	30.79	3.10	5.24	1.69
2020-06-22	2020	0.46	247.20	0.00	13.51	436.25	18.51	70.73	3.76	30.59	3.84	5.29	2.43
2020-06-23	2020	0.42	273.11	0.10	14.19	450.43	19.19	73.00	5.83	30.30	4.24	5.35	2.27
2020-06-24	2020	0.34	204.85	3.60	11.85	462.28	16.85	81.35	4.65	30.11	3.07	5.40	1.84
2020-06-25	2020	0.49	300.14	0.00	13.15	475.43	18.15	61.75	6.69	30.01	4.69	5.46	2.69
2020-06-26	2020	0.41	158.45	0.00	12.45	487.88	17.45	61.79	5.60	29.82	3.13	5.51	2.23
2020-06-27	2020	0.29	188.98	3.70	9.63	497.50	14.63	83.71	7.87	29.79	2.66	5.57	1.59
2020-06-28	2020	0.28	191.91	1.40	8.69	506.20	13.69	86.36	8.51	29.82	2.52	5.62	1.55
2020-06-29	2020	0.37	212.30	0.80	10.50	516.70	15.50	83.99	6.75	29.88	2.96	5.68	2.09
2020-06-30	2020	0.07	80.15	17.80	8.77	525.47	13.77	98.45	4.95	30.10	1.24	5.73	0.42
2020-07-01	2020	0.14	107.11	21.70	9.64	535.11	14.64	94.30	6.27	31.28	1.61	5.79	0.83
2020-07-02	2020	0.33	205.91	0.30	8.95	544.05	13.95	78.76	5.93	31.38	2.88	5.84	1.94
2020-07-03	2020	0.47	302.12	0.10	11.99	556.04	16.99	64.48	6.16	31.16	4.45	5.89	2.79
2020-07-04	2020	0.32	212.25	3.90	10.16	566.20	15.16	81.85	6.37	30.93	2.98	5.95	1.89
2020-07-05	2020	0.31	224.14	7.20	10.14	576.35	15.14	84.59	7.97	30.77	2.99	6.00	1.84
2020-07-06	2020	0.40	227.28	0.60	10.90	587.25	15.90	77.27	3.27	30.59	3.26	6.06	2.41
2020-07-07	2020	0.24	129.72	14.90	10.10	597.35	15.10	89.35	4.81	30.52	1.99	6.11	1.44
2020-07-08	2020	0.13	123.80	8.90	9.27	606.62	14.27	93.95	10.01	31.75	1.67	6.17	0.83
2020-07-09	2020	0.41	278.49	10.40	11.73	618.35	16.73	78.57	5.75	31.73	3.85	6.22	2.52
2020-07-10	2020	0.43	331.98	3.30	11.73	630.08	16.73	72.43	6.64	31.90	4.51	6.28	2.72
2020-07-11	2020	0.46	278.80	0.00	14.21	644.29	19.21	64.56	5.09	31.52	4.39	6.33	2.94
2020-07-12	2020	0.40	253.80	2.10	11.10	655.39	16.10	73.47	9.90	31.24	3.72	6.39	2.58
2020-07-13	2020	0.37	219.84	0.70	9.15	664.54	14.15	71.19	13.48	30.96	3.37	6.44	2.38
2020-07-14	2020	0.49	310.18	0.20	12.34	676.87	17.34	57.28	16.84	30.60	5.34	6.50	3.16
2020-07-15	2020	0.36	248.05	0.30	11.85	688.72	16.85	69.33	11.43	30.20	3.95	6.55	2.37
2020-07-16	2020	0.28	165.65	17.30	12.24	700.96	17.24	81.20	4.82	30.29	2.65	6.61	1.87
2020-07-17	2020	0.39	304.01	0.60	12.01	712.97	17.01	72.41	10.62	31.20	4.30	6.66	2.62
2020-07-18	2020	0.39	256.30	0.00	11.73	724.70	16.73	71.35	11.75	30.88	3.92	6.72	2.62

2020-07-19	2020	0.35	200.58	1.80	12.22	736.92	17.22	79.88	8.12	30.68	3.08	6.77	2.37
2020-07-20	2020	0.41	281.78	0.00	13.18	750.09	18.18	77.43	6.39	30.40	4.02	6.83	2.79
2020-07-21	2020	0.40	182.25	0.10	14.00	764.09	19.00	77.88	6.05	30.08	3.05	6.88	2.73
2020-07-22	2020	0.36	269.84	8.60	13.62	777.70	18.62	80.46	4.49	30.25	3.87	6.94	2.50
2020-07-23	2020	0.15	125.10	10.40	12.54	790.24	17.54	93.89	4.60	30.66	1.94	6.99	1.04
2020-07-24	2020	0.28	214.83	0.00	9.95	800.19	14.95	83.08	5.55	31.03	2.88	7.05	1.95
2020-07-25	2020	0.38	244.32	0.40	10.09	810.28	15.09	75.14	9.29	30.74	3.38	7.10	2.72
2020-07-26	2020	0.47	305.78	0.00	13.15	823.43	18.15	64.56	8.06	30.41	4.59	7.16	3.35
2020-07-27	2020	0.48	303.98	0.00	16.57	840.00	21.57	65.97	5.70	29.91	4.85	7.21	3.48
2020-07-28	2020	0.48	288.47	0.00	17.18	857.17	22.18	76.83	5.36	29.45	4.52	7.21	3.43
2020-07-29	2020	0.45	280.50	0.00	17.02	874.19	22.02	77.43	6.76	29.14	4.42	7.21	3.23
2020-07-30	2020	0.42	247.51	0.40	16.07	890.26	21.07	81.37	5.25	28.89	3.81	7.21	3.00
2020-07-31	2020	0.46	272.90	0.20	15.67	905.93	20.67	76.33	4.17	28.61	4.11	7.22	3.35
2020-08-01	2020	0.47	263.33	0.00	17.00	922.93	22.00	64.78	8.10	28.30	4.65	7.22	3.40
2020-08-02	2020	0.47	263.56	0.00	18.29	941.22	23.29	62.71	9.15	28.00	4.98	7.22	3.41
2020-08-03	2020	0.34	186.33	12.60	13.77	954.99	18.77	79.94	8.73	27.82	3.02	7.22	2.43
2020-08-04	2020	0.47	290.86	0.00	13.17	968.15	18.17	69.98	6.79	27.75	4.17	7.22	3.38
2020-08-05	2020	0.49	285.86	0.00	14.91	983.07	19.91	75.36	5.06	27.53	4.15	7.22	3.50
2020-08-06	2020	0.50	251.95	0.00	16.45	999.52	21.45	69.32	5.96	27.22	4.13	7.22	3.60
2020-08-07	2020	0.15	58.90	12.40	9.25	1008.77	14.25	77.68	12.19	27.40	1.81	7.22	1.07
2020-08-08	2020	0.36	189.20	0.20	8.67	1017.44	13.67	67.74	8.53	27.93	2.92	7.22	2.61
2020-08-09	2020	0.50	281.25	0.00	10.14	1027.58	15.14	55.85	14.41	27.87	4.49	7.22	3.64
2020-08-10	2020	0.49	274.30	0.00	11.42	1039.00	16.42	54.48	10.54	27.44	4.43	7.22	3.55
2020-08-11	2020	0.38	213.99	7.80	8.25	1047.25	13.25	70.30	6.70	27.04	2.89	7.22	2.71
2020-08-12	2020	0.35	224.98	5.60	7.73	1054.98	12.73	78.08	8.43	27.42	2.75	7.22	2.55
2020-08-13	2020	0.43	219.43	0.10	9.58	1064.56	14.58	65.51	6.74	27.46	3.16	7.22	3.13
2020-08-14	2020	0.48	229.57	0.00	10.15	1074.71	15.15	64.68	7.69	27.18	3.36	7.22	3.50
2020-08-15	2020	0.42	212.33	0.00	11.71	1086.42	16.71	77.30	5.90	26.85	2.97	7.22	3.02
2020-08-16	2020	0.49	267.39	0.00	14.02	1100.44	19.02	75.39	5.45	26.55	3.73	7.22	3.57
2020-08-17	2020	0.41	218.57	0.00	14.26	1114.70	19.26	77.43	4.23	26.20	3.19	7.23	2.96

2020-08-18	2020	0.46	249.93	0.00	15.77	1130.47	20.77	74.33	4.23	25.93	3.69	7.23	3.31
2020-08-19	2020	0.43	239.77	0.00	13.17	1143.64	18.17	72.83	4.55	25.67	3.34	7.23	3.14
2020-08-20	2020	0.36	149.05	6.80	12.09	1155.73	17.09	81.77	4.59	25.47	2.25	7.23	2.63
2020-08-21	2020	0.41	229.19	1.00	12.56	1168.29	17.56	82.56	5.03	25.78	3.01	7.23	2.98
2020-08-22	2020	0.22	141.94	3.20	11.09	1179.38	16.09	83.97	6.30	24.46	2.10	7.23	1.58
2020-08-23	2020	0.45	242.55	0.00	10.41	1189.79	15.41	67.78	4.46	24.67	3.10	7.23	3.23
2020-08-24	2020	0.42	168.15	6.20	10.02	1199.81	15.02	82.67	6.20	24.71	2.25	7.23	3.02
2020-08-25	2020	0.39	219.94	0.10	8.65	1208.47	13.65	80.71	5.06	24.89	2.56	7.23	2.83
2020-08-26	2020	0.40	209.10	8.50	8.95	1217.41	13.95	83.65	4.35	25.00	2.43	7.23	2.86
2020-08-27	2020	0.38	210.67	0.60	8.42	1225.83	13.42	80.27	6.66	24.99	2.46	7.23	2.71
2020-08-28	2020	0.44	201.55	0.00	8.51	1234.35	13.51	79.62	4.52	24.77	2.37	7.23	3.21
2020-08-29	2020	0.50	156.61	0.00	7.85	1242.19	12.85	67.32	10.02	24.41	2.53	7.23	3.65
2020-08-30	2020	0.50	222.95	0.10	4.81	1247.00	9.81	62.16	15.88	23.95	2.95	7.23	3.64
2020-08-31	2020	0.43	160.50	0.00	5.31	1252.31	10.31	71.94	6.82	23.65	2.04	7.23	3.10
2020-09-01	2020	0.53	184.02	0.00	10.68	1263.00	15.68	56.44	12.35	23.28	3.53	7.23	3.86
2020-09-02	2020	0.40	173.63	3.30	7.70	1270.70	12.70	78.83	11.51	22.96	2.21	7.23	2.86
2020-09-03	2020	0.42	136.08	0.00	8.37	1279.07	13.37	70.33	6.69	22.81	2.11	7.24	3.05
2020-09-04	2020	0.32	124.60	0.00	9.51	1288.58	14.51	78.54	4.06	22.65	1.78	7.24	2.35
2020-09-05	2020	0.30	144.56	0.10	8.40	1296.98	13.40	85.32	6.88	22.57	1.78	7.24	2.16
2020-09-06	2020	0.32	112.33	0.30	5.78	1302.75	10.78	85.60	5.81	22.47	1.40	7.24	2.31
2020-09-07	2020	0.23	153.38	1.50	1.50	1304.25	6.50	88.14	7.39	22.42	1.33	7.24	1.63
2020-09-08	2020	0.38	149.28	0.00	6.02	1310.26	11.02	74.53	7.91	22.39	1.91	7.24	2.77
2020-09-09	2020	0.34	151.45	0.00	7.35	1317.62	12.35	84.28	4.65	22.28	1.70	7.24	2.47
2020-09-10	2020	0.36	194.58	0.00	11.55	1329.16	16.55	75.51	4.26	22.16	2.38	7.24	2.59
2020-09-11	2020	0.35	185.97	0.00	9.15	1338.32	14.15	75.60	7.49	22.04	2.26	7.24	2.50
2020-09-12	2020	0.26	72.92	0.00	3.93	1342.25	8.93	81.70	2.92	21.97	1.05	7.24	1.89
2020-09-13	2020		66.81	0.10	3.65	1345.90	8.65	95.92	4.06	21.99	0.82	7.24	
2020-09-14	2020		55.29	0.00	3.06	1348.97	8.06	94.00	6.12		0.76	6.90	
2020-09-15	2020		82.36	0.10	2.18	1351.14	7.18	90.44	6.60		0.92	6.55	
2020-09-16	2020		168.90	0.00	2.93	1354.07	7.93	82.89	4.82		1.45	6.21	

2020-09-17	2020		177.04	0.00	5.33	1359.40	10.33	75.08	3.71		1.67	5.86	
2020-09-18	2020		144.98	0.00	8.36	1367.76	13.36	73.50	4.05		1.71	5.52	
2020-09-19	2020		80.15	0.00	6.28	1374.03	11.28	92.55	3.76		0.98	5.17	
2020-09-20	2020		145.02	0.00	9.15	1383.18	14.15	77.10	10.01		1.94	4.83	
2020-09-21	2020		137.53	0.00	5.03	1388.21	10.03	80.35	5.62		1.40	4.48	
2020-09-22	2020		156.98	0.00	6.62	1394.83	11.62	77.63	4.19		1.54	4.14	
2020-09-23	2020		132.67	0.00	8.43	1403.26	13.43	71.94	6.93		1.78	3.79	
2020-09-24	2020		124.44	1.00	9.55	1412.81	14.55	56.34	8.87		2.42	3.45	
2020-09-25	2020		141.62	0.10	8.00	1420.82	13.00	51.15	5.14		1.97	3.10	
2020-09-26	2020		162.65	0.00	6.26	1427.08	11.26	61.60	11.73		2.27	2.76	
2020-09-27	2020		125.53	0.00	4.48	1431.55	9.48	60.03	10.25		1.97	2.41	
2020-09-28	2020		116.65	0.00	9.45	1441.00	14.45	56.65	7.57		2.15	2.07	
2020-09-29	2020		150.13	0.50	6.79	1447.79	11.79	51.62	9.38		2.33	1.72	
2020-09-30	2020		155.88	0.00	1.04	1448.83	6.04	67.45	4.28		1.18	1.38	
2020-10-01	2020		101.77	0.00	3.56	1452.39	8.56	75.68	3.59		1.02	1.03	
2020-10-02	2020		149.18	0.00	5.18	1457.57	10.18	74.90	6.90		1.37	0.69	
2020-10-03	2020		140.98	0.00	5.65	1463.23	10.65	66.63	4.65		1.34	0.34	
2020-10-04	2020		47.51	0.00	8.49	1471.72	13.49	74.30	5.31		1.17		
2020-10-05	2020		53.43	0.00	7.99	1479.70	12.99	55.22	7.04		1.81		
2020-10-06	2020		118.37	0.00	6.66	1486.37	11.66	46.14	9.76		2.33		
2020-10-07	2020		112.04	0.00	2.72	1489.09	7.72	52.81	2.68		0.99		
2020-10-08	2020		53.30	0.00	3.07	1492.16	8.07	60.88	8.83		1.50		
2020-10-09	2020		79.19	0.00	0.00	1492.16	3.88	80.07	5.00		0.71		
2020-10-10	2020		81.73	4.50	1.64	1493.80	6.64	83.49	4.42		0.71		
2020-10-11	2020		91.19	4.00	0.00	1493.80	4.65	83.30	14.85	412.40	0.85		
2020-10-12	2020		115.93	0.00	0.00	1493.80	4.28	71.20	11.29		1.09		
2020-10-13	2020		79.71	0.00	0.00	1493.80	2.99	69.81	4.59		0.74		
2020-10-14	2020		87.53	0.00	0.00	1493.80	1.58	78.82	6.98		0.65		
2020-10-15	2020		62.80	0.00	0.00	1493.80	1.34	76.32	10.99		0.80		
2020-10-16	2020		42.31	0.10	0.00	1493.80	-2.45	74.69	5.48		0.55		

2020-10-17	2020		55.52	0.00	0.00	1493.80	-7.85	75.71	9.43		0.46		
2020-10-18	2020		38.34	0.00	0.00	1493.80	-6.29	71.05	3.72		0.42		
2020-10-19	2020		49.42	1.20	0.00	1493.80	-4.64	80.18	7.50		0.45		
2020-10-20	2020		72.65	0.00	0.00	1493.80	-4.23	83.07	4.79		0.34		
2020-10-21	2020		62.43	0.20	0.00	1493.80	-4.91	80.36	8.27		0.42		
2020-10-22	2020		43.40	0.10	0.00	1493.80	-8.32	81.00	5.21		0.31		
2020-10-23	2020		48.45	0.00	0.00	1493.80	-8.10	78.55	3.11		0.28		
2020-10-24	2020		54.81	0.10	0.00	1493.80	-8.08	79.68	5.91		0.31		
2020-10-25	2020		92.98	0.00	0.00	1493.80	-7.04	60.09	4.89		0.39		
2020-10-26	2020		71.63	0.80	0.00	1493.80	0.97	63.43	6.88		0.71		
2020-10-27	2020		26.20	0.10	0.90	1494.70	5.90	82.81	10.13		0.73		
2020-10-28	2020		83.13	0.10	0.00	1494.70	0.15	89.30	3.35		0.16		
2020-10-29	2020		76.15	0.00	0.00	1494.70	0.39	90.97	6.06		0.19		
2020-10-30	2020		19.88	2.00	0.00	1494.70	0.65	94.92	9.30		0.31		
2020-10-31	2020		49.95	0.00	0.00	1494.70	1.24	74.53	6.40		0.52		
2020-11-01	2020		76.50	0.00	2.75	1497.45	7.75	54.07	6.09		0.87		
2020-11-02	2020		30.65	0.00	3.76	1501.21	8.76	48.05	3.68		0.98		
2020-11-03	2020		48.25	0.00	0.30	1501.52	5.30	61.73	2.73		0.45		
2020-11-04	2020		60.23	0.30	0.00	1501.52	4.81	73.98	4.95		0.41		
2020-11-05	2020		20.82	3.40	0.00	1501.52	3.15	91.97	6.27		0.35		
2020-11-06	2020		32.04	0.00	0.00	1501.52	-1.71	97.45	3.61		0.15		
2020-11-07	2020		21.82	11.40	0.00	1501.52	-4.18	99.75	10.86		0.12		
2020-11-08	2020		56.03	0.20	0.00	1501.52	-9.98	92.15	10.68		0.09		
2020-11-09	2020		58.42	0.00	0.00	1501.52	-10.35	86.43	3.58		0.04		
2020-11-10	2020		33.69	4.20	0.00	1501.52	-1.94	98.32	10.63		0.10		
2020-11-11	2020		67.66	0.20	0.00	1501.52	-13.34	91.00	5.25		-0.01		
2020-11-12	2020		55.48	0.00	0.00	1501.52	-7.98	78.67	3.67		0.07		
2020-11-13	2020		41.10	0.00	0.00	1501.52	-6.86	77.85	2.24		0.10		
2020-11-14	2020		42.44	0.00	0.00	1501.52	-6.53	96.15	5.41		0.02		
2020-11-15	2020		35.54	0.00	0.00	1501.52	-10.82	99.21	2.66		0.02		

2020-11-16	2020		16.30	0.20	0.00	1501.52	-7.90	100.00	3.24		0.12		
2020-11-17	2020		18.60	0.20	0.00	1501.52	-6.77	100.00	6.70		0.09		
2020-11-18	2020		20.54	4.40	0.00	1501.52	-6.86	98.70	9.20		0.09		
2020-11-19	2020		36.11	0.50	0.00	1501.52	-13.57	95.53	6.74		0.02		
2020-11-20	2020		55.05	0.00	0.00	1501.52	-13.06	92.08	2.80		-0.08		
2020-11-21	2020		40.55	0.00	0.00	1501.52	-8.82	93.43	4.28		-0.02		
2020-11-22	2020		36.57	0.00	0.00	1501.52	-10.72	96.52	3.12		-0.02		
2020-11-23	2020		26.48	0.00	0.00	1501.52	-7.77	99.89	2.51		0.02		
2020-11-24	2020		28.13	0.00	0.00	1501.52	-5.24	94.15	3.42		0.04		
2020-11-25	2020		49.82	0.90	0.00	1501.52	-1.55	92.11	8.55		-0.07		
2020-11-26	2020		31.07	0.00	0.00	1501.52	-2.59	87.40	7.64		0.15		
2020-11-27	2020		46.69	0.10	0.00	1501.52	0.29	81.80	5.18		-0.02		
2020-11-28	2020		41.75	0.10	0.00	1501.52	-5.02	90.73	6.65		-0.04		
2020-11-29	2020		27.75	0.00	0.00	1501.52	-7.45	84.41	3.13		0.06		
2020-11-30	2020		34.33	0.00	0.00	1501.52	-1.37	73.44	6.36		0.25		
2020-12-01	2020		46.85	0.00	0.00	1501.52	-0.59	57.42	11.19		0.65		
2020-12-02	2020		44.02	0.00	0.00	1501.52	1.00	63.56	3.98		0.05		
2020-12-03	2020		44.49	0.00	0.00	1501.52	0.52	68.31	3.29		-0.08		
2020-12-04	2020		41.35	0.00	0.00	1501.52	-0.74	81.02	3.22		-0.13		
2020-12-05	2020		29.29	0.00	0.00	1501.52	-1.78	71.06	2.75		0.08		
2020-12-06	2020		42.81	0.00	0.00	1501.52	-0.96	62.06	3.53		-0.02		
2020-12-07	2020		31.10	0.00	0.00	1501.52	4.75	58.41	4.98		0.43		
2020-12-08	2020		38.34	0.30	0.00	1501.52	2.63	94.43	4.23		-0.22		
2020-12-09	2020		42.91	0.00	0.00	1501.52	-0.10	78.86	6.00		-0.03		
2020-12-10	2020		40.68	0.10	0.00	1501.52	-5.97	90.21	4.48		-0.15		
2020-12-11	2020		20.50	0.10	0.00	1501.52	-12.01	99.97	3.95		0.00		
2020-12-12	2020		28.84	0.00	0.00	1501.52	-10.70	85.22	13.13		0.14		
2020-12-13	2020		28.74	0.10	0.00	1501.52	-18.97	86.40	4.36		0.01		
2020-12-14	2020		18.94	1.60	0.00	1501.52	-13.88	92.06	4.03		0.04		
2020-12-15	2020		25.46	0.10	0.00	1501.52	-10.84	96.75	2.54		-0.05		

2020-12-16	2020		25.34	0.10	0.00	1501.52	-7.58	99.31	2.61		-0.07		
2020-12-17	2020		18.38	2.00	0.00	1501.52	-13.54	92.36	11.64		0.08		
2020-12-18	2020		29.70	0.00	0.00	1501.52	-15.76	86.49	3.30		-0.02		
2020-12-19	2020		33.89	0.00	0.00	1501.52	-0.51	74.25	9.28		0.29		
2020-12-20	2020		29.60	0.00	0.00	1501.52	0.58	59.86	8.27		0.58		
2020-12-21	2020		20.99	0.00	0.00	1501.52	-1.99	69.92	4.77		0.30		
2020-12-22	2020		30.28	0.10	0.00	1501.52	-7.22	95.19	5.70		-0.07		
2020-12-23	2020		30.09	0.00	0.00	1501.52	-5.77	76.42	4.76		0.08		
2020-12-24	2020		31.22	0.00	0.00	1501.52	2.53	55.31	5.63		0.45		
2020-12-25	2020		33.50	0.00	0.00	1501.52	-5.82	96.79	1.96		-0.18		
2020-12-26	2020		15.53	0.00	0.00	1501.52	-7.34	100.00	2.05		0.05		
2020-12-27	2020		30.12	0.10	0.00	1501.52	-10.48	99.98	2.60		-0.10		
2020-12-28	2020		36.70	0.00	0.00	1501.52	-5.73	86.68	5.48		-0.06		
2020-12-29	2020		40.34	0.00	0.00	1501.52	-7.91	79.61	5.09		-0.04		
2020-12-30	2020		38.84	0.00	0.00	1501.52	-8.63	86.40	1.95		-0.16		
2020-12-31	2020		30.51	0.00	0.00	1501.52	-7.57	95.24	1.89		-0.10		

year	month	day	hour	new date	row	volumetric moisture content (cm3 cm-3)												storage (cm) S_x	S_y	average S
						5 cm x daily	20 cm x daily	40 cm x daily	60 cm x daily	100 cm x daily	150 cm x daily	5 cm y daily	20 cm y daily	40 cm y daily	60 cm y daily	100 cm y daily	150 cm y daily			
2019	6	18	23	43634	0	0.09	0.24	0.23	0.23	0.17	0.16	0.11	0.15	0.23	0.19	0.21	0.17	28.86	27.87	28.37
2019	6	19	23	43635	1	0.12	0.24	0.23	0.23	0.14	0.13	0.14	0.14	0.23	0.18	0.21	0.17	27.25	27.96	27.60
2019	6	20	23	43636	2	0.19	0.25	0.23	0.23	0.14	0.13	0.20	0.19	0.23	0.18	0.21	0.17	28.00	29.34	28.67
2019	6	21	23	43637	3	0.18	0.25	0.23	0.23	0.14	0.13	0.20	0.21	0.23	0.19	0.21	0.17	28.29	29.93	29.11
2019	6	22	23	43638	4	0.17	0.25	0.23	0.23	0.14	0.14	0.18	0.19	0.23	0.19	0.21	0.17	28.27	29.72	29.00
2019	6	23	23	43639	5	0.16	0.25	0.23	0.23	0.14	0.14	0.17	0.19	0.23	0.19	0.21	0.17	28.17	29.51	28.84
2019	6	24	23	43640	6	0.16	0.25	0.23	0.23	0.14	0.14	0.18	0.18	0.23	0.19	0.21	0.17	28.15	29.47	28.81
2019	6	25	23	43641	7	0.17	0.25	0.23	0.23	0.14	0.14	0.18	0.19	0.23	0.19	0.21	0.17	28.20	29.58	28.89
2019	6	26	23	43642	8	0.16	0.25	0.23	0.23	0.14	0.14	0.18	0.18	0.23	0.19	0.21	0.17	28.14	29.49	28.82
2019	6	27	23	43643	9	0.16	0.25	0.23	0.23	0.14	0.14	0.17	0.18	0.23	0.19	0.21	0.17	28.05	29.38	28.72
2019	6	28	23	43644	10	0.19	0.25	0.23	0.23	0.14	0.14	0.20	0.20	0.23	0.19	0.21	0.17	28.42	29.89	29.16
2019	6	29	23	43645	11	0.18	0.25	0.23	0.23	0.14	0.14	0.20	0.21	0.23	0.19	0.21	0.17	28.58	30.28	29.43
2019	6	30	23	43646	12	0.18	0.25	0.23	0.23	0.15	0.14	0.19	0.20	0.23	0.19	0.21	0.17	28.57	30.30	29.43
2019	7	1	23	43647	13	0.17	0.25	0.23	0.23	0.15	0.14	0.19	0.20	0.23	0.20	0.21	0.17	28.55	30.17	29.36
2019	7	2	23	43648	14	0.17	0.25	0.23	0.24	0.15	0.14	0.19	0.20	0.23	0.20	0.21	0.17	28.56	30.19	29.37
2019	7	3	23	43649	15	0.16	0.25	0.23	0.23	0.15	0.14	0.18	0.19	0.23	0.20	0.21	0.17	28.43	30.01	29.22
2019	7	4	23	43650	16	0.15	0.25	0.23	0.23	0.15	0.14	0.17	0.19	0.23	0.19	0.21	0.17	28.26	29.83	29.05
2019	7	5	23	43651	17	0.15	0.25	0.23	0.23	0.14	0.14	0.16	0.18	0.23	0.19	0.21	0.17	28.08	29.67	28.88
2019	7	6	23	43652	18	0.14	0.25	0.23	0.23	0.14	0.14	0.16	0.18	0.23	0.19	0.21	0.18	27.96	29.52	28.74
2019	7	7	23	43653	19	0.14	0.25	0.23	0.23	0.14	0.14	0.16	0.18	0.23	0.19	0.21	0.18	27.86	29.43	28.64
2019	7	8	23	43654	20	0.14	0.25	0.23	0.23	0.14	0.14	0.16	0.18	0.23	0.19	0.21	0.18	27.84	29.44	28.64
2019	7	9	23	43655	21	0.14	0.25	0.23	0.23	0.14	0.14	0.16	0.17	0.23	0.19	0.21	0.18	27.73	29.29	28.51
2019	7	10	23	43656	22	0.13	0.25	0.23	0.23	0.14	0.14	0.15	0.17	0.23	0.19	0.21	0.18	27.64	29.15	28.39
2019	7	11	23	43657	23	0.13	0.24	0.23	0.23	0.14	0.14	0.15	0.17	0.23	0.19	0.21	0.18	27.51	29.06	28.29
2019	7	12	23	43658	24	0.12	0.24	0.23	0.23	0.14	0.14	0.15	0.17	0.23	0.19	0.21	0.18	27.33	28.88	28.11
2019	7	13	23	43659	25	0.11	0.24	0.22	0.23	0.14	0.14	0.14	0.16	0.23	0.19	0.21	0.18	27.13	28.63	27.88
2019	7	14	23	43660	26	0.11	0.24	0.22	0.23	0.14	0.14	0.13	0.16	0.23	0.18	0.21	0.18	26.97	28.43	27.70
2019	7	15	23	43661	27	0.10	0.24	0.22	0.23	0.14	0.14	0.13	0.16	0.23	0.18	0.21	0.18	26.84	28.25	27.54

2019	7	16	23	43662	28	0.10	0.24	0.22	0.23	0.14	0.13	0.12	0.16	0.23	0.18	0.21	0.18	26.70	28.12	27.41
2019	7	17	23	43663	29	0.10	0.24	0.22	0.23	0.14	0.13	0.13	0.16	0.23	0.18	0.21	0.18	26.59	28.04	27.31
2019	7	18	23	43664	30	0.17	0.24	0.22	0.23	0.14	0.13	0.19	0.15	0.23	0.18	0.21	0.18	27.18	28.55	27.86
2019	7	19	23	43665	31	0.20	0.24	0.22	0.23	0.14	0.13	0.22	0.20	0.22	0.18	0.21	0.18	27.52	29.71	28.61
2019	7	20	23	43666	32	0.19	0.25	0.23	0.23	0.14	0.13	0.21	0.21	0.23	0.19	0.21	0.18	27.98	30.31	29.14
2019	7	21	23	43667	33	0.17	0.25	0.23	0.23	0.14	0.13	0.19	0.19	0.23	0.19	0.21	0.18	27.87	29.91	28.89
2019	7	22	23	43668	34	0.15	0.25	0.23	0.23	0.14	0.14	0.17	0.19	0.23	0.19	0.21	0.18	27.72	29.59	28.66
2019	7	23	23	43669	35	0.14	0.25	0.22	0.23	0.14	0.14	0.16	0.18	0.23	0.19	0.21	0.18	27.49	29.29	28.39
2019	7	24	23	43670	36	0.13	0.24	0.22	0.23	0.14	0.14	0.15	0.17	0.23	0.19	0.21	0.18	27.40	29.05	28.23
2019	7	25	23	43671	37	0.14	0.24	0.22	0.23	0.14	0.14	0.16	0.17	0.23	0.19	0.21	0.18	27.37	29.02	28.19
2019	7	26	23	43672	38	0.13	0.24	0.22	0.23	0.14	0.14	0.16	0.17	0.23	0.19	0.21	0.18	27.20	28.89	28.04
2019	7	27	23	43673	39	0.14	0.24	0.22	0.23	0.14	0.13	0.17	0.17	0.23	0.19	0.21	0.18	27.18	28.88	28.03
2019	7	28	23	43674	40	0.19	0.24	0.22	0.23	0.14	0.13	0.21	0.21	0.23	0.19	0.21	0.18	27.80	30.09	28.94
2019	7	29	23	43675	41	0.19	0.26	0.23	0.23	0.14	0.13	0.22	0.21	0.23	0.19	0.21	0.18	28.25	30.59	29.42
2019	7	30	23	43676	42	0.17	0.26	0.23	0.23	0.14	0.14	0.19	0.20	0.24	0.20	0.21	0.18	28.36	30.58	29.47
2019	7	31	23	43677	43	0.16	0.25	0.23	0.23	0.14	0.14	0.18	0.19	0.24	0.20	0.21	0.18	28.29	30.40	29.35
2019	8	1	23	43678	44	0.18	0.25	0.23	0.23	0.14	0.14	0.19	0.20	0.24	0.20	0.21	0.18	28.43	30.56	29.49
2019	8	2	23	43679	45	0.17	0.25	0.23	0.23	0.14	0.14	0.18	0.19	0.24	0.20	0.21	0.18	28.32	30.37	29.35
2019	8	3	23	43680	46	0.16	0.25	0.23	0.23	0.14	0.14	0.18	0.19	0.24	0.20	0.21	0.18	28.24	30.21	29.22
2019	8	4	23	43681	47	0.15	0.25	0.23	0.23	0.14	0.14	0.17	0.18	0.24	0.19	0.21	0.18	28.08	29.97	29.03
2019	8	5	23	43682	48	0.14	0.25	0.23	0.23	0.14	0.14	0.17	0.18	0.23	0.19	0.21	0.18	27.86	29.74	28.80
2019	8	6	23	43683	49	0.14	0.25	0.23	0.23	0.14	0.14	0.18	0.17	0.23	0.19	0.21	0.18	27.84	29.70	28.77
2019	8	7	23	43684	50	0.14	0.24	0.23	0.23	0.14	0.14	0.16	0.17	0.23	0.19	0.21	0.18	27.71	29.48	28.60
2019	8	8	23	43685	51	0.13	0.24	0.22	0.23	0.14	0.14	0.16	0.17	0.23	0.19	0.21	0.18	27.52	29.28	28.40
2019	8	9	23	43686	52	0.12	0.24	0.22	0.23	0.14	0.14	0.15	0.16	0.23	0.19	0.21	0.18	27.37	29.12	28.25
2019	8	10	23	43687	53	0.12	0.24	0.22	0.23	0.14	0.14	0.15	0.16	0.23	0.19	0.21	0.18	27.27	29.00	28.14
2019	8	11	23	43688	54	0.12	0.24	0.22	0.23	0.14	0.14	0.14	0.16	0.23	0.19	0.21	0.18	27.16	28.85	28.00
2019	8	12	23	43689	55	0.11	0.24	0.22	0.23	0.14	0.14	0.14	0.16	0.23	0.18	0.21	0.18	27.07	28.72	27.90
2019	8	13	23	43690	56	0.11	0.24	0.22	0.23	0.14	0.14	0.14	0.16	0.23	0.18	0.21	0.18	26.98	28.62	27.80
2019	8	14	23	43691	57	0.11	0.24	0.22	0.23	0.14	0.14	0.14	0.15	0.23	0.18	0.21	0.18	26.84	28.44	27.64

2019	8	15	23	43692	58	0.11	0.23	0.22	0.23	0.14	0.14	0.13	0.15	0.23	0.18	0.21	0.18	26.67	28.23	27.45
2019	8	16	23	43693	59	0.10	0.23	0.22	0.23	0.14	0.13	0.13	0.15	0.23	0.18	0.21	0.18	26.53	28.08	27.30
2019	8	17	23	43694	60	0.10	0.23	0.22	0.23	0.14	0.13	0.12	0.15	0.23	0.18	0.21	0.18	26.42	27.96	27.19
2019	8	18	23	43695	61	0.10	0.23	0.21	0.23	0.14	0.13	0.12	0.15	0.23	0.18	0.21	0.18	26.32	27.88	27.10
2019	8	19	23	43696	62	0.10	0.23	0.21	0.23	0.14	0.13	0.12	0.15	0.22	0.18	0.21	0.18	26.24	27.83	27.03
2019	8	20	23	43697	63	0.10	0.23	0.21	0.23	0.14	0.13	0.12	0.15	0.22	0.18	0.21	0.18	26.15	27.75	26.95
2019	8	21	23	43698	64	0.10	0.23	0.21	0.23	0.14	0.13	0.12	0.14	0.22	0.18	0.21	0.18	25.98	27.60	26.79
2019	8	22	23	43699	65	0.10	0.22	0.21	0.23	0.14	0.13	0.12	0.14	0.22	0.18	0.20	0.18	25.79	27.48	26.63
2019	8	23	23	43700	66	0.10	0.22	0.21	0.23	0.14	0.13	0.12	0.14	0.22	0.18	0.20	0.18	25.61	27.34	26.48
2019	8	24	23	43701	67	0.10	0.22	0.21	0.22	0.13	0.13	0.12	0.14	0.22	0.18	0.20	0.18	25.52	27.29	26.41
2019	8	25	23	43702	68	0.10	0.22	0.21	0.22	0.13	0.13	0.12	0.14	0.22	0.17	0.20	0.18	25.40	27.21	26.30
2019	8	26	23	43703	69	0.10	0.21	0.20	0.22	0.13	0.13	0.12	0.14	0.22	0.17	0.20	0.18	25.21	27.09	26.15
2019	8	27	23	43704	70	0.10	0.21	0.20	0.22	0.13	0.13	0.12	0.14	0.22	0.17	0.20	0.18	25.01	27.00	26.00
2019	8	28	23	43705	71	0.10	0.20	0.20	0.22	0.13	0.13	0.12	0.14	0.22	0.17	0.20	0.18	24.77	26.93	25.85
2019	8	29	23	43706	72	0.09	0.19	0.20	0.22	0.13	0.13	0.12	0.13	0.22	0.17	0.20	0.18	24.49	26.89	25.69
2019	8	30	23	43707	73	0.09	0.19	0.20	0.22	0.13	0.13	0.12	0.13	0.22	0.18	0.20	0.18	24.36	26.88	25.62
2019	8	31	23	43708	74	0.09	0.19	0.20	0.22	0.13	0.13	0.12	0.13	0.22	0.18	0.20	0.18	24.40	26.89	25.64
2019	9	1	23	43709	75	0.09	0.19	0.20	0.22	0.13	0.13	0.12	0.13	0.22	0.18	0.20	0.18	24.37	26.88	25.63
2019	9	2	23	43710	76	0.10	0.19	0.20	0.22	0.13	0.12	0.12	0.13	0.22	0.18	0.20	0.18	24.31	26.85	25.58
2019	9	3	23	43711	77	0.10	0.19	0.19	0.22	0.13	0.12	0.12	0.13	0.21	0.18	0.20	0.18	24.18	26.79	25.48
2019	9	4	23	43712	78	0.10	0.18	0.19	0.22	0.13	0.12	0.12	0.13	0.21	0.17	0.20	0.18	23.92	26.72	25.32
2019	9	5	23	43713	79	0.10	0.18	0.19	0.22	0.13	0.12	0.15	0.13	0.21	0.17	0.20	0.18	23.80	26.92	25.36
2019	9	6	23	43714	80	0.10	0.18	0.19	0.22	0.13	0.12	0.14	0.13	0.21	0.17	0.20	0.18	23.80	26.87	25.34
2019	9	7	23	43715	81	0.10	0.18	0.19	0.22	0.13	0.12	0.14	0.13	0.21	0.17	0.20	0.18	23.73	26.79	25.26
2019	9	8	23	43716	82	0.10	0.18	0.19	0.22	0.13	0.12	0.13	0.13	0.21	0.17	0.20	0.18	23.65	26.73	25.19
2019	9	9	23	43717	83	0.10	0.18	0.19	0.22	0.13	0.12	0.14	0.13	0.21	0.18	0.20	0.18	23.71	26.86	25.28
2019	9	10	23	43718	84	0.10	0.18	0.19	0.22	0.13	0.12	0.16	0.13	0.21	0.17	0.20	0.18	23.75	26.86	25.31
2019	9	11	23	43719	85	0.10	0.18	0.19	0.22	0.13	0.12	0.16	0.13	0.21	0.17	0.20	0.18	23.79	26.88	25.34
2019	9	12	23	43720	86	0.10	0.18	0.19	0.22	0.13	0.12	0.15	0.13	0.21	0.17	0.20	0.18	23.77	26.80	25.29
2019	9	13	23	43721	87	0.10	0.18	0.19	0.22	0.13	0.12	0.15	0.13	0.21	0.17	0.20	0.18	23.64	26.69	25.16

2019	9	14	23	43722	88	0.1	0.17	0.19	0.21	0.13	0.12	0.14	0.13	0.21	0.17	0.2	0.18	23.5	26.59	25.04
2019	9	15	23	43723	89	0.09	0.17	0.19	0.21	0.13	0.12	0.14	0.13	0.21	0.17	0.2	0.18	23.31	26.47	24.89
2019	9	16	23	43724	90	0.09	0.16	0.18	0.21	0.13	0.12	0.13	0.13	0.21	0.17	0.19	0.18	23.09	26.36	24.72
2019	9	17	23	43725	91	0.09	0.16	0.18	0.21	0.13	0.12	0.13	0.13	0.21	0.17	0.19	0.17	22.96	26.3	24.63
2019	9	18	23	43726	92	0.09	0.16	0.18	0.21	0.13	0.12	0.13	0.13	0.21	0.17	0.19	0.17	22.85	26.24	24.55
2019	9	19	23	43727	93	0.09	0.15	0.18	0.21	0.13	0.12	0.13	0.13	0.21	0.17	0.19	0.17	22.7	26.15	24.42
2019	9	20	23	43728	94	0.09	0.15	0.18	0.21	0.13	0.12	0.13	0.13	0.21	0.17	0.19	0.17	22.5	26.04	24.27
2019	9	21	23	43729	95	0.09	0.14	0.18	0.21	0.13	0.12	0.12	0.13	0.21	0.17	0.19	0.17	22.31	25.94	24.13
2019	9	22	23	43730	96	0.09	0.14	0.18	0.21	0.13	0.12	0.12	0.13	0.21	0.16	0.19	0.17	22.15	25.84	23.99
2019	9	23	23	43731	97	0.09	0.13	0.18	0.21	0.13	0.12	0.12	0.13	0.21	0.16	0.19	0.17	21.98	25.76	23.87
2019	9	24	23	43732	98	0.09	0.13	0.17	0.21	0.13	0.12	0.12	0.13	0.21	0.16	0.19	0.17	21.87	25.71	23.79
2019	9	25	23	43733	99	0.09	0.13	0.17	0.21	0.13	0.12	0.12	0.13	0.21	0.16	0.19	0.17	21.8	25.66	23.73
2019	9	26	23	43734	100	0.09	0.13	0.17	0.21	0.13	0.12	0.14	0.13	0.21	0.16	0.19	0.17	21.81	25.87	23.84
2019	9	27	23	43735	101	0.14	0.13	0.18	0.21	0.13	0.12	0.18	0.13	0.21	0.16	0.19	0.17	22.38	26.29	24.33
2019	9	28	23	43736	102	0.14	0.13	0.18	0.21	0.13	0.12	0.17	0.13	0.21	0.16	0.19	0.17	22.4	26.28	24.34
2019	9	29	23	43737	103	0.14	0.13	0.18	0.21	0.13	0.12	0.17	0.14	0.21	0.16	0.19	0.17	22.45	26.41	24.43
2019	9	30	23	43738	104	0.13	0.14	0.18	0.21	0.13	0.12	0.17	0.14	0.21	0.16	0.19	0.17	22.48	26.46	24.47
2019	10	1	23	43739	105	0.13	0.14	0.18	0.21	0.13	0.12	0.17	0.14	0.21	0.16	0.19	0.17	22.52	26.46	24.49
2019	10	2	23	43740	106	0.13	0.14	0.18	0.21	0.13	0.12	0.16	0.14	0.21	0.16	0.19	0.17	22.55	26.46	24.5
2019	10	3	23	43741	107	0.13	0.14	0.18	0.21	0.13	0.12	0.16	0.14	0.21	0.16	0.19	0.17	22.59	26.43	24.51
2019	10	4	23	43742	108	0.13	0.15	0.18	0.21	0.13	0.12	0.16	0.14	0.21	0.16	0.19	0.17	22.63	26.42	24.53
2019	10	5	23	43743	109	0.12	0.15	0.18	0.21	0.13	0.12	0.16	0.14	0.21	0.16	0.19	0.17	22.66	26.43	24.55
2019	10	6	23	43744	110	0.12	0.15	0.18	0.21	0.13	0.12	0.16	0.14	0.21	0.16	0.19	0.17	22.7	26.41	24.56
2019	10	7	23	43745	111	0.12	0.15	0.18	0.21	0.13	0.12	0.16	0.14	0.21	0.16	0.19	0.17	22.72	26.4	24.56
2019	10	8	23	43746	112	0.12	0.15	0.18	0.21	0.13	0.12	0.17	0.14	0.21	0.16	0.19	0.17	22.78	26.51	24.65
2019	10	9	23	43747	113	0.13	0.15	0.18	0.21	0.13	0.12	0.17	0.14	0.21	0.16	0.19	0.17	22.85	26.5	24.67
2019	10	10	23	43748	114	0.13	0.16	0.18	0.21	0.13	0.12	0.16	0.14	0.21	0.16	0.19	0.17	22.89	26.41	24.65
2019	10	11	23	43749	115	0.13	0.16	0.18	0.21	0.13	0.12	0.15	0.14	0.21	0.16	0.19	0.17	22.92	26.32	24.62
2019	10	12	23	43750	116	0.13	0.16	0.18	0.21	0.13	0.12	0.16	0.14	0.21	0.16	0.19	0.17	22.95	26.33	24.64
2019	10	13	23	43751	117	0.13	0.16	0.18	0.21	0.13	0.12	0.17	0.14	0.21	0.16	0.19	0.17	22.99	26.42	24.7

2019	10	14	23	43752	118	0.16	0.16	0.18	0.21	0.13	0.12	0.2	0.16	0.21	0.16	0.19	0.17	23.34	27.09	25.22
2019	10	15	23	43753	119	0.16	0.16	0.18	0.21	0.13	0.12	0.19	0.17	0.21	0.16	0.19	0.17	23.39	27.25	25.32
2019	10	16	23	43754	120	0.16	0.17	0.18	0.21	0.13	0.12	0.19	0.17	0.21	0.16	0.19	0.17	23.4	27.17	25.29
2019	10	17	23	43755	121	0.16	0.17	0.18	0.21	0.13	0.12	0.18	0.17	0.21	0.17	0.19	0.17	23.43	27.11	25.27
2019	10	18	23	43756	122	0.15	0.17	0.18	0.21	0.13	0.12	0.18	0.17	0.21	0.17	0.19	0.17	23.44	27.04	25.24
2019	10	19	23	43757	123	0.15	0.17	0.18	0.21	0.13	0.12	0.18	0.16	0.21	0.17	0.19	0.17	23.46	26.97	25.22
2019	10	20	23	43758	124	0.15	0.17	0.18	0.21	0.13	0.12	0.18	0.16	0.21	0.17	0.19	0.17	23.49	26.93	25.21
2019	10	21	23	43759	125	0.15	0.17	0.18	0.21	0.13	0.12	0.17	0.16	0.21	0.17	0.19	0.17	23.52	26.88	25.2
2019	10	22	23	43760	126	0.15	0.18	0.18	0.21	0.13	0.12	0.17	0.16	0.21	0.17	0.19	0.17	23.56	26.86	25.21
2019	10	23	23	43761	127	0.15	0.18	0.18	0.21	0.13	0.12	0.18	0.16	0.21	0.17	0.19	0.17	23.68	26.95	25.32
2019	10	24	23	43762	128	0.15	0.18	0.18	0.21	0.13	0.12	0.18	0.16	0.21	0.17	0.19	0.17	23.71	26.95	25.33
2019	10	25	23	43763	129	0.15	0.18	0.18	0.21	0.13	0.12	0.18	0.16	0.21	0.17	0.19	0.17	23.76	26.96	25.36
2019	10	26	23	43764	130	0.15	0.18	0.18	0.21	0.13	0.12	0.18	0.16	0.21	0.17	0.19	0.17	23.81	26.95	25.38
2019	10	27	23	43765	131	0.15	0.18	0.19	0.21	0.13	0.12	0.16	0.16	0.21	0.17	0.19	0.17	23.78	26.73	25.25
2019	10	28	23	43766	132	0.14	0.18	0.19	0.21	0.13	0.12	0.14	0.16	0.21	0.17	0.19	0.17	23.75	26.45	25.1
2019	10	29	23	43767	133	0.12	0.18	0.19	0.21	0.13	0.12	0.12	0.16	0.21	0.17	0.19	0.17	23.53	26.2	24.87
2019	10	30	23	43768	134	0.1	0.19	0.19	0.21	0.13	0.12	0.11	0.15	0.21	0.17	0.19	0.17	23.35	26.1	24.73
2019	10	31	23	43769	135	0.12	0.19	0.19	0.21	0.13	0.12	0.13	0.15	0.21	0.17	0.19	0.17	23.59	26.19	24.89
2019	11	1	23	43770	136	0.13	0.19	0.19	0.21	0.13	0.12	0.12	0.15	0.21	0.17	0.19	0.17	23.73	26.17	24.95
2019	11	2	23	43771	137	0.14	0.19	0.19	0.21	0.13	0.11	0.13	0.15	0.21	0.17	0.19	0.17	23.8	26.28	25.04
2019	11	3	23	43772	138	0.15	0.19	0.19	0.21	0.13	0.11	0.16	0.15	0.21	0.17	0.19	0.17	23.86	26.51	25.19
2019	11	4	23	43773	139	0.14	0.19	0.19	0.21	0.13	0.11	0.15	0.15	0.21	0.17	0.19	0.17	23.84	26.43	25.13
2019	11	5	23	43774	140	0.14	0.19	0.19	0.21	0.13	0.11	0.14	0.15	0.21	0.17	0.19	0.17	23.8	26.4	25.1
2019	11	6	23	43775	141	0.12	0.19	0.19	0.21	0.13	0.11	0.12	0.15	0.21	0.17	0.19	0.17	23.63	26.13	24.88
2019	11	7	23	43776	142	0.09	0.19	0.19	0.21	0.13	0.11	0.11	0.15	0.21	0.17	0.19	0.17	23.38	25.93	24.66
2019	11	8	23	43777	143	0.13	0.19	0.19	0.21	0.13	0.11	0.13	0.14	0.21	0.17	0.19	0.17	23.74	26.08	24.91
2019	11	9	23	43778	144	0.16	0.19	0.19	0.21	0.13	0.11	0.16	0.15	0.21	0.17	0.19	0.17	24.04	26.45	25.25
2019	11	10	23	43779	145	0.16	0.19	0.19	0.21	0.13	0.11	0.16	0.15	0.21	0.17	0.19	0.17	24	26.45	25.22
2019	11	11	23	43780	146	0.15	0.19	0.19	0.21	0.13	0.11	0.14	0.15	0.21	0.17	0.19	0.17	23.91	26.27	25.09
2019	11	12	23	43781	147	0.14	0.19	0.19	0.21	0.13	0.11	0.14	0.15	0.21	0.17	0.19	0.17	23.83	26.19	25.01

2019	11	13	23	43782	148	0.14	0.19	0.19	0.21	0.13	0.11	0.14	0.15	0.21	0.17	0.19	0.17	23.85	26.24	25.04
2019	11	14	23	43783	149	0.14	0.19	0.19	0.21	0.13	0.11	0.14	0.15	0.21	0.17	0.19	0.17	23.88	26.24	25.06
2019	11	15	23	43784	150	0.14	0.19	0.19	0.21	0.13	0.11	0.15	0.15	0.21	0.17	0.19	0.17	23.9	26.28	25.09
2019	11	16	23	43785	151	0.15	0.19	0.19	0.21	0.13	0.11	0.16	0.15	0.21	0.17	0.19	0.17	24	26.4	25.2
2019	11	17	23	43786	152	0.15	0.19	0.19	0.21	0.13	0.11	0.17	0.15	0.21	0.17	0.19	0.17	24.03	26.5	25.26
2019	11	18	23	43787	153	0.16	0.19	0.19	0.21	0.13	0.11	0.18	0.15	0.21	0.17	0.19	0.17	24.11	26.68	25.4
2019	11	19	23	43788	154	0.16	0.19	0.19	0.21	0.13	0.11	0.18	0.16	0.21	0.17	0.19	0.17	24.11	26.85	25.48
2019	11	20	23	43789	155	0.16	0.19	0.19	0.21	0.13	0.11	0.18	0.16	0.21	0.17	0.19	0.17	24.1	26.86	25.48
2019	11	21	23	43790	156	0.15	0.19	0.19	0.21	0.13	0.11	0.17	0.16	0.21	0.17	0.19	0.17	24.04	26.7	25.37
2019	11	22	23	43791	157	0.14	0.19	0.19	0.21	0.13	0.11	0.14	0.16	0.21	0.17	0.19	0.17	23.98	26.42	25.2
2019	11	23	23	43792	158	0.14	0.19	0.19	0.21	0.13	0.11	0.15	0.15	0.21	0.17	0.19	0.17	23.96	26.44	25.2
2019	11	24	23	43793	159	0.15	0.19	0.19	0.21	0.13	0.11	0.16	0.15	0.21	0.17	0.19	0.17	24.01	26.5	25.26
2019	11	25	23	43794	160	0.15	0.19	0.19	0.21	0.13	0.11	0.16	0.15	0.21	0.17	0.19	0.17	24.06	26.5	25.28
2019	11	26	23	43795	161	0.13	0.19	0.19	0.21	0.13	0.11	0.12	0.15	0.21	0.17	0.19	0.17	23.92	26.12	25.02
2019	11	27	23	43796	162	0.09	0.19	0.19	0.21	0.13	0.11	0.11	0.14	0.21	0.17	0.19	0.17	23.53	25.7	24.61
2019	11	28	23	43797	163	0.09	0.19	0.19	0.21	0.13	0.11	0.11	0.12	0.21	0.17	0.19	0.17	23.46	25.35	24.41
2019	11	29	23	43798	164	0.09	0.19	0.19	0.21	0.13	0.11	0.11	0.12	0.21	0.17	0.19	0.17	23.31	25.31	24.31
2019	11	30	23	43799	165	0.09	0.16	0.19	0.21	0.13	0.11	0.11	0.12	0.21	0.17	0.19	0.17	22.78	25.23	24.01
2019	12	1	23	43800	166	0.08	0.13	0.19	0.21	0.13	0.11	0.1	0.11	0.21	0.16	0.19	0.17	22.09	25.02	23.55
2019	12	2	23	43801	167	0.08	0.12	0.19	0.21	0.13	0.11	0.1	0.11	0.21	0.16	0.19	0.17	21.91	24.93	23.42
2019	12	3	23	43802	168	0.08	0.12	0.19	0.21	0.13	0.11	0.1	0.11	0.21	0.16	0.19	0.17	21.92	24.96	23.44
2019	12	4	23	43803	169	0.09	0.12	0.19	0.21	0.13	0.11	0.11	0.11	0.21	0.16	0.19	0.17	21.88	24.99	23.43
2019	12	5	23	43804	170	0.09	0.12	0.19	0.21	0.13	0.11	0.11	0.11	0.21	0.16	0.19	0.17	21.9	24.98	23.44
2019	12	6	23	43805	171	0.08	0.12	0.19	0.21	0.13	0.11	0.1	0.11	0.21	0.16	0.19	0.17	21.75	24.9	23.32
2019	12	7	23	43806	172	0.08	0.12	0.19	0.21	0.13	0.11	0.1	0.11	0.21	0.16	0.19	0.17	21.76	24.86	23.31
2019	12	8	23	43807	173	0.08	0.12	0.19	0.21	0.13	0.11	0.1	0.11	0.2	0.16	0.19	0.17	21.68	24.81	23.24
2019	12	9	23	43808	174	0.08	0.12	0.18	0.21	0.13	0.11	0.1	0.11	0.2	0.16	0.19	0.17	21.71	24.74	23.23
2019	12	10	23	43809	175	0.08	0.12	0.18	0.21	0.13	0.11	0.1	0.11	0.2	0.16	0.19	0.17	21.62	24.67	23.14
2019	12	11	23	43810	176	0.08	0.12	0.18	0.21	0.13	0.11	0.1	0.11	0.2	0.16	0.19	0.17	21.56	24.57	23.07
2019	12	12	23	43811	177	0.08	0.12	0.18	0.21	0.13	0.11	0.1	0.11	0.2	0.16	0.19	0.17	21.6	24.47	23.03

2019	12	13	23	43812	178	0.08	0.12	0.18	0.21	0.12	0.11	0.1	0.11	0.2	0.15	0.19	0.17	21.58	24.31	22.94
2019	12	14	23	43813	179	0.08	0.12	0.18	0.21	0.12	0.11	0.1	0.11	0.19	0.15	0.19	0.16	21.54	23.96	22.75
2019	12	15	23	43814	180	0.08	0.12	0.18	0.21	0.12	0.11	0.1	0.11	0.18	0.14	0.19	0.16	21.48	23.61	22.54
2019	12	16	23	43815	181	0.09	0.12	0.18	0.21	0.12	0.11	0.1	0.11	0.18	0.13	0.19	0.16	21.51	23.25	22.38
2019	12	17	23	43816	182	0.09	0.12	0.18	0.21	0.12	0.11	0.1	0.11	0.17	0.13	0.19	0.16	21.45	22.99	22.22
2019	12	18	23	43817	183	0.09	0.12	0.18	0.21	0.12	0.11	0.11	0.11	0.17	0.12	0.19	0.16	21.49	22.83	22.16
2019	12	19	23	43818	184	0.09	0.12	0.18	0.21	0.12	0.11	0.1	0.11	0.16	0.12	0.19	0.16	21.46	22.66	22.06
2019	12	20	23	43819	185	0.09	0.12	0.18	0.21	0.12	0.11	0.1	0.11	0.16	0.12	0.19	0.16	21.49	22.48	21.98
2019	12	21	23	43820	186	0.08	0.12	0.18	0.21	0.12	0.11	0.1	0.11	0.16	0.11	0.19	0.16	21.57	22.28	21.92
2019	12	22	23	43821	187	0.09	0.12	0.18	0.21	0.12	0.11	0.11	0.11	0.15	0.11	0.19	0.16	21.51	22.17	21.84
2019	12	23	23	43822	188	0.08	0.12	0.18	0.21	0.12	0.11	0.11	0.11	0.15	0.11	0.19	0.16	21.47	22.06	21.76
2019	12	24	23	43823	189	0.08	0.12	0.18	0.21	0.12	0.11	0.1	0.11	0.15	0.11	0.19	0.16	21.48	21.93	21.7
2019	12	25	23	43824	190	0.08	0.12	0.18	0.21	0.12	0.11	0.11	0.11	0.15	0.1	0.19	0.16	21.48	21.81	21.64
2019	12	26	23	43825	191	0.08	0.12	0.18	0.21	0.12	0.11	0.1	0.11	0.15	0.1	0.18	0.16	21.48	21.67	21.58
2019	12	27	23	43826	192	0.08	0.12	0.18	0.21	0.12	0.11	0.1	0.11	0.14	0.1	0.18	0.16	21.43	21.45	21.44
2019	12	28	23	43827	193	0.08	0.12	0.18	0.21	0.12	0.11	0.1	0.11	0.14	0.1	0.18	0.16	21.38	21.3	21.34
2019	12	29	23	43828	194	0.08	0.12	0.18	0.21	0.12	0.11	0.1	0.11	0.14	0.09	0.18	0.16	21.36	21.2	21.28
2019	12	30	23	43829	195	0.08	0.12	0.18	0.21	0.12	0.11	0.1	0.11	0.14	0.09	0.18	0.16	21.34	21.14	21.24
2019	12	31	23	43830	196	0.08	0.12	0.18	0.21	0.12	0.11	0.1	0.11	0.14	0.09	0.18	0.16	21.33	21.09	21.21
2020	1	1	23	43831	197	0.08	0.12	0.18	0.21	0.12	0.11	0.1	0.11	0.14	0.09	0.18	0.16	21.32	21.11	21.22
2020	1	2	23	43832	198	0.08	0.12	0.18	0.21	0.12	0.11	0.1	0.11	0.14	0.09	0.18	0.16	21.29	21.08	21.19
2020	1	3	23	43833	199	0.08	0.12	0.18	0.21	0.12	0.11	0.1	0.11	0.14	0.09	0.18	0.16	21.27	21.09	21.18
2020	1	4	23	43834	200	0.08	0.12	0.18	0.21	0.12	0.11	0.1	0.11	0.14	0.09	0.18	0.16	21.23	21.07	21.15
2020	1	5	23	43835	201	0.08	0.12	0.17	0.21	0.12	0.11	0.1	0.11	0.14	0.09	0.18	0.16	21.12	21.03	21.07
2020	1	6	23	43836	202	0.08	0.12	0.17	0.2	0.12	0.11	0.1	0.11	0.13	0.09	0.18	0.16	20.87	20.94	20.9
2020	1	7	23	43837	203	0.08	0.12	0.16	0.2	0.12	0.11	0.1	0.11	0.13	0.09	0.18	0.16	20.42	20.79	20.61
2020	1	8	23	43838	204	0.08	0.12	0.14	0.19	0.12	0.11	0.1	0.11	0.13	0.09	0.18	0.16	19.98	20.64	20.31
2020	1	9	23	43839	205	0.08	0.12	0.14	0.19	0.12	0.11	0.1	0.11	0.13	0.08	0.18	0.16	19.81	20.6	20.2
2020	1	10	23	43840	206	0.08	0.12	0.14	0.19	0.12	0.11	0.1	0.11	0.13	0.08	0.18	0.16	19.7	20.54	20.12
2020	1	11	23	43841	207	0.08	0.12	0.13	0.19	0.12	0.11	0.1	0.11	0.13	0.08	0.18	0.16	19.6	20.47	20.04

2020	1	12	23	43842	208	0.08	0.12	0.13	0.19	0.12	0.11	0.1	0.11	0.13	0.08	0.18	0.16	19.53	20.43	19.98
2020	1	13	23	43843	209	0.08	0.12	0.13	0.19	0.12	0.11	0.1	0.11	0.13	0.08	0.18	0.16	19.46	20.34	19.9
2020	1	14	23	43844	210	0.08	0.12	0.13	0.18	0.12	0.11	0.1	0.11	0.12	0.08	0.18	0.16	19.35	20.23	19.79
2020	1	15	23	43845	211	0.08	0.12	0.12	0.18	0.12	0.11	0.1	0.1	0.12	0.08	0.18	0.16	19.21	20.04	19.63
2020	1	16	23	43846	212	0.08	0.11	0.12	0.18	0.12	0.11	0.1	0.1	0.12	0.07	0.18	0.16	19.05	19.89	19.47
2020	1	17	23	43847	213	0.08	0.11	0.12	0.18	0.12	0.11	0.1	0.1	0.12	0.07	0.18	0.16	18.98	19.85	19.41
2020	1	18	23	43848	214	0.08	0.11	0.12	0.18	0.12	0.11	0.1	0.1	0.12	0.07	0.18	0.16	18.96	19.83	19.39
2020	1	19	23	43849	215	0.08	0.11	0.12	0.18	0.12	0.11	0.1	0.1	0.12	0.07	0.18	0.16	18.93	19.82	19.38
2020	1	20	23	43850	216	0.08	0.11	0.12	0.18	0.12	0.11	0.1	0.1	0.12	0.07	0.18	0.16	18.92	19.81	19.37
2020	1	21	23	43851	217	0.08	0.11	0.12	0.18	0.12	0.11	0.1	0.1	0.12	0.07	0.18	0.16	18.91	19.84	19.38
2020	1	22	23	43852	218	0.08	0.11	0.12	0.18	0.12	0.11	0.1	0.11	0.12	0.07	0.18	0.16	18.92	19.86	19.39
2020	1	23	23	43853	219	0.08	0.12	0.12	0.18	0.12	0.11	0.1	0.11	0.12	0.07	0.18	0.16	18.94	19.91	19.42
2020	1	24	23	43854	220	0.08	0.12	0.12	0.18	0.12	0.11	0.1	0.11	0.12	0.07	0.18	0.16	18.95	19.94	19.45
2020	1	25	23	43855	221	0.08	0.12	0.12	0.18	0.12	0.11	0.1	0.11	0.12	0.08	0.18	0.16	18.97	19.97	19.47
2020	1	26	23	43856	222	0.08	0.12	0.12	0.18	0.12	0.11	0.1	0.11	0.12	0.08	0.18	0.16	18.98	19.98	19.48
2020	1	27	23	43857	223	0.08	0.12	0.12	0.18	0.12	0.11	0.1	0.11	0.12	0.08	0.18	0.16	18.99	19.99	19.49
2020	1	28	23	43858	224	0.08	0.12	0.12	0.18	0.12	0.11	0.11	0.11	0.12	0.08	0.18	0.16	19.01	20.03	19.52
2020	1	29	23	43859	225	0.08	0.12	0.12	0.18	0.12	0.11	0.1	0.11	0.12	0.08	0.18	0.16	19.01	20.04	19.53
2020	1	30	23	43860	226	0.08	0.12	0.12	0.18	0.12	0.11	0.1	0.11	0.12	0.08	0.18	0.16	19.01	20.03	19.52
2020	1	31	23	43861	227	0.08	0.12	0.12	0.18	0.12	0.11	0.11	0.11	0.12	0.08	0.18	0.16	19.03	20.05	19.54
2020	2	1	23	43862	228	0.08	0.12	0.12	0.18	0.12	0.11	0.11	0.11	0.12	0.08	0.18	0.16	19.06	20.1	19.58
2020	2	2	23	43863	229	0.09	0.12	0.12	0.18	0.12	0.11	0.11	0.11	0.12	0.08	0.18	0.16	19.12	20.2	19.66
2020	2	3	23	43864	230							0.11	0.11	0.12	0.08	0.18	0.16		20.18	19.64
2020	2	4	23	43865	231							0.11	0.11	0.12	0.08	0.18	0.16		20.09	19.55
2020	2	5	23	43866	232							0.11	0.11	0.12	0.08	0.18	0.16		20.03	19.49
2020	2	6	23	43867	233							0.11	0.11	0.12	0.08	0.18	0.16		20.06	19.52
2020	2	7	23	43868	234							0.11	0.11	0.12	0.08	0.18	0.16		20.11	19.57
2020	2	8	23	43869	235							0.11	0.11	0.12	0.08	0.18	0.16		20.15	19.61
2020	2	9	23	43870	236							0.11	0.11	0.12	0.08	0.18	0.16		20.14	19.6
2020	2	10	23	43871	237							0.11	0.11	0.12	0.08	0.18	0.16		20.12	19.58

2020	2	11	23	43872	238							0.11	0.11	0.12	0.08	0.18	0.16		20.15	19.61
2020	2	12	23	43873	239							0.11	0.11	0.12	0.08	0.18	0.16		20.17	19.63
2020	2	13	23	43874	240							0.11	0.11	0.12	0.08	0.18	0.16		20.17	19.63
2020	2	14	23	43875	241							0.11	0.11	0.12	0.08	0.18	0.16		20.15	19.61
2020	2	15	23	43876	242							0.11	0.11	0.12	0.08	0.18	0.16		20.16	19.61
2020	2	16	23	43877	243							0.11	0.11	0.12	0.08	0.18	0.16		20.16	19.62
2020	2	17	23	43878	244							0.11	0.11	0.12	0.08	0.18	0.16		20.16	19.62
2020	2	18	23	43879	245							0.11	0.11	0.12	0.08	0.18	0.16		20.13	19.59
2020	2	19	23	43880	246							0.11	0.11	0.12	0.08	0.18	0.16		20.09	19.54
2020	2	20	23	43881	247							0.11	0.11	0.12	0.08	0.18	0.16		20.05	19.51
2020	2	21	23	43882	248							0.11	0.11	0.12	0.08	0.18	0.16		20.04	19.5
2020	2	22	23	43883	249							0.11	0.11	0.12	0.08	0.18	0.16		20.05	19.51
2020	2	23	23	43884	250							0.11	0.11	0.12	0.08	0.18	0.16		20.06	19.52
2020	2	24	23	43885	251							0.11	0.11	0.12	0.08	0.18	0.16		20.07	19.53
2020	2	25	23	43886	252							0.11	0.11	0.12	0.08	0.18	0.16		20.03	19.49
2020	2	26	23	43887	253							0.11	0.11	0.12	0.08	0.18	0.16		20.01	19.46
2020	2	27	23	43888	254							0.11	0.11	0.12	0.08	0.18	0.16		20.02	19.48
2020	2	28	23	43889	255							0.11	0.11	0.12	0.08	0.18	0.16		20.07	19.53
2020	2	29	23	43890	256							0.11	0.11	0.12	0.08	0.18	0.16		20.11	19.57
2020	3	1	23	43891	257							0.11	0.11	0.12	0.08	0.18	0.16		20.15	19.61
2020	3	2	23	43892	258							0.11	0.11	0.12	0.08	0.18	0.16		20.19	19.65
2020	3	3	23	43893	259							0.11	0.11	0.12	0.08	0.18	0.16		20.21	19.67
2020	3	4	23	43894	260							0.11	0.11	0.12	0.08	0.18	0.16		20.26	19.72
2020	3	5	23	43895	261							0.11	0.11	0.12	0.08	0.18	0.16		20.28	19.74
2020	3	6	23	43896	262							0.11	0.11	0.12	0.08	0.18	0.16		20.27	19.73
2020	3	7	23	43897	263							0.11	0.11	0.12	0.08	0.18	0.16		20.25	19.7
2020	3	8	23	43898	264							0.11	0.11	0.12	0.08	0.18	0.16		20.2	19.66
2020	3	9	23	43899	265							0.11	0.11	0.12	0.08	0.18	0.16		20.18	19.64
2020	3	10	23	43900	266							0.11	0.11	0.12	0.08	0.18	0.16		20.17	19.63
2020	3	11	23	43901	267							0.11	0.11	0.12	0.08	0.18	0.16		20.15	19.61

2020	3	12	23	43902	268							0.11	0.11	0.12	0.08	0.18	0.16		20.15	19.61
2020	3	13	23	43903	269							0.11	0.11	0.12	0.08	0.18	0.16		20.16	19.62
2020	3	14	23	43904	270							0.11	0.11	0.12	0.08	0.18	0.16		20.09	19.55
2020	3	15	23	43905	271							0.11	0.11	0.12	0.08	0.18	0.16		20.02	19.47
2020	3	16	23	43906	272							0.11	0.11	0.12	0.07	0.18	0.16		19.95	19.41
2020	3	17	23	43907	273							0.11	0.11	0.12	0.07	0.18	0.16		19.94	19.4
2020	3	18	23	43908	274							0.11	0.11	0.12	0.07	0.18	0.16		19.95	19.4
2020	3	19	23	43909	275							0.11	0.11	0.12	0.07	0.18	0.16		19.92	19.37
2020	3	20	23	43910	276							0.11	0.11	0.12	0.07	0.18	0.16		19.89	19.35
2020	3	21	23	43911	277							0.11	0.11	0.12	0.07	0.18	0.16		19.86	19.32
2020	3	22	23	43912	278							0.11	0.11	0.12	0.07	0.18	0.16		19.87	19.33
2020	3	23	23	43913	279							0.11	0.11	0.12	0.07	0.18	0.16		19.89	19.35
2020	3	24	23	43914	280							0.11	0.11	0.12	0.07	0.18	0.16		19.94	19.39
2020	3	25	23	43915	281							0.11	0.11	0.12	0.07	0.18	0.16		19.98	19.43
2020	3	26	23	43916	282							0.11	0.11	0.12	0.07	0.18	0.16		20	19.46
2020	3	27	23	43917	283							0.11	0.11	0.12	0.07	0.18	0.16		20.02	19.48
2020	3	28	23	43918	284							0.11	0.11	0.12	0.08	0.18	0.16		20.09	19.55
2020	3	29	23	43919	285							0.11	0.11	0.12	0.08	0.18	0.16		20.13	19.59
2020	3	30	23	43920	286							0.11	0.11	0.12	0.08	0.18	0.16		20.14	19.6
2020	3	31	23	43921	287							0.11	0.11	0.12	0.08	0.18	0.16		20.12	19.58
2020	4	1	23	43922	288							0.11	0.11	0.12	0.08	0.18	0.16		20.12	19.58
2020	4	2	23	43923	289							0.11	0.11	0.12	0.08	0.18	0.16		20.11	19.57
2020	4	3	23	43924	290							0.11	0.11	0.12	0.08	0.18	0.16		20.06	19.52
2020	4	4	23	43925	291							0.11	0.11	0.12	0.08	0.18	0.16		20.03	19.49
2020	4	5	23	43926	292							0.11	0.11	0.12	0.08	0.18	0.16		20.02	19.47
2020	4	6	23	43927	293							0.11	0.11	0.12	0.08	0.18	0.16		20.02	19.48
2020	4	7	23	43928	294							0.11	0.11	0.12	0.08	0.18	0.16		20.04	19.5
2020	4	8	23	43929	295							0.11	0.11	0.12	0.08	0.18	0.16		20.07	19.53
2020	4	9	23	43930	296							0.11	0.11	0.12	0.08	0.18	0.16		20.12	19.57
2020	4	10	23	43931	297							0.11	0.11	0.12	0.08	0.18	0.16		20.18	19.64

2020	4	11	23	43932	298							0.11	0.12	0.12	0.08	0.18	0.16		20.29	19.75
2020	4	12	23	43933	299							0.11	0.12	0.12	0.08	0.18	0.16		20.37	19.82
2020	4	13	23	43934	300							0.11	0.12	0.12	0.08	0.18	0.16		20.36	19.82
2020	4	14	23	43935	301							0.11	0.12	0.12	0.08	0.18	0.16		20.37	19.83
2020	4	15	23	43936	302							0.12	0.12	0.12	0.08	0.18	0.16		20.51	19.96
2020	4	16	23	43937	303							0.13	0.12	0.13	0.08	0.18	0.16		20.66	20.12
2020	4	17	23	43938	304							0.16	0.12	0.13	0.08	0.18	0.16		21.09	20.55
2020	4	18	23	43939	305							0.19	0.12	0.13	0.08	0.18	0.16		21.52	20.98
2020	4	19	23	43940	306							0.2	0.13	0.13	0.08	0.18	0.19		22.56	22.02
2020	4	20	23	43941	307							0.21	0.18	0.13	0.09	0.19	0.21		24.46	23.92
2020	4	21	23	43942	308							0.23	0.2	0.13	0.09	0.19	0.19		25.23	24.68
2020	4	22	23	43943	309							0.25	0.22	0.14	0.09	0.19	0.19		25.7	25.16
2020	4	23	23	43944	310							0.25	0.22	0.14	0.1	0.19	0.19		25.91	25.36
2020	4	24	23	43945	311							0.25	0.22	0.15	0.11	0.19	0.18		26.31	25.76
2020	4	25	23	43946	312							0.24	0.22	0.17	0.12	0.19	0.18		26.89	26.35
2020	4	26	23	43947	313							0.24	0.22	0.21	0.17	0.19	0.18		29.27	28.73
2020	4	27	23	43948	314							0.23	0.21	0.3	0.26	0.19	0.18		33.37	32.83
2020	4	28	23	43949	315							0.23	0.21	0.3	0.26	0.19	0.18		33.52	32.98
2020	4	29	23	43950	316							0.22	0.2	0.3	0.26	0.19	0.18		33.38	32.84
2020	4	30	23	43951	317							0.21	0.2	0.3	0.26	0.2	0.18		33.16	32.61
2020	5	1	23	43952	318							0.21	0.2	0.3	0.25	0.2	0.18		32.98	32.44
2020	5	2	23	43953	319							0.2	0.19	0.29	0.25	0.2	0.18		32.79	32.25
2020	5	3	23	43954	320							0.19	0.19	0.29	0.25	0.2	0.18		32.49	31.95
2020	5	4	23	43955	321							0.21	0.19	0.29	0.25	0.2	0.18		32.82	32.28
2020	5	5	23	43956	322							0.2	0.19	0.29	0.25	0.21	0.18		32.75	32.21
2020	5	6	23	43957	323							0.19	0.18	0.28	0.24	0.21	0.18		32.47	31.93
2020	5	7	23	43958	324							0.18	0.18	0.28	0.24	0.21	0.18		32.15	31.61
2020	5	8	23	43959	325							0.18	0.18	0.28	0.24	0.21	0.18		32.03	31.49
2020	5	9	23	43960	326							0.18	0.17	0.28	0.23	0.21	0.18		31.91	31.37
2020	5	10	23	43961	327							0.18	0.17	0.27	0.23	0.21	0.18		31.74	31.2

2020	5	11	23	43962	328							0.17	0.17	0.27	0.23	0.21	0.18		31.6	31.06
2020	5	12	23	43963	329							0.17	0.17	0.27	0.23	0.21	0.18		31.45	30.91
2020	5	13	23	43964	330							0.16	0.17	0.27	0.23	0.21	0.18		31.31	30.77
2020	5	14	23	43965	331							0.16	0.17	0.27	0.22	0.21	0.18		31.14	30.6
2020	5	15	23	43966	332							0.16	0.17	0.26	0.22	0.21	0.18		31.02	30.48
2020	5	16	23	43967	333							0.16	0.17	0.26	0.22	0.21	0.18		30.88	30.34
2020	5	17	23	43968	334							0.15	0.17	0.26	0.22	0.21	0.18		30.73	30.18
2020	5	18	23	43969	335							0.15	0.16	0.26	0.22	0.21	0.18		30.55	30.01
2020	5	19	23	43970	336							0.14	0.16	0.26	0.22	0.21	0.18		30.39	29.85
2020	5	20	23	43971	337	0.12	0.27	0.25	0.25	0.15	0.16	0.14	0.16	0.26	0.22	0.21	0.18	29.45	30.21	29.83
2020	5	21	23	43972	338	0.16	0.27	0.25	0.25	0.14	0.16	0.18	0.17	0.26	0.21	0.21	0.18	29.78	30.7	30.24
2020	5	22	23	43973	339	0.19	0.27	0.26	0.25	0.15	0.16	0.21	0.19	0.26	0.22	0.21	0.18	30.38	31.77	31.07
2020	5	23	23	43974	340	0.17	0.27	0.26	0.25	0.15	0.16	0.2	0.19	0.26	0.22	0.21	0.18	30.51	31.73	31.12
2020	5	24	23	43975	341	0.16	0.27	0.26	0.25	0.15	0.16	0.19	0.18	0.26	0.22	0.21	0.18	30.53	31.52	31.02
2020	5	25	23	43976	342	0.15	0.27	0.26	0.25	0.15	0.17	0.18	0.17	0.26	0.22	0.21	0.18	30.39	31.3	30.84
2020	5	26	23	43977	343	0.15	0.27	0.26	0.25	0.15	0.17	0.17	0.17	0.26	0.22	0.21	0.18	30.27	31.1	30.68
2020	5	27	23	43978	344	0.14	0.27	0.26	0.25	0.15	0.17	0.16	0.17	0.26	0.22	0.21	0.18	30.18	30.93	30.55
2020	5	28	23	43979	345	0.14	0.27	0.26	0.25	0.15	0.17	0.16	0.17	0.26	0.22	0.21	0.19	30.13	30.83	30.48
2020	5	29	23	43980	346	0.13	0.27	0.25	0.25	0.15	0.17	0.16	0.16	0.26	0.22	0.21	0.19	30.02	30.7	30.36
2020	5	30	23	43981	347	0.12	0.27	0.25	0.25	0.15	0.16	0.15	0.16	0.26	0.21	0.21	0.19	29.83	30.48	30.16
2020	5	31	23	43982	348	0.14	0.27	0.25	0.25	0.15	0.16	0.16	0.16	0.25	0.21	0.21	0.19	29.87	30.6	30.23
2020	6	1	23	43983	349	0.19	0.28	0.26	0.25	0.15	0.17	0.22	0.2	0.26	0.22	0.21	0.19	30.99	32.48	31.73
2020	6	2	23	43984	350	0.17	0.27	0.26	0.25	0.15	0.17	0.19	0.18	0.26	0.22	0.22	0.19	30.93	32.01	31.47
2020	6	3	23	43985	351	0.16	0.27	0.26	0.25	0.15	0.17	0.19	0.18	0.26	0.22	0.22	0.19	30.86	31.85	31.35
2020	6	4	23	43986	352	0.16	0.27	0.26	0.25	0.15	0.17	0.18	0.17	0.26	0.22	0.22	0.19	30.76	31.7	31.23
2020	6	5	23	43987	353	0.15	0.27	0.26	0.25	0.15	0.17	0.18	0.17	0.26	0.22	0.19	0.19	30.64	30.38	30.51
2020	6	6	23	43988	354	0.16	0.27	0.26	0.25	0.15	0.17	0.19	0.18	0.26	0.22	0.19	0.19	30.76	30.58	30.67
2020	6	7	23	43989	355	0.2	0.27	0.26	0.25	0.15	0.18	0.23	0.2	0.26	0.22	0.19	0.19	31.43	31.88	31.65
2020	6	8	23	43990	356	0.18	0.28	0.26	0.25	0.16	0.18	0.22	0.2	0.27	0.23	0.19	0.19	31.69	31.99	31.84
2020	6	9	23	43991	357	0.17	0.27	0.26	0.25	0.16	0.19	0.2	0.18	0.27	0.23	0.2	0.2	31.6	31.54	31.57

2020	6	10	23	43992	358	0.16	0.27	0.26	0.25	0.16	0.19	0.19	0.18	0.27	0.22	0.2	0.2	31.41	31.2	31.31
2020	6	11	23	43993	359	0.15	0.27	0.26	0.25	0.16	0.19	0.18	0.17	0.26	0.22	0.2	0.2	31.22	30.93	31.08
2020	6	12	23	43994	360	0.15	0.27	0.26	0.25	0.15	0.18	0.17	0.17	0.26	0.22	0.2	0.2	31.07	30.75	30.91
2020	6	13	23	43995	361	0.14	0.27	0.26	0.25	0.15	0.18	0.18	0.17	0.26	0.22	0.2	0.2	30.94	30.73	30.83
2020	6	14	23	43996	362	0.18	0.27	0.26	0.25	0.15	0.18	0.21	0.19	0.26	0.22	0.2	0.2	31.26	31.34	31.3
2020	6	15	23	43997	363	0.18	0.27	0.26	0.25	0.15	0.18	0.22	0.19	0.26	0.22	0.2	0.2	31.36	31.56	31.46
2020	6	16	23	43998	364	0.17	0.27	0.26	0.25	0.15	0.18	0.2	0.19	0.26	0.22	0.2	0.2	31.26	31.38	31.32
2020	6	17	23	43999	365	0.16	0.27	0.26	0.25	0.15	0.18	0.19	0.18	0.26	0.22	0.2	0.2	31.11	31.12	31.12
2020	6	18	23	44000	366	0.16	0.27	0.26	0.25	0.15	0.18	0.19	0.18	0.26	0.22	0.2	0.2	31.01	31	31.01
2020	6	19	23	44001	367	0.15	0.27	0.26	0.25	0.15	0.18	0.17	0.17	0.26	0.22	0.2	0.2	30.82	30.7	30.76
2020	6	20	23	44002	368	0.13	0.26	0.26	0.25	0.15	0.18	0.16	0.17	0.26	0.22	0.2	0.2	30.55	30.37	30.46
2020	6	21	23	44003	369	0.12	0.26	0.26	0.25	0.15	0.18	0.15	0.16	0.26	0.22	0.2	0.2	30.29	30.1	30.2
2020	6	22	23	44004	370	0.12	0.26	0.25	0.25	0.15	0.18	0.14	0.16	0.26	0.21	0.2	0.2	30.12	29.87	29.99
2020	6	23	23	44005	371	0.11	0.26	0.25	0.25	0.15	0.18	0.13	0.15	0.25	0.21	0.2	0.2	29.85	29.55	29.7
2020	6	24	23	44006	372	0.11	0.26	0.25	0.25	0.15	0.17	0.13	0.15	0.25	0.21	0.2	0.2	29.65	29.37	29.51
2020	6	25	23	44007	373	0.1	0.26	0.25	0.24	0.15	0.17	0.13	0.15	0.25	0.21	0.2	0.2	29.53	29.29	29.41
2020	6	26	23	44008	374	0.1	0.26	0.25	0.24	0.15	0.17	0.13	0.14	0.25	0.21	0.2	0.2	29.31	29.13	29.22
2020	6	27	23	44009	375	0.1	0.25	0.24	0.24	0.15	0.17	0.14	0.14	0.25	0.21	0.2	0.2	29.16	29.23	29.2
2020	6	28	23	44010	376	0.1	0.25	0.24	0.24	0.15	0.17	0.15	0.14	0.25	0.21	0.2	0.2	29.14	29.31	29.22
2020	6	29	23	44011	377	0.11	0.25	0.24	0.24	0.15	0.17	0.17	0.14	0.25	0.21	0.2	0.2	29.16	29.41	29.28
2020	6	30	23	44012	378	0.14	0.25	0.24	0.24	0.15	0.17	0.18	0.15	0.25	0.21	0.2	0.2	29.47	29.54	29.5
2020	7	1	23	44013	379	0.19	0.26	0.25	0.24	0.15	0.17	0.23	0.19	0.25	0.21	0.2	0.2	30.28	31.09	30.69
2020	7	2	23	44014	380	0.17	0.26	0.25	0.25	0.15	0.17	0.21	0.19	0.25	0.21	0.2	0.2	30.56	31.01	30.78
2020	7	3	23	44015	381	0.16	0.26	0.25	0.25	0.15	0.18	0.19	0.18	0.25	0.21	0.2	0.2	30.46	30.67	30.56
2020	7	4	23	44016	382	0.15	0.26	0.25	0.25	0.15	0.18	0.18	0.17	0.25	0.21	0.2	0.2	30.32	30.35	30.34
2020	7	5	23	44017	383	0.14	0.26	0.25	0.24	0.15	0.18	0.17	0.17	0.25	0.21	0.2	0.2	30.2	30.15	30.18
2020	7	6	23	44018	384	0.13	0.26	0.25	0.24	0.15	0.18	0.16	0.16	0.25	0.21	0.2	0.2	30.09	29.91	30
2020	7	7	23	44019	385	0.13	0.26	0.25	0.24	0.15	0.18	0.16	0.16	0.25	0.21	0.2	0.2	30.04	29.82	29.93
2020	7	8	23	44020	386	0.19	0.26	0.25	0.25	0.16	0.18	0.23	0.2	0.25	0.21	0.2	0.2	30.95	31.35	31.15
2020	7	9	23	44021	387	0.17	0.26	0.25	0.25	0.16	0.18	0.22	0.2	0.25	0.21	0.2	0.2	30.9	31.37	31.13

2020	7	10	23	44022	388	0.19	0.26	0.25	0.25	0.16	0.18	0.22	0.2	0.26	0.21	0.2	0.2	31.23	31.37	31.3
2020	7	11	23	44023	389	0.16	0.26	0.25	0.25	0.16	0.18	0.19	0.18	0.26	0.21	0.2	0.2	31.01	30.85	30.93
2020	7	12	23	44024	390	0.15	0.26	0.25	0.25	0.16	0.18	0.18	0.18	0.25	0.21	0.2	0.2	30.81	30.47	30.64
2020	7	13	23	44025	391	0.14	0.26	0.25	0.24	0.16	0.18	0.17	0.17	0.25	0.21	0.2	0.2	30.6	30.12	30.36
2020	7	14	23	44026	392	0.12	0.26	0.25	0.24	0.16	0.18	0.15	0.16	0.25	0.21	0.19	0.19	30.3	29.71	30
2020	7	15	23	44027	393	0.11	0.25	0.24	0.24	0.16	0.18	0.14	0.15	0.25	0.21	0.19	0.19	29.93	29.27	29.6
2020	7	16	23	44028	394	0.13	0.25	0.24	0.24	0.16	0.17	0.16	0.16	0.25	0.21	0.19	0.19	29.92	29.48	29.7
2020	7	17	23	44029	395	0.18	0.25	0.24	0.24	0.16	0.17	0.21	0.19	0.25	0.21	0.19	0.19	30.49	30.71	30.6
2020	7	18	23	44030	396	0.16	0.25	0.24	0.24	0.16	0.17	0.19	0.18	0.25	0.21	0.19	0.19	30.33	30.25	30.29
2020	7	19	23	44031	397	0.15	0.25	0.24	0.24	0.16	0.17	0.17	0.17	0.25	0.21	0.19	0.19	30.23	29.94	30.09
2020	7	20	23	44032	398	0.13	0.25	0.24	0.24	0.16	0.17	0.16	0.16	0.25	0.21	0.19	0.19	30.03	29.58	29.81
2020	7	21	23	44033	399	0.12	0.25	0.24	0.24	0.16	0.17	0.14	0.16	0.25	0.21	0.19	0.19	29.74	29.23	29.49
2020	7	22	23	44034	400	0.15	0.25	0.24	0.24	0.16	0.17	0.17	0.15	0.25	0.21	0.19	0.19	29.9	29.4	29.65
2020	7	23	23	44035	401	0.17	0.25	0.24	0.24	0.16	0.17	0.2	0.17	0.25	0.21	0.19	0.19	30.18	29.94	30.06
2020	7	24	23	44036	402	0.18	0.25	0.24	0.24	0.16	0.17	0.21	0.19	0.25	0.21	0.19	0.19	30.37	30.49	30.43
2020	7	25	23	44037	403	0.16	0.25	0.24	0.24	0.16	0.17	0.19	0.18	0.25	0.21	0.19	0.19	30.22	30.06	30.14
2020	7	26	23	44038	404	0.15	0.25	0.24	0.24	0.16	0.17	0.17	0.17	0.25	0.2	0.19	0.19	30.01	29.63	29.82
2020	7	27	23	44039	405	0.12	0.25	0.24	0.24	0.16	0.17	0.15	0.16	0.25	0.2	0.19	0.19	29.55	29.07	29.31
2020	7	28	23	44040	406	0.11	0.24	0.23	0.24	0.16	0.17	0.13	0.15	0.24	0.2	0.19	0.19	29.06	28.65	28.85
2020	7	29	23	44041	407	0.11	0.24	0.23	0.23	0.16	0.17	0.13	0.14	0.24	0.2	0.19	0.19	28.69	28.41	28.55
2020	7	30	23	44042	408	0.1	0.24	0.22	0.23	0.16	0.16	0.12	0.14	0.24	0.2	0.19	0.19	28.38	28.21	28.29
2020	7	31	23	44043	409	0.1	0.23	0.22	0.23	0.16	0.16	0.12	0.14	0.24	0.19	0.19	0.19	28.04	27.99	28.01
2020	8	1	23	44044	410	0.1	0.23	0.21	0.23	0.16	0.16	0.12	0.14	0.23	0.19	0.19	0.19	27.66	27.76	27.71
2020	8	2	23	44045	411	0.1	0.22	0.21	0.22	0.15	0.16	0.12	0.14	0.23	0.19	0.19	0.19	27.27	27.53	27.4
2020	8	3	23	44046	412	0.1	0.22	0.21	0.22	0.15	0.16	0.12	0.14	0.23	0.19	0.19	0.19	27.04	27.41	27.23
2020	8	4	23	44047	413	0.1	0.22	0.21	0.22	0.15	0.16	0.12	0.14	0.23	0.18	0.19	0.19	26.97	27.35	27.16
2020	8	5	23	44048	414	0.1	0.21	0.2	0.22	0.15	0.16	0.12	0.13	0.22	0.18	0.19	0.19	26.68	27.19	26.94
2020	8	6	23	44049	415	0.1	0.21	0.2	0.22	0.15	0.15	0.12	0.13	0.22	0.18	0.19	0.19	26.26	26.98	26.62
2020	8	7	23	44050	416	0.12	0.2	0.2	0.22	0.15	0.15	0.15	0.14	0.22	0.18	0.19	0.19	26.34	27.26	26.8
2020	8	8	23	44051	417	0.16	0.21	0.2	0.22	0.15	0.15	0.19	0.14	0.22	0.18	0.19	0.19	26.86	27.82	27.34

2020	8	9	23	44052	418	0.15	0.21	0.2	0.22	0.15	0.15	0.17	0.15	0.22	0.18	0.19	0.19	26.79	27.77	27.28
2020	8	10	23	44053	419	0.13	0.2	0.2	0.22	0.15	0.15	0.14	0.14	0.22	0.18	0.19	0.19	26.43	27.27	26.85
2020	8	11	23	44054	420	0.11	0.2	0.19	0.22	0.15	0.15	0.12	0.14	0.22	0.17	0.19	0.19	25.99	26.89	26.44
2020	8	12	23	44055	421	0.14	0.2	0.19	0.22	0.15	0.15	0.17	0.14	0.22	0.17	0.19	0.19	26.31	27.34	26.82
2020	8	13	23	44056	422	0.14	0.2	0.19	0.22	0.15	0.15	0.16	0.14	0.22	0.18	0.19	0.19	26.42	27.32	26.87
2020	8	14	23	44057	423	0.12	0.2	0.19	0.22	0.15	0.15	0.14	0.14	0.22	0.17	0.19	0.19	26.15	27.01	26.58
2020	8	15	23	44058	424	0.11	0.19	0.19	0.22	0.15	0.15	0.13	0.14	0.21	0.17	0.19	0.19	25.74	26.76	26.25
2020	8	16	23	44059	425	0.1	0.19	0.19	0.21	0.15	0.15	0.12	0.14	0.21	0.17	0.19	0.19	25.35	26.56	25.96
2020	8	17	23	44060	426	0.1	0.17	0.18	0.21	0.15	0.15	0.12	0.13	0.21	0.17	0.19	0.19	24.9	26.31	25.61
2020	8	18	23	44061	427	0.1	0.16	0.18	0.21	0.15	0.14	0.12	0.13	0.21	0.16	0.19	0.19	24.56	26.11	25.34
2020	8	19	23	44062	428	0.1	0.16	0.18	0.21	0.15	0.14	0.12	0.13	0.2	0.16	0.19	0.19	24.25	25.89	25.07
2020	8	20	23	44063	429	0.1	0.15	0.18	0.21	0.15	0.14	0.12	0.13	0.2	0.16	0.19	0.19	24.02	25.73	24.87
2020	8	21	23	44064	430	0.15	0.15	0.18	0.21	0.15	0.14	0.18	0.13	0.19	0.14	0.19	0.19	24.59	25.79	25.19
2020	8	22	23	44065	431	0.17	0.15	0.18	0.21	0.15	0.14							24.9		
2020	8	23	23	44066	432	0.17	0.16	0.18	0.21	0.15	0.14							25.12		
2020	8	24	23	44067	433	0.15	0.17	0.18	0.21	0.15	0.14							25.17		
2020	8	25	23	44068	434	0.16	0.17	0.18	0.21	0.15	0.14							25.35		
2020	8	26	23	44069	435	0.16	0.18	0.18	0.21	0.15	0.14							25.47		
2020	8	27	23	44070	436	0.15	0.18	0.18	0.21	0.15	0.14							25.46		
2020	8	28	23	44071	437	0.13	0.18	0.18	0.21	0.15	0.14							25.22		
2020	8	29	23	44072	438	0.11	0.17	0.18	0.21	0.15	0.14							24.83		
2020	8	30	23	44073	439	0.1	0.16	0.18	0.21	0.15	0.14							24.35		
2020	8	31	23	44074	440	0.1	0.15	0.18	0.21	0.15	0.14							24.04		
2020	9	1	23	44075	441	0.1	0.14	0.17	0.21	0.15	0.14							23.67		
2020	9	2	23	44076	442	0.09	0.13	0.17	0.21	0.15	0.14							23.35		
2020	9	3	23	44077	443	0.09	0.13	0.17	0.2	0.15	0.14							23.19		
2020	9	4	23	44078	444	0.09	0.13	0.17	0.2	0.15	0.14							23.04		
2020	9	5	23	44079	445	0.09	0.12	0.17	0.2	0.15	0.14							22.95		
2020	9	6	23	44080	446	0.09	0.12	0.17	0.2	0.15	0.13							22.85		
2020	9	7	23	44081	447	0.09	0.12	0.16	0.2	0.15	0.13							22.8		

2020	9	8	23	44082	448	0.09	0.12	0.16	0.2	0.15	0.13							22.77		
2020	9	9	23	44083	449	0.09	0.12	0.16	0.2	0.15	0.13							22.65		
2020	9	10	23	44084	450	0.09	0.12	0.16	0.2	0.15	0.13							22.54		
2020	9	11	23	44085	451	0.09	0.12	0.16	0.2	0.15	0.13							22.42		
2020	9	12	23	44086	452	0.09	0.11	0.16	0.2	0.15	0.13							22.36		
2020	9	13	17	44087	453	0.09	0.11	0.16	0.2	0.15	0.13							22.38		

year	month	day	matric potential (kPa)											
			5.cm.kPa.x	5.cm.kPa.y	20.cm.kPa.x	20.cm.kPa.y	40.cm.kPa.x	40.cm.kPa.y	60.cm.kPa.x	60.cm.kPa.y	grad 20-40 x	grad 40-60 x	grad 20-40 y	grad 40-60 y
2019	6	18	-62.61	-63.69	-68.72	-52.03	-57.79	-73.23	-54.28	-61.04	3.26	-8.47	3.88	2.63
2019	6	19	-52.58	-60.51	-66.7	-56.94	-58.57	-72.14	-52.83	-63.17	3.72	-8.65	1.82	3.3
2019	6	20	-20.75	-16.07	-58.84	-36.34	-56.91	-69.28	-50.57	-63.25	6.22	-8.35	11.29	4.17
2019	6	21	-20.26	-16.81	-43.51	-26.31	-52.13	-64.26	-46.6	-59.82	11.38	-7.83	13.91	4.84
2019	6	22	-23.35	-25.22	-44.78	-28.1	-49.22	-61.8	-43.87	-55.95	9.51	-7.97	11.56	4.37
2019	6	23	-25.35	-35.85	-47.35	-30.12	-48.81	-61.4	-43.17	-55.03	8.02	-8.11	10.35	4.11
2019	6	24	-24.34	-27.64	-48.18	-30.35	-49.16	-61.25	-43.07	-54.85	7.54	-8.09	10.4	3.85
2019	6	25	-23.1	-22.26	-47.98	-28.72	-48.91	-60.83	-42.78	-54.56	7.43	-8.02	11.09	3.82
2019	6	26	-24.07	-30.07	-48.98	-29.96	-48.7	-60.63	-42.68	-54.39	6.82	-7.97	10.37	3.84
2019	6	27	-24.94	-35.11	-49.89	-31.13	-48.83	-60.62	-42.71	-54.34	6.37	-7.96	9.85	3.76
2019	6	28	-19.36	-19.29	-47	-28.42	-48.88	-58.12	-41.88	-54.28	6.56	-7.12	11.23	3.7
2019	6	29	-19.04	-15.43	-40.9	-24.92	-46.83	-48.5	-37.41	-52.43	4.8	-4.54	11.96	3.8
2019	6	30	-20.95	-18.88	-41.24	-25.95	-43.4	-48.16	-36.51	-48.61	4.46	-4.83	9.72	3.6
2019	7	1	-21.17	-21.18	-42.41	-26.78	-43.07	-48.36	-36.36	-47.82	3.97	-5	9.15	3.37
2019	7	2	-21.07	-19.25	-41.24	-25.99	-42.49	-48.14	-36.23	-47.51	4.45	-4.96	9.25	3.51
2019	7	3	-22.77	-29.57	-42.51	-27.81	-42.37	-48.27	-36.22	-47.49	3.88	-5.03	8.28	3.56
2019	7	4	-24.12	-38.14	-43.83	-29.59	-42.67	-48.96	-36.48	-47.7	3.57	-5.24	7.54	3.51
2019	7	5	-26.24	-45.86	-45.18	-31.55	-43.25	-49.76	-36.98	-47.94	3.29	-5.39	6.85	3.34
2019	7	6	-28.88	-55.78	-46.35	-33.45	-43.73	-50.58	-37.57	-48.16	3.12	-5.51	6.14	3.21
2019	7	7	-30.93	-58.89	-48.03	-36	-44.25	-51.51	-38.22	-48.5	2.74	-5.64	5.13	3.13
2019	7	8	-28.76	-37.39	-49	-38.72	-44.81	-52.35	-38.86	-48.88	2.67	-5.74	4.05	3.04
2019	7	9	-30.32	-48.38	-49.59	-42.77	-45.39	-53.13	-39.51	-49.42	2.77	-5.81	2.31	3.01
2019	7	10	-32.25	-64.53	-49.72	-45.73	-45.73	-53.81	-40.13	-49.84	3.05	-5.84	1	3.06
2019	7	11	-37.43	-86.07	-50.95	-50.02	-46.1	-54.63	-40.71	-50.27	2.84	-5.96	-0.96	3.08
2019	7	12	-52.63	-125.28	-53.54	-58.76	-47.2	-56.07	-41.74	-51.14	2.26	-6.16	-4.78	2.97
2019	7	13	-94.13	-236.58	-56.26	-78	-48.56	-57.66	-42.95	-52.29	1.7	-6.36	-13.72	2.86
2019	7	14	-171.35	-526.92	-58.14	-113.76	-49.71	-58.96	-43.97	-53.13	1.41	-6.49	-31.03	2.71
2019	7	15	-270.28	-1039.95	-59.39	-165.4	-50.66	-60.22	-44.98	-53.98	1.42	-6.62	-56.37	2.66

2019	7	16	-340.62	-1574.89	-60.28	-227.62	-51.34	-61.33	-45.86	-54.73	1.53	-6.73	-87.14	2.7
2019	7	17	-426.1	-1935.48	-61.86	-302.44	-52.07	-62.43	-46.92	-55.55	1.28	-6.75	-124.19	2.74
2019	7	18	-55.5	-22.04	-61.84	-379.39	-52.35	-63.15	-47.63	-56.05	1.65	-6.76	-162.52	2.85
2019	7	19	-17.58	-14.72	-54.97	-104.72	-51.76	-61.47	-46.71	-55.93	4.25	-6.38	-25.48	3.09
2019	7	20	-18.2	-15.82	-29.8	-20.09	-43.35	-53.75	-39.47	-50.32	12.97	-6.14	12.63	4.49
2019	7	21	-22.24	-24.96	-35.37	-25.47	-42.8	-52.99	-37.63	-47.94	9.81	-6.68	9.66	3.57
2019	7	22	-25.55	-39.91	-39.89	-29.71	-44.1	-53.85	-38.32	-48.48	7.98	-6.76	8.2	3.19
2019	7	23	-33.93	-55.99	-44.03	-34.82	-45.49	-55.17	-39.57	-49.4	6.57	-6.8	6.33	2.96
2019	7	24	-43.61	-71.61	-46.74	-39.67	-46.54	-56.3	-40.75	-50.23	5.78	-6.78	4.43	2.85
2019	7	25	-35.67	-44.85	-46.37	-42.61	-46.99	-57.15	-41.56	-50.82	6.39	-6.8	3.19	2.91
2019	7	26	-48.84	-53.63	-49.25	-52.99	-47.63	-58.21	-42.71	-51.76	5.48	-6.75	-1.68	3.06
2019	7	27	-72.27	-63.37	-52.76	-69.63	-48.75	-59.55	-43.93	-52.79	4.39	-6.81	-9.44	3.02
2019	7	28	-18.02	-15	-41.21	-20.76	-47.63	-57.75	-42.63	-52.33	9.27	-6.56	14.43	3.35
2019	7	29	-17.56	-15.21	-31.21	-19.07	-40.75	-50.96	-35.07	-48.31	10.87	-6.94	11.84	4.78
2019	7	30	-19.99	-17.06	-29.19	-21.71	-33.52	-48.5	-31.72	-39.42	10.65	-7.39	6.91	3.95
2019	7	31	-22.07	-23.87	-31.74	-24.69	-34.4	-49.04	-32.05	-39.21	9.65	-7.49	5.86	3.4
2019	8	1	-19.94	-18.46	-32.77	-24.19	-35.5	-49.4	-32.35	-39.61	9.32	-7.52	6.66	3.06
2019	8	2	-22.26	-25.62	-33.83	-25.94	-36.33	-49.67	-32.64	-40.01	8.92	-7.52	6.2	2.84
2019	8	3	-23.01	-29.09	-35.36	-28.55	-37.43	-50.26	-33.25	-40.61	8.45	-7.5	5.44	2.59
2019	8	4	-25.3	-36.52	-36.41	-30.77	-38.23	-51.07	-34.04	-41.36	8.33	-7.51	4.73	2.57
2019	8	5	-34.03	-46.48	-38.94	-35.03	-39.24	-52.07	-35.01	-42.23	7.57	-7.53	3.1	2.49
2019	8	6	-35.3	-38.13	-40.74	-39.71	-40.31	-53.1	-35.97	-43.09	7.18	-7.56	1.3	2.39
2019	8	7	-34.46	-47.1	-41.63	-45.47	-41.11	-53.88	-36.9	-43.79	7.13	-7.49	-1.18	2.34
2019	8	8	-49.82	-67.66	-44.2	-56.29	-42.1	-54.91	-37.9	-44.71	6.36	-7.51	-6.09	2.3
2019	8	9	-70.72	-77.32	-45.87	-67.31	-43.14	-55.96	-38.89	-45.55	6.05	-7.54	-11.09	2.2
2019	8	10	-76.88	-83	-46.19	-79.91	-43.77	-56.51	-39.73	-46.15	6.16	-7.39	-17.07	2.19
2019	8	11	-98.23	-108.74	-47.62	-101.36	-44.5	-57.38	-40.66	-46.9	5.88	-7.36	-27.43	2.2
2019	8	12	-115.1	-135.02	-48.38	-116.51	-44.93	-57.96	-41.31	-47.32	5.79	-7.32	-34.79	2.2
2019	8	13	-146.55	-147.37	-49.99	-140.56	-45.72	-58.69	-42.01	-47.85	5.35	-7.34	-46.42	2.06
2019	8	14	-234.9	-152.9	-52.73	-203.46	-47.32	-59.89	-43.14	-48.88	4.58	-7.38	-77.07	1.78

2019	8	15	-394.54	-230.54	-56.84	-289.32	-49.41	-61.58	-44.71	-50.41	3.37	-7.43	-118.95	1.5
2019	8	16	-490.43	-341.26	-58.55	-334.74	-50.43	-62.8	-45.95	-51.59	3.12	-7.42	-141.16	1.58
2019	8	17	-523.01	-432.95	-58.48	-376.31	-51.06	-63.57	-46.92	-52.25	3.55	-7.32	-161.63	1.59
2019	8	18	-545.77	-589.7	-59.48	-397.15	-51.58	-64.2	-47.63	-52.79	3.36	-7.28	-171.78	1.61
2019	8	19	-543.88	-658.49	-59.39	-399.66	-51.59	-64.46	-48.07	-52.92	3.53	-7.19	-173.03	1.66
2019	8	20	-575.67	-671.2	-61.29	-438.67	-52.73	-65.23	-48.81	-53.41	2.97	-7.21	-191.97	1.34
2019	8	21	-670.98	-902.56	-66.95	-514.56	-55.33	-67.27	-50.32	-54.79	1.16	-7.47	-228.62	0.73
2019	8	22	-765.63	-1304.97	-71.8	-560.21	-57.37	-69.3	-51.85	-56.2	-0.25	-7.72	-250.42	0.41
2019	8	23	-847.78	-1830.95	-74.41	-628.3	-58.37	-70.83	-53.3	-57.27	-0.79	-7.77	-283.96	0.45
2019	8	24	-830.26	-1841.16	-74.94	-626.84	-58.76	-71.59	-54.19	-57.89	-0.68	-7.7	-283.04	0.56
2019	8	25	-870.29	-1499.76	-76.57	-667.31	-60.03	-72.61	-55.08	-58.64	-0.98	-7.76	-302.64	0.3
2019	8	26	-920.63	-1723.68	-81.45	-723.24	-61.51	-74.54	-56.57	-59.63	-2.45	-7.99	-329.86	0.06
2019	8	27	-946.22	-1841.37	-86.9	-769.8	-62.69	-76.45	-58.06	-60.51	-4.23	-8.19	-352.55	-0.09
2019	8	28	-986.26	-2346.35	-95.85	-781.93	-64.32	-79.16	-59.62	-61.45	-7.35	-8.77	-357.8	-0.44
2019	8	29	-1054.38	-2869.97	-107.06	-841.85	-65.44	-82.57	-61.37	-62.45	-11.25	-9.6	-387.21	-0.49
2019	8	30	-1097.15	-3627.84	-112.7	-858.34	-65.33	-84.19	-62.51	-62.8	-13.26	-9.84	-395.51	-0.26
2019	8	31	-1080.71	-3361.57	-106.08	-865.45	-64.58	-82.91	-62.07	-62.4	-10.58	-9.42	-399.43	-0.09
2019	9	1	-1022.09	-3014.73	-103.72	-836.69	-64.47	-82.63	-62	-62.29	-9.55	-9.32	-385.11	-0.09
2019	9	2	-971.5	-2487.75	-106.22	-803.19	-65.16	-83.42	-62.38	-62.54	-10.4	-9.52	-368.02	-0.31
2019	9	3	-973.5	-1696.16	-113.51	-836.61	-66.43	-86.11	-63.52	-63.45	-12.7	-10.3	-384.09	-0.49
2019	9	4	-944.72	-1289.53	-130.38	-824.85	-68.07	-92.09	-65.68	-64.76	-18.15	-12.21	-377.39	-0.66
2019	9	5	-96.81	-743.45	-141.3	-835.02	-68.64	-94.41	-66.8	-65.51	-22.45	-12.8	-382.19	-0.57
2019	9	6	-83.67	-221.48	-137.29	-837.94	-68.54	-94.24	-66.91	-65.66	-20.52	-12.67	-383.7	-0.44
2019	9	7	-180.68	-196.37	-139.3	-810.61	-68.72	-95.83	-67.51	-65.93	-20.74	-13.16	-369.95	-0.4
2019	9	8	-369.25	-200.47	-144.06	-807.96	-68.38	-97.32	-68.59	-66.22	-22.37	-13.37	-368.79	-0.08
2019	9	9	-373.96	-138.17	-134.68	-837.44	-67.7	-95.74	-68.17	-65.71	-18.47	-12.79	-383.87	0.01
2019	9	10	-356.36	-58.84	-127.04	-829.39	-67	-94.67	-67.58	-65.44	-15.19	-12.55	-380.19	0.22
2019	9	11	-329.33	-33.38	-122.11	-808.34	-66.77	-93.77	-67.2	-65.26	-13.17	-12.29	-369.79	0.24
2019	9	12	-337.35	-36.86	-122.59	-805.23	-67.08	-94.56	-67.39	-65.32	-13.02	-12.58	-368.08	0.12
2019	9	13	-482.5	-44.11	-132.18	-776.76	-67.64	-97.88	-68.51	-65.85	-16.15	-13.69	-353.56	0.11

2019	9	14	-644.66	-52.45	-144.79	-778.27	-68.08	-101.92	-70.02	-66.42	-20.43	-14.95	-354.09	0.17
2019	9	15	-754.07	-67.29	-164.16	-780.39	-69.17	-107.07	-72.1	-67.44	-27.55	-16.48	-354.61	0.13
2019	9	16	-895.47	-91.05	-193.73	-764.52	-70.1	-112.49	-74.46	-68.52	-39.62	-18.01	-346.21	0.21
2019	9	17	-964.64	-109.74	-215.89	-769.12	-70.24	-114.73	-75.99	-69.08	-49.58	-18.37	-348.44	0.42
2019	9	18	-1003.14	-117.03	-233.25	-821.97	-70.66	-116.68	-77.13	-69.59	-57.28	-18.78	-374.65	0.46
2019	9	19	-1030.69	-135.36	-256.69	-836.16	-71.81	-121.11	-79.36	-70.65	-66.79	-19.87	-381.17	0.42
2019	9	20	-1092.7	-166.74	-289.02	-825.8	-73.45	-126.73	-82.89	-72.03	-80.15	-20.92	-375.18	0.29
2019	9	21	-1196.91	-215.7	-328.2	-872.82	-74.59	-131.6	-86.5	-73.2	-97.3	-21.55	-398.11	0.31
2019	9	22	-1235.55	-314.69	-358.54	-874.52	-76.33	-136.4	-89.74	-74.49	-110.07	-22.33	-398.09	0.08
2019	9	23	-1363.9	-467.17	-401.47	-881.32	-77.83	-141.45	-93.42	-75.81	-129.01	-23.01	-400.74	-0.01
2019	9	24	-1457.15	-662.17	-442.42	-911.19	-77.64	-144.39	-95.82	-76.19	-148.01	-23.28	-415.78	0.28
2019	9	25	-1465.19	-896.14	-468.14	-936.44	-77.53	-146.71	-97.12	-76.66	-159.71	-23.79	-428.46	0.57
2019	9	26	-1476.18	-656.05	-483.21	-921.16	-76.4	-144.23	-96.81	-75.74	-168.49	-22.71	-421.38	0.67
2019	9	27	-130.55	-14.83	-496.62	-978.21	-75.05	-140.27	-94.45	-74.96	-177.17	-21.91	-450.58	0.95
2019	9	28	-26.52	-16.63	-495	-1012.17	-74.13	-138.89	-92.9	-74.36	-177.05	-22	-468.02	1.12
2019	9	29	-23.9	-17.87	-474.41	-916.32	-73.19	-137.03	-91.35	-74	-167.69	-21.84	-420.57	1.4
2019	9	30	-24.01	-20.49	-445.66	-685.63	-72.55	-135.6	-90.47	-73.42	-154.03	-21.57	-305.54	1.43
2019	10	1	-24.24	-22.85	-422.67	-478.37	-71.87	-134.61	-89.12	-72.9	-143.03	-21.75	-202.25	1.51
2019	10	2	-25.3	-26.14	-391.38	-314.43	-71.55	-133.04	-88.15	-72.66	-128.17	-21.45	-120.44	1.56
2019	10	3	-25.9	-28.03	-366.6	-208.16	-71.11	-131.49	-87.14	-72.29	-116.56	-21.18	-67.53	1.59
2019	10	4	-26.98	-30.1	-345.68	-156.31	-70.55	-130.61	-86.19	-71.84	-106.54	-21.21	-41.88	1.64
2019	10	5	-28.46	-30.58	-325.53	-122.33	-70.4	-129.68	-85.72	-71.64	-96.93	-20.98	-24.97	1.62
2019	10	6	-29.33	-31.17	-312.59	-103.76	-70.36	-128.23	-85.1	-71.59	-91.18	-20.56	-15.7	1.62
2019	10	7	-30.51	-32.95	-296.15	-92.07	-70.26	-126.97	-84.33	-71.54	-83.59	-20.32	-9.91	1.64
2019	10	8	-26.22	-19.46	-286.78	-82.86	-69.95	-126.1	-83.71	-71.43	-79.34	-20.19	-5.46	1.74
2019	10	9	-22.92	-20.53	-275.16	-76.01	-69.32	-125.73	-83.33	-71.21	-73.71	-20.2	-2.35	1.95
2019	10	10	-22.75	-32.97	-262.35	-69.47	-68.87	-125.24	-82.57	-70.75	-67.56	-20.33	0.7	1.94
2019	10	11	-23.07	-53.02	-247.6	-63.47	-68.18	-124.63	-81.67	-70.41	-60.48	-20.48	3.35	2.11
2019	10	12	-23.56	-27.81	-232.19	-58.92	-67.82	-124	-81.11	-70.19	-53.09	-20.44	5.45	2.18
2019	10	13	-24.66	-25.47	-214.8	-55.68	-67.47	-123.17	-80.3	-69.95	-44.82	-20.43	6.9	2.24

2019	10	14	-20.24	-13.2	-201.89	-37.74	-67.28	-122.38	-79.68	-69.6	-38.76	-20.35	15.77	2.16
2019	10	15	-18.63	-13.35	-192.59	-19.49	-66.89	-121.82	-79.41	-69.37	-34.38	-20.21	24.7	2.24
2019	10	16	-18.95	-13.62	-182.63	-19.6	-66.2	-121.13	-79.14	-69.1	-29.75	-19.99	24.3	2.45
2019	10	17	-19.5	-14.43	-172.02	-20.29	-65.66	-120.02	-78.63	-68.74	-25	-19.7	23.69	2.54
2019	10	18	-19.67	-15.43	-163.11	-20.71	-65.18	-118.81	-78.13	-68.16	-21.15	-19.34	23.24	2.49
2019	10	19	-19.71	-16.8	-154.5	-21.09	-64.66	-117.96	-77.82	-67.79	-17.27	-19.07	22.79	2.57
2019	10	20	-19.88	-17.68	-145.29	-21.6	-64.32	-117.06	-77.42	-67.34	-13.12	-18.82	22.36	2.51
2019	10	21	-19.8	-19.4	-138.65	-21.89	-63.88	-116.22	-76.81	-66.88	-10.22	-18.7	22	2.5
2019	10	22	-19.84	-20.13	-131.8	-22.23	-63.54	-115.36	-76.32	-66.63	-7.22	-18.52	21.66	2.55
2019	10	23	-19.1	-15.11	-125.59	-21.95	-63.4	-114.63	-75.83	-66.33	-4.48	-18.4	21.73	2.46
2019	10	24	-19.32	-16.65	-120.54	-21.68	-63.15	-114.03	-75.25	-65.97	-2.25	-18.39	21.74	2.41
2019	10	25	-19.52	-17.05	-115.59	-22.08	-63.11	-113.12	-74.87	-65.71	-0.23	-18.13	21.51	2.3
2019	10	26	-19.06	-16.69	-112.54	-21.7	-62.81	-112.36	-74.65	-65.57	0.91	-17.86	21.56	2.38
2019	10	27	-19.26	-140.37	-109.22	-21.76	-62.41	-111.56	-74.14	-65.36	2.17	-17.71	21.33	2.47
2019	10	28	-19.46	-230.53	-106.35	-22.15	-61.94	-110.98	-73.55	-64.88	3.32	-17.72	20.89	2.47
2019	10	29	-23.56	-491.26	-104.12	-22.74	-61.61	-110.47	-73.23	-64.59	4.17	-17.62	20.43	2.49
2019	10	30	-407.07	-467.12	-102.32	-24.13	-61.42	-110.06	-72.82	-64.42	4.87	-17.62	19.64	2.5
2019	10	31	-57.79	-234.09	-101.36	-24.72	-61.2	-109.45	-72.33	-64.18	5.04	-17.56	19.24	2.49
2019	11	1	-19.06	-310.57	-100.2	-24.65	-61	-108.8	-72.1	-63.86	5.3	-17.35	19.18	2.43
2019	11	2	-19.27	-112.58	-99.56	-24.92	-60.87	-108.21	-71.91	-63.64	5.33	-17.15	18.97	2.39
2019	11	3	-18.59	-17.01	-99.15	-24.76	-60.78	-107.75	-71.62	-63.52	5.3	-17.06	19.01	2.37
2019	11	4	-18.75	-42.62	-98.74	-24.14	-60.72	-107.37	-71.26	-63.43	5.31	-17.05	19.29	2.35
2019	11	5	-19.29	-62.46	-98.1	-24.17	-60.66	-106.9	-70.92	-63.35	5.4	-16.99	19.25	2.34
2019	11	6	-27.89	-654.77	-97.6	-24.37	-60.63	-106.48	-70.7	-63.29	5.44	-16.89	19.13	2.33
2019	11	7	-641.45	-767.59	-97.24	-35.01	-60.57	-106.11	-70.53	-63.18	5.44	-16.79	13.78	2.3
2019	11	8	-336.2	-338.78	-97.05	-40.01	-60.52	-105.39	-70.22	-62.98	5.17	-16.59	11.26	2.23
2019	11	9	-33.02	-33.25	-96.85	-26.3	-60.48	-105.03	-69.89	-62.8	5.09	-16.57	18.09	2.16
2019	11	10	-17.63	-37.37	-96.77	-26.27	-60.46	-104.6	-69.63	-62.67	4.92	-16.48	18.1	2.11
2019	11	11	-18.17	-228.51	-96.62	-26.37	-60.45	-104.23	-69.47	-62.59	4.8	-16.38	18.04	2.07
2019	11	12	-19.15	-224.84	-96.29	-27.15	-60.44	-103.79	-69.34	-62.54	4.75	-16.23	17.64	2.05

2019	11	13	-19.72	-173.71	-95.77	-28.17	-60.42	-103.32	-69.13	-62.49	4.77	-16.09	17.12	2.04
2019	11	14	-19.5	-148.53	-95.26	-28.45	-60.39	-102.9	-68.87	-62.44	4.82	-16.01	16.97	2.03
2019	11	15	-19.29	-132.3	-94.84	-28.43	-60.37	-102.45	-68.63	-62.41	4.8	-15.91	16.97	2.02
2019	11	16	-18.7	-94.47	-94.47	-28.36	-60.35	-102.04	-68.46	-62.39	4.79	-15.79	17	2.02
2019	11	17	-18.18	-67.13	-94.34	-28.17	-60.34	-101.7	-68.33	-62.36	4.68	-15.68	17.09	2.01
2019	11	18	-17.45	-39.71	-94.11	-26.63	-60.34	-101.33	-68.21	-62.33	4.61	-15.56	17.85	2
2019	11	19	-17.36	-30.84	-93.55	-21.39	-60.31	-101.07	-68.12	-62.31	4.76	-15.48	20.46	2
2019	11	20	-17.58	-25.34	-92.7	-21.09	-60.23	-100.71	-67.93	-62.27	5	-15.39	20.57	2.02
2019	11	21	-18.04	-160.05	-92.02	-21.59	-60.09	-100.23	-67.6	-62.19	5.11	-15.32	20.25	2.05
2019	11	22	-18.49	-211.12	-90.74	-22.57	-59.96	-99.57	-67.28	-62.06	5.42	-15.14	19.69	2.05
2019	11	23	-18.83	-153.69	-89.77	-23.49	-59.85	-98.82	-67.08	-61.91	5.52	-14.87	19.18	2.03
2019	11	24	-18.61	-116.92	-88.77	-23.94	-59.78	-98.23	-66.9	-61.79	5.73	-14.67	18.92	2
2019	11	25	-18.18	-198.72	-88.04	-23.98	-59.75	-97.84	-66.66	-61.69	5.9	-14.59	18.89	1.97
2019	11	26	-18.82	-274.17	-87.72	-24.61	-59.72	-97.36	-66.33	-61.63	5.82	-14.52	18.56	1.96
2019	11	27	-449.24	-298.93	-87.28	-539.11	-59.68	-96.91	-66.07	-61.58	5.82	-14.42	-238.72	1.95
2019	11	28	-856.65	-304.9	-86.89	-1252.09	-59.84	-96.58	-65.93	-61.56	5.84	-14.32	-595.13	1.86
2019	11	29	-905.21	-303.86	-93.21	-1333.55	-60.2	-96.47	-65.84	-61.67	2.63	-14.31	-635.68	1.74
2019	11	30	-948.49	-313.54	-175.17	-1392.5	-60.54	-96.94	-65.89	-62.05	-38.12	-14.52	-664.98	1.75
2019	12	1	-1045.77	-342.45	-903.15	-1555.29	-61.19	-97.69	-66.09	-62.46	-401.73	-14.8	-746.05	1.64
2019	12	2	-1031.61	-326.01	-1490.12	-1552.37	-62.24	-98.83	-66.71	-63.29	-694.64	-15.06	-744.06	1.53
2019	12	3	-965.87	-299.11	-1504.1	-1426.25	-63.34	-100.77	-67.41	-64.28	-700.66	-15.68	-680.45	1.47
2019	12	4	-931.54	-288.64	-1466.77	-1368.21	-63.76	-101.93	-68.12	-64.89	-681.42	-15.91	-651.22	1.56
2019	12	5	-941.72	-293.18	-1430.58	-1357.37	-63.83	-102.38	-68.37	-65.37	-663.1	-16.01	-645.77	1.77
2019	12	6	-1000.18	-309.92	-1590.77	-1442.37	-63.99	-102.86	-68.59	-65.51	-742.96	-16.13	-688.19	1.76
2019	12	7	-991.01	-304.71	-1701.97	-1438.55	-64.55	-104.43	-69.22	-65.74	-797.77	-16.61	-686	1.6
2019	12	8	-1003.91	-310.28	-1726.11	-1453.81	-65.05	-106.13	-69.84	-66.33	-808.99	-17.15	-693.38	1.64
2019	12	9	-1009.3	-312.87	-1762.41	-1477.63	-65.75	-107.67	-70.65	-66.69	-826.37	-17.51	-704.94	1.47
2019	12	10	-1011.41	-312.08	-1782.58	-1485.31	-66.42	-109.52	-71.52	-67.04	-835.53	-18	-708.44	1.31
2019	12	11	-1016.04	-314.96	-1791.97	-1498.46	-76.78	-111.13	-72.18	-67.56	-839.42	-18.47	-709.84	-3.61
2019	12	12	-993.99	-303.72	-1778.47	-1441.12	-195.71	-112.59	-72.96	-67.83	-831.94	-18.82	-621.71	-62.94

2019	12	13	-997.44	-303.85	-1771.16	-1429.47	-321.98	-113.37	-73.47	-68.09	-827.89	-18.95	-552.74	-125.95
2019	12	14	-997.22	-303.07	-1772.87	-1428.98	-396.26	-114.05	-73.91	-68.43	-828.41	-19.07	-515.36	-162.92
2019	12	15	-979.63	-300.26	-1758.89	-1411.25	-418.92	-114.69	-74.54	-68.74	-821.1	-19.07	-495.16	-174.09
2019	12	16	-961.2	-297.78	-1737.22	-1399.25	-416.53	-114.79	-74.81	-68.87	-810.22	-18.99	-490.36	-172.83
2019	12	17	-952.05	-292.04	-1718.39	-1385.01	-409.03	-114.53	-74.85	-68.9	-800.93	-18.84	-486.99	-169.07
2019	12	18	-948.68	-292.17	-1694.75	-1377.14	-397.72	-114.18	-74.79	-68.85	-789.28	-18.7	-488.71	-163.43
2019	12	19	-955.72	-294.75	-1712.44	-1385.27	-402.16	-113.9	-74.72	-68.78	-798.27	-18.59	-490.56	-165.69
2019	12	20	-963.89	-296.29	-1719.54	-1387.41	-409.01	-113.92	-74.72	-68.78	-801.81	-18.6	-488.2	-169.12
2019	12	21	-975.93	-297.47	-1743.08	-1396.96	-442.93	-114.08	-74.8	-68.84	-813.5	-18.64	-476.01	-186.05
2019	12	22	-951.52	-290.69	-1710.83	-1372.19	-444.6	-114.34	-75.02	-68.93	-797.24	-18.66	-462.79	-186.84
2019	12	23	-965.87	-294.48	-1731.77	-1385.31	-451.66	-114.24	-75.11	-68.95	-807.76	-18.57	-465.83	-190.35
2019	12	24	-981.13	-299.95	-1739.74	-1396.72	-468.57	-114.41	-75.32	-68.98	-811.66	-18.55	-463.08	-198.79
2019	12	25	-966.33	-295.26	-1738.94	-1386.52	-498.93	-114.95	-75.66	-69.06	-810.99	-18.64	-442.8	-213.93
2019	12	26	-1006.84	-308.7	-1768.07	-1429.23	-529.45	-115.46	-75.97	-69.17	-825.3	-18.74	-448.89	-229.14
2019	12	27	-1025.79	-314.92	-1815.63	-1476.34	-623.17	-117.45	-76.38	-69.49	-848.09	-19.53	-425.58	-275.84
2019	12	28	-1023.2	-315.04	-1824.16	-1476.94	-689.59	-120.2	-77.34	-70.12	-850.98	-20.43	-392.68	-308.73
2019	12	29	-1011.67	-306.64	-1818.64	-1448.85	-729.06	-122.41	-78.1	-70.46	-847.12	-21.15	-358.89	-328.3
2019	12	30	-1021.01	-313.15	-1824.47	-1468.97	-755.88	-123.86	-78.85	-70.98	-849.31	-21.5	-355.54	-341.45
2019	12	31	-993.75	-300.11	-1813.95	-1429.6	-792.53	-126.01	-79.31	-71.42	-842.97	-22.35	-317.53	-359.56
2020	1	1	-969.35	-297.65	-1774.74	-1396.06	-764.85	-128.2	-79.47	-71.62	-822.27	-23.37	-314.61	-345.61
2020	1	2	-970.89	-297.37	-1779.13	-1400.76	-770.4	-130.48	-79.35	-71.57	-823.33	-24.56	-314.18	-348.41
2020	1	3	-962.66	-296.69	-1767.47	-1392.44	-763.91	-133.08	-79.28	-71.53	-816.19	-25.9	-313.27	-345.19
2020	1	4	-958.5	-293.63	-1766.72	-1387.52	-764.78	-135.89	-79.15	-71.48	-814.41	-27.37	-310.37	-345.65
2020	1	5	-979.46	-302.31	-1775.1	-1407.15	-770.52	-140.83	-79.04	-71.43	-816.13	-29.89	-317.31	-348.55
2020	1	6	-989.18	-305.47	-1788.77	-1421.45	-823.82	-153.99	-79.06	-71.46	-816.39	-36.46	-297.81	-375.18
2020	1	7	-1026.67	-320.58	-1849.09	-1496.03	-909.22	-206.4	-79.27	-71.69	-820.34	-62.57	-292.4	-417.77
2020	1	8	-1021.81	-315.93	-1879.63	-1489.7	-1003.11	-350.09	-79.89	-72.73	-763.77	-134.1	-242.29	-464.19
2020	1	9	-1017.02	-310.77	-1861.8	-1456.88	-1017.9	-476.03	-81.04	-73.96	-691.89	-196.49	-218.49	-470.97
2020	1	10	-1026.3	-317.99	-1883.25	-1479.85	-1035.91	-593.06	-81.65	-74.75	-644.09	-254.71	-220.97	-479.58
2020	1	11	-1025.59	-314.31	-1903.26	-1469.98	-1062.27	-752.72	-82.52	-75.54	-574.27	-334.1	-202.86	-492.36

2020	1	12	-1024.23	-317.07	-1893.55	-1471.51	-1075.21	-896.64	-83.33	-76.22	-497.45	-405.66	-197.15	-498.5
2020	1	13	-1031.05	-321.71	-1917.37	-1497.63	-1142.49	-1056.28	-83.72	-76.79	-429.55	-485.28	-176.57	-531.85
2020	1	14	-1054.47	-336.92	-1981.24	-1561.84	-1191.82	-1276.58	-84.34	-77.25	-351.33	-595.12	-184.01	-556.28
2020	1	15	-1096.51	-355.88	-2101.28	-1666.94	-1297.48	-1639.33	-85.41	-78.45	-229.98	-775.96	-183.73	-608.52
2020	1	16	-1113.25	-350.4	-2151.04	-1671.3	-1362.65	-2100.51	-86.71	-80.8	-24.27	-1005.9	-153.33	-639.92
2020	1	17	-1084	-332.53	-2133.93	-1586.2	-1381.26	-2360.72	-88.5	-84.05	114.39	-1135.11	-101.47	-647.6
2020	1	18	-1067.84	-330.56	-2112.49	-1568.7	-1371.39	-2433.77	-89.82	-86.41	161.64	-1170.97	-97.66	-641.49
2020	1	19	-1066.69	-328.72	-2113.33	-1568.92	-1376.55	-2535.87	-90.52	-87.22	212.27	-1221.67	-95.19	-643.66
2020	1	20	-1049.95	-322.04	-2085.77	-1541.19	-1370.46	-2599.01	-90.87	-88.1	257.62	-1253.07	-84.36	-640.18
2020	1	21	-1030.45	-317	-2014.31	-1504.11	-1353.12	-2558.83	-91.01	-99.29	273.26	-1232.91	-74.49	-625.91
2020	1	22	-1013.33	-307.55	-1944.15	-1468.07	-1339.1	-2485.79	-90.91	-137.42	271.82	-1196.44	-63.49	-599.84
2020	1	23	-985.48	-301.3	-1862.43	-1420.35	-1321.54	-2356.66	-90.63	-208.73	248.11	-1132.01	-48.4	-555.41
2020	1	24	-976.75	-298.68	-1832.77	-1405.16	-1304.03	-2263.83	-89.95	-246.18	216.53	-1085.94	-49.56	-527.92
2020	1	25	-966.02	-294.82	-1819.27	-1391.47	-1285.6	-2216.6	-89.14	-250.95	199.66	-1062.73	-51.94	-516.32
2020	1	26		-295.08		-1388.5	-1267.07			-244.56			-59.72	-510.26
2020	1	27		-291.7		-1381.71	-1255.69			-236.5			-62.01	-508.59
2020	1	28		-288.5		-1365.05	-1228.98			-228.86			-67.03	-499.06
2020	1	29		-293.37		-1375.81	-1210.15			-219.86			-81.83	-494.15
2020	1	30		-289.95		-1371.25	-1216.9			-214.73			-76.18	-500.09
2020	1	31		-288.37		-1361.27	-1205.12			-211.19			-77.08	-495.97
2020	2	1		-280.99		-1322.92	-1187.39			-205.55			-66.76	-489.92
2020	2	2		-274.94		-1249.56	-1146			-196.24			-50.78	-473.88
2020	2	3		-287.88		-1318.55	-1122.9			-182.2			-96.82	-469.35
2020	2	4		-301.09		-1388.72	-1163.68			-173.91			-111.52	-493.89
2020	2	5		-295.19		-1385.36	-1205.05			-183.75			-89.15	-509.65
2020	2	6		-286.97		-1353.09	-1198.19			-198.95			-76.45	-498.62
2020	2	7		-282.18		-1312.47	-1172.07			-198.76			-69.2	-485.66
2020	2	8		-283.68		-1304.61	-1149.23			-190.23			-76.69	-478.5
2020	2	9		-286.71		-1328.14	-1145.74			-181.44			-90.2	-481.15
2020	2	10		-284.59		-1316.98	-1150.42			-178.17			-82.28	-485.12

2020	2	11		-281.4		-1294.72	-1139.36			-175.71			-76.68	-480.82
2020	2	12		-279.54		-1274.44	-1115.77			-172.97			-78.33	-470.4
2020	2	13		-284.49		-1297.46	-1105.67			-167.38			-94.89	-468.15
2020	2	14		-283.7		-1299.12	-1118.21			-163.87			-89.46	-476.17
2020	2	15		-284.35		-1299.76	-1119.17			-162.82			-89.3	-477.17
2020	2	16		-284.65		-1305.78	-1127.98			-162.74			-87.9	-481.62
2020	2	17		-284.45		-1303.46	-1128.96			-164.05			-86.25	-481.45
2020	2	18		-290.51		-1344.17	-1138.08			-164.99			-102.04	-485.55
2020	2	19		-294.7		-1368.44	-1164.26			-167.98			-101.09	-497.14
2020	2	20		-292.8		-1367.73	-1181.44			-176.56			-92.15	-501.44
2020	2	21		-289.65		-1356.1	-1185.59			-185.15			-84.26	-499.22
2020	2	22		-286.54		-1333.89	-1178.7			-189.52			-76.59	-493.59
2020	2	23		-285.74		-1321.12	-1166.66			-188.96			-76.23	-487.85
2020	2	24		-288.02		-1336.72	-1161.87			-186.65			-86.43	-486.61
2020	2	25		-294.66		-1365.33	-1170.26			-186.28			-96.54	-490.99
2020	2	26		-290.72		-1360.43	-1185.25			-191.18			-86.59	-496.04
2020	2	27		-285.95		-1327.66	-1179.56			-197.71			-73.05	-489.93
2020	2	28		-280.94		-1288.03	-1160.77			-196.77			-62.63	-481
2020	2	29		-276.26		-1256.93	-1131.25			-190.29			-61.84	-469.48
2020	3	1		-273.68		-1233.31	-1090.51			-183.18			-70.4	-452.67
2020	3	2		-272.98		-1223.55	-1061.74			-175.92			-79.9	-441.91
2020	3	3		-271.14		-1201.53	-1045.64			-169.27			-76.95	-437.18
2020	3	4		-270.04		-1180.33	-1023.26			-162.3			-77.53	-429.48
2020	3	5		-272.89		-1202.27	-992.1			-155.56			-104.08	-417.27
2020	3	6		-275.64		-1225.94	-996.82			-148.84			-113.56	-422.99
2020	3	7		-282.98		-1265.05	-1020.46			-144.09			-121.29	-437.19
2020	3	8		-282.96		-1274.51	-1044.42			-143.35			-114.04	-449.53
2020	3	9		-283		-1272.14	-1053.78			-146.75			-108.18	-452.52
2020	3	10		-283.92		-1278.96	-1062.11			-150.87			-107.42	-454.62
2020	3	11		-282.03		-1271.86	-1069.42			-156.29			-100.22	-455.56

2020	3	12		-278.3		-1254.32	-1065.21			-160.81			-93.55	-451.2
2020	3	13		-289.26		-1309.4	-1061.65			-162.01			-122.87	-448.82
2020	3	14		-299.06		-1371.57	-1107.77			-164.67			-130.9	-470.55
2020	3	15		-304.63		-1397.45	-1162.43			-175.73			-116.51	-492.35
2020	3	16		-304.83		-1406.76	-1204.52			-196.29			-100.12	-503.11
2020	3	17		-297.75		-1382.92	-1227.08			-226.58			-76.92	-499.25
2020	3	18		-299.6		-1381.46	-1215.46			-247.34			-82	-483.06
2020	3	19		-302.47		-1391.68	-1222.89			-261.78			-83.4	-479.56
2020	3	20		-303.83		-1399.32	-1242.42			-285.62			-77.45	-477.4
2020	3	21		-304.28		-1402.39	-1262.72			-316.86			-68.84	-471.93
2020	3	22		-299.38		-1384.25	-1267.02			-347.15			-57.62	-458.94
2020	3	23		-289.17		-1351.24	-1243.75			-358.59			-52.75	-441.58
2020	3	24		-284.95		-1310.83	-1201.66			-349.96			-53.58	-424.85
2020	3	25		-282.54		-1286.64	-1174.54			-332.77			-55.05	-419.89
2020	3	26		-283.74		-1289.41	-1161.93			-315.42			-62.74	-422.25
2020	3	27		-275.75		-1252.44	-1149.6			-305.66			-50.42	-420.97
2020	3	28		-271.77		-1214.75	-1105.62			-291.53			-53.56	-406.05
2020	3	29		-273.51		-1223.91	-1064.42			-271.95			-78.74	-395.24
2020	3	30		-276.39		-1233.4	-1056.61			-256.11			-87.4	-399.25
2020	3	31		-275.25		-1235.23	-1060.45			-246.7			-86.39	-405.88
2020	4	1		-275.84		-1232.94	-1059.2			-240.05			-85.87	-408.58
2020	4	2		-283.07		-1262.59	-1065.03			-236.18			-97.78	-413.43
2020	4	3		-287.7		-1304.14	-1091.72			-236.64			-105.21	-426.54
2020	4	4		-286.53		-1303.94	-1128.5			-246.69			-86.72	-439.9
2020	4	5		-285.66		-1295.5	-1136.35			-259.5			-78.58	-437.42
2020	4	6		-282.4		-1275.4	-1134.51			-264.64			-69.44	-433.93
2020	4	7		-277.29		-1249.26	-1117.5			-264.38			-64.88	-425.56
2020	4	8		-272.33		-1216.62	-1086.46			-259.98			-64.08	-412.24
2020	4	9		-270.51		-1194.35	-1058.77			-248.83			-66.79	-403.97
2020	4	10		-259.69		-1133.1	-1039.55			-236.2			-45.78	-400.68

2020	4	11		-251.15		-1064.04	-985.63			-223.95			-38.21	-379.84
2020	4	12		-260.07		-1083.63	-934.48			-209.75			-73.58	-361.36
2020	4	13	-65633218.18	-272.03	-559.55	-1161.35	-914.72	-847.23	-182.48	-195.03	144.84	-331.38	-122.32	-358.85
2020	4	14	-55120724.29	-256.68	-539.83	-1119.65	-924.25	-856.01	-171.69	-183.46	159.09	-341.16	-96.7	-369.39
2020	4	15	-27798407.94	-204.38	-456.34	-943.05	-889.69	-824.17	-165.17	-176.47	184.92	-328.5	-25.68	-355.61
2020	4	16	-16448967.02	-171.64	-384.59	-791.3	-839.7	-778.12	-158.43	-169.23	197.77	-308.85	25.2	-334.23
2020	4	17	-8286024.27	-136.64	-338.14	-693.06	-781.12	-724.16	-149.93	-160.11	194.01	-286.12	45.03	-309.5
2020	4	18	-820870.12	-63.41	-296.01	-603.96	-727.72	-674.97	-141.44	-151.01	190.48	-265.77	62.88	-287.36
2020	4	19	-150743.97	-36.19	-224.27	-452.21	-684.18	-634.86	-134.21	-143.26	206.3	-249.33	116.98	-269.46
2020	4	20	-33568.44	-22.07	-24.24	-29.14	-605.7	-562.57	-110.44	-117.77	270.16	-225.06	289.28	-242.97
2020	4	21	-4995.68	-11.85	-17.05	-13.94	-127.94	-122.45	-21.01	-21.87	53.7	-49.72	58	-52.04
2020	4	22	-5084.44	-11.92	-16.5	-12.78	-30.99	-33.14	-17.57	-18.18	9.32	-6.78	10.11	-5.4
2020	4	23	-5089.71	-11.92	-16.53	-12.84	-22.47	-25.29	-17.16	-17.74	5.38	-3.06	5.81	-1.36
2020	4	24	-5125.78	-11.95	-16.56	-12.91	-20.7	-23.66	-16.79	-17.34	4.55	-2.44	4.89	-0.68
2020	4	25	-5142.39	-11.96	-16.59	-12.97	-18.93	-22.03	-16.52	-17.05	3.72	-1.76	3.98	0.06
2020	4	26	-5221.34	-12.02	-16.66	-13.1	-11.88	-15.54	-16.37	-16.89	0.44	1.41	0.39	3.5
2020	4	27	-5243.08	-12.04	-16.73	-13.26	-11.91	-15.56	-16.31	-16.83	0.42	1.38	0.33	3.46
2020	4	28	-5265.32	-12.05	-16.82	-13.46	-12.01	-15.66	-16.3	-16.82	0.42	1.32	0.28	3.4
2020	4	29	-5428.69	-12.17	-17.01	-13.85	-12.1	-15.74	-16.32	-16.83	0.37	1.29	0.13	3.36
2020	4	30	-5531.25	-12.25	-17.25	-14.36	-12.24	-15.87	-16.31	-16.83	0.31	1.22	-0.06	3.29
2020	5	1	-5729.6	-12.39	-17.55	-15	-12.47	-16.08	-16.26	-16.78	0.26	1.09	-0.27	3.15
2020	5	2	-6411.22	-12.85	-17.96	-15.87	-12.84	-16.42	-15.93	-16.41	0.23	0.75	-0.51	2.79
2020	5	3	-8434.23	-14.05	-18.6	-17.23	-13.66	-17.18	-14	-14.35	0.29	-0.59	-0.78	1.35
2020	5	4	-6208.58	-12.71	-17.86	-15.64	-13.71	-17.23	-13.23	-13.53	0.68	-1	0.03	0.91
2020	5	5	-7099.53	-13.28	-18.18	-16.33	-13.87	-17.37	-13.24	-13.53	0.59	-1.07	-0.23	0.83
2020	5	6	-13066.23	-16.2	-19.09	-18.25	-15.22	-18.62	-14.23	-14.59	0.76	-1.19	-0.52	0.69
2020	5	7	-30259.29	-21.33	-20.02	-20.22	-17.39	-20.61	-15.88	-16.37	1.3	-1.37	-0.41	0.49
2020	5	8	-24424.86	-19.88	-20.42	-21.06	-19.32	-22.39	-17.36	-17.95	1.99	-1.52	0.13	0.32
2020	5	9	-31089.03	-21.52	-20.48	-21.19	-20.69	-23.65	-18.33	-19	2.59	-1.66	0.75	0.15
2020	5	10	-44441.71	-24.2	-20.78	-21.82	-21.91	-24.78	-19.14	-19.86	3	-1.82	1.04	-0.03

2020	5	11	-58060.16	-26.42	-21.08	-22.46	-22.83	-25.62	-19.74	-20.51	3.27	-1.94	1.19	-0.16
2020	5	12	-80051.66	-29.37	-21.4	-23.13	-23.6	-26.34	-20.27	-21.07	3.47	-2.03	1.24	-0.27
2020	5	13	-105480.27	-32.17	-21.79	-23.97	-24.28	-26.96	-20.78	-21.62	3.59	-2.09	1.16	-0.33
2020	5	14	-139759.61	-35.3	-22.27	-24.98	-25.02	-27.65	-21.31	-22.19	3.69	-2.17	1.02	-0.42
2020	5	15	-184267	-38.67	-22.67	-25.82	-25.66	-28.23	-21.83	-22.75	3.78	-2.2	0.92	-0.46
2020	5	16	-258100.75	-43.23	-23.29	-27.13	-26.33	-28.85	-22.34	-23.29	3.78	-2.25	0.6	-0.52
2020	5	17	-410012.12	-50.39	-24.11	-28.86	-27.18	-29.63	-22.92	-23.92	3.76	-2.35	0.16	-0.63
2020	5	18	-674151.15	-59.41	-24.77	-30.28	-27.95	-30.34	-23.53	-24.57	3.78	-2.4	-0.16	-0.69
2020	5	19	-1015340.97	-68.05	-25.31	-31.41	-28.5	-30.84	-24.1	-25.18	3.77	-2.37	-0.46	-0.66
2020	5	20	-65.02	-78.64	-26.38	-33.44	-28.98	-29.81	-25.33	-25.76	2.72	-1.24	-1.23	-0.61
2020	5	21	-29.2	-38.87	-25.78	-29.73	-29.38	-29.73	-25.33	-26.24	2.97	-1.2	0.83	-0.57
2020	5	22	-14.69	-12.96	-18.57	-15.15	-23.43	-25.86	-20.99	-22.06	4.65	-1.44	5.14	0.31
2020	5	23	-16.18	-13.62	-18.16	-16.55	-19.27	-24.65	-19.8	-19.1	4.25	-1.42	2.36	0.91
2020	5	24	-18.23	-17.69	-19.75	-19.27	-20.73	-25.22	-20.76	-19.94	3.74	-1.23	1.73	0.6
2020	5	25	-20.87	-25.98	-21.73	-22.47	-23.18	-26.24	-21.9	-21.32	3.25	-1.17	1.36	0.07
2020	5	26	-23.51	-31.3	-23.2	-24.75	-25.32	-27.24	-22.91	-22.73	3.02	-1.16	1.29	-0.29
2020	5	27	-25.57	-33.73	-23.94	-26.2	-26.81	-27.9	-23.7	-23.98	2.98	-1.1	1.31	-0.41
2020	5	28	-26.68	-33.68	-24.52	-27.74	-27.79	-28.33	-24.26	-24.93	2.91	-1.04	1.02	-0.43
2020	5	29	-32.51	-38.73	-25.34	-30.12	-28.79	-28.97	-24.8	-25.81	2.81	-1.08	0.33	-0.49
2020	5	30	-46.48	-49.57	-26.17	-34.36	-29.92	-29.79	-25.51	-26.77	2.81	-1.14	-1.22	-0.58
2020	5	31	-63.18	-56.81	-26.38	-38.27	-31.05	-30.51	-26.09	-27.71	3.07	-1.21	-2.61	-0.67
2020	6	1	-15.01	-13.6	-14.83	-15.62	-18.25	-22.98	-18.27	-18.9	5.07	-1.35	2.31	1.33
2020	6	2	-17.98	-18.03	-17.37	-19.61	-19.3	-24.39	-19.14	-19.15	4.51	-1.63	0.85	0.93
2020	6	3	-18.86	-18.65	-19.57	-22.04	-22.07	-26.05	-20.87	-20.89	4.24	-1.59	1.01	0.41
2020	6	4	-19.98	-22.01	-20.98	-22.87	-24.1	-27.03	-22.08	-22.16	4.03	-1.48	1.62	0.03
2020	6	5	-21.93	-27.56	-22.31	-24.6	-25.85	-27.76	-23.03	-23.38	3.73	-1.37	1.62	-0.24
2020	6	6	-19.23	-21.76	-22.37	-22.81	-26.99	-28.02	-23.38	-24.29	3.82	-1.32	3.09	-0.35
2020	6	7	-14.32	-12.87	-16.09	-14.94	-18.92	-22.75	-18	-18.77	4.33	-1.38	2.99	0.92
2020	6	8	-15.37	-13.14	-15.07	-15.42	-14.85	-20.47	-15.43	-15.13	3.7	-1.52	0.71	1.14
2020	6	9	-17.42	-15.57	-16.76	-18.08	-16.64	-22.49	-17.09	-16.8	3.87	-1.7	0.28	1.08

2020	6	10	-19.95	-23.06	-18.79	-21.59	-19.63	-24.62	-19	-19.01	3.92	-1.81	0.02	0.69
2020	6	11	-22.21	-30.89	-20.69	-24.73	-22.78	-26.17	-20.58	-20.99	3.74	-1.79	0.03	0.1
2020	6	12	-23.7	-32.09	-22.34	-27.68	-25.31	-27.36	-21.83	-22.64	3.51	-1.76	-0.18	-0.34
2020	6	13	-21.62	-24.02	-23.69	-30.61	-27.09	-28.29	-22.76	-23.92	3.3	-1.77	-0.76	-0.58
2020	6	14	-16.74	-14.72	-22.94	-21	-27.62	-27.92	-22.15	-24.45	3.49	-1.89	4.31	-0.59
2020	6	15	-15.54	-13.6	-21.65	-16.95	-26.43	-27.56	-21.75	-23.64	3.95	-1.9	5.74	-0.39
2020	6	16	-17.61	-15.36	-21.84	-18.73	-25.23	-27.6	-21.83	-22.73	3.88	-1.88	4.25	-0.25
2020	6	17	-19.27	-19.03	-22.95	-22.27	-26.51	-28.25	-22.7	-23.6	3.65	-1.77	3.12	-0.45
2020	6	18	-20.07	-21.59	-23.36	-22.86	-27.38	-28.62	-23.35	-24.32	3.63	-1.64	3.26	-0.53
2020	6	19	-24.91	-31.18	-24.39	-26.09	-28.62	-29.3	-24.12	-25.32	3.45	-1.59	2.27	-0.65
2020	6	20	-41.58	-42.05	-25.77	-30.8	-30.03	-30.3	-25.04	-26.47	3.26	-1.63	0.62	-0.78
2020	6	21	-64.53	-59.75	-26.65	-35.98	-31.12	-31.16	-25.8	-27.47	3.26	-1.68	-1.43	-0.83
2020	6	22	-101.11	-83.84	-27.64	-45.18	-32.2	-32.08	-26.58	-28.53	3.22	-1.75	-5.49	-0.84
2020	6	23	-220.21	-127.99	-29.21	-67.76	-33.85	-33.47	-27.66	-29.93	3.13	-1.91	-15.96	-0.96
2020	6	24	-236.29	-109.97	-29.8	-91.55	-34.66	-34.28	-28.24	-30.79	3.24	-2.02	-27.44	-0.94
2020	6	25	-236.68	-69.93	-30.21	-117.09	-35.29	-34.89	-28.79	-31.52	3.34	-2.05	-39.9	-0.88
2020	6	26	-314.52	-107.93	-31.3	-162.25	-36.39	-36.1	-29.75	-32.71	3.4	-2.18	-61.93	-0.84
2020	6	27	-146.55	-81.11	-31.63	-189.83	-36.95	-36.76	-30.21	-33.51	3.57	-2.27	-75.44	-0.72
2020	6	28	-35.84	-32.25	-31.24	-193.39	-36.94	-36.6	-30.17	-33.78	3.68	-2.22	-77.22	-0.58
2020	6	29	-26.81	-24.05	-31.29	-193.41	-36.95	-36.6	-30.22	-34.05	3.65	-2.19	-77.23	-0.45
2020	6	30	-23.21	-21.56	-31.24	-187.4	-36.99	-36.49	-29.83	-34.35	3.63	-2.33	-74.2	-0.32
2020	7	1	-15.08	-13.05	-23.19	-19.26	-32.84	-32.75	-27.15	-31.08	5.78	-1.8	7.79	0.12
2020	7	2	-17.1	-13.84	-20.81	-17.6	-26.08	-29.3	-24.01	-24.64	5.25	-1.64	5.24	0.28
2020	7	3	-20.05	-19.83	-23.86	-21.82	-27.99	-30.13	-24.98	-25.6	4.14	-1.58	4.08	-0.19
2020	7	4	-23.85	-28.25	-25.73	-25.84	-30.07	-31.14	-25.95	-27.2	3.71	-1.59	3.11	-0.44
2020	7	5	-26.99	-31.88	-26.54	-28.37	-31.26	-31.82	-26.63	-28.31	3.64	-1.6	2.44	-0.47
2020	7	6	-33.75	-35.09	-27.69	-31.47	-32.58	-32.81	-27.46	-29.53	3.56	-1.68	1.56	-0.53
2020	7	7	-43.61	-39.58	-28.55	-34.87	-33.83	-33.41	-27.43	-30.75	3.43	-1.99	0.48	-0.54
2020	7	8	-14.38	-13.15	-21.53	-15.53	-29.09	-29.8	-23.3	-27.22	5.14	-2.25	7.78	0.07
2020	7	9	-17.09	-14.56	-23.06	-18.3	-26.41	-29.73	-23.14	-24.57	4.34	-2.3	5.06	0.08

2020	7	10	-15.43	-13.65	-21.27	-16.45	-24.43	-28.85	-22.2	-23.29	4.79	-2.33	4.99	0.43
2020	7	11	-19.01	-17.92	-23.78	-20.45	-25.96	-29.63	-23.24	-23.91	3.93	-2.2	3.76	-0.03
2020	7	12	-22.7	-25.66	-25.71	-24.66	-28.84	-30.77	-24.58	-25.9	3.53	-2.1	3.09	-0.47
2020	7	13	-27.71	-31.92	-26.75	-27.74	-30.86	-31.8	-25.87	-27.63	3.53	-1.97	2.56	-0.62
2020	7	14	-44.95	-39.26	-28.44	-32.75	-32.97	-33.53	-27.63	-29.56	3.55	-1.95	1.11	-0.7
2020	7	15	-105.14	-63.14	-30.66	-43.25	-35.33	-35.91	-29.69	-31.87	3.62	-2.11	-2.96	-0.73
2020	7	16	-152.02	-78.96	-31.99	-52.5	-37.05	-37.48	-30.96	-33.63	3.75	-2.26	-6.72	-0.71
2020	7	17	-15.21	-13.89	-29.84	-17.44	-36	-35.85	-29.79	-33	4.01	-2.03	10.28	-0.5
2020	7	18	-18.73	-19.76	-30.26	-21.96	-35.74	-35.86	-29.78	-32.72	3.8	-2.04	7.89	-0.51
2020	7	19	-22.61	-29	-30.73	-26.31	-36.14	-36.14	-30.09	-33.03	3.7	-2.03	5.92	-0.56
2020	7	20	-32.21	-36.14	-31.83	-30.62	-37.01	-37.06	-30.81	-33.7	3.61	-2.12	4.19	-0.65
2020	7	21	-60.9	-52.39	-33.39	-37.59	-38.11	-38.55	-31.94	-34.63	3.58	-2.3	1.26	-0.74
2020	7	22	-47.91	-36.33	-34.12	-45.44	-38.88	-39.43	-32.59	-35.46	3.66	-2.42	-2.28	-0.71
2020	7	23	-19.03	-17.72	-33.71	-35.69	-38.78	-38.8	-31.97	-35.55	3.55	-2.42	2.54	-0.62
2020	7	24	-16.24	-13.7	-32.25	-18.58	-38.23	-37.87	-30.91	-35.17	3.81	-2.48	10.83	-0.53
2020	7	25	-19.04	-18.45	-32.31	-21.94	-38.17	-37.99	-31.16	-35.14	3.84	-2.42	9.12	-0.52
2020	7	26	-25.31	-27.07	-33.31	-26.78	-38.83	-38.95	-32.24	-35.62	3.82	-2.35	7.02	-0.6
2020	7	27	-66.01	-40.16	-36.12	-34.99	-40.66	-41.56	-34.48	-36.95	3.72	-2.54	3.84	-0.85
2020	7	28	-212.61	-75.65	-40.76	-53.9	-43.36	-45.95	-37.76	-39.09	3.59	-3.09	-4.27	-1.14
2020	7	29	-355.97	-136.37	-45.35	-97.04	-46.08	-49.97	-40.93	-41.47	3.31	-3.52	-24.48	-1.31
2020	7	30	-450.8	-236.16	-49.38	-172.73	-48.74	-53.4	-43.86	-43.92	3.01	-3.77	-60.99	-1.41
2020	7	31	-515.49	-388.79	-54.14	-265.76	-51.93	-56.84	-47.14	-46.76	2.35	-3.85	-105.92	-1.59
2020	8	1	-573.05	-601.06	-59.89	-353.66	-55.69	-60.38	-50.88	-50.27	1.25	-3.75	-147.98	-1.71
2020	8	2	-621.28	-812.36	-65.62	-426	-59.53	-63.64	-54.69	-54.08	0.01	-3.47	-182.23	-1.73
2020	8	3	-658.88	-943.91	-68.4	-462.06	-61.19	-65.46	-56.67	-56.15	-0.47	-3.39	-199.44	-1.52
2020	8	4	-518.09	-222.38	-68.39	-498.39	-61.78	-65.57	-56.74	-56.96	-0.41	-3.42	-217.31	-1.41
2020	8	5	-550.4	-234.06	-72.38	-532.37	-64.78	-67.83	-59.32	-60.07	-1.28	-3.26	-232.8	-1.36
2020	8	6	-647.58	-515.55	-81.02	-568	-69.16	-72.08	-63.49	-64.32	-3.47	-3.29	-248.42	-1.42
2020	8	7	-390.51	-474.08	-83.85	-602.07	-69.35	-73.78	-64.76	-64.95	-4.04	-3.51	-265.36	-1.2
2020	8	8	-19.62	-15.92	-79.15	-383.47	-67.41	-71.74	-63.06	-63.84	-2.71	-3.34	-157.03	-0.79

2020	8	9	-24.31	-25.04	-77.81	-98.13	-67.33	-71.06	-62.32	-64.07	-2.38	-3.37	-14.4	-0.63
2020	8	10	-47.58	-39.29	-81.69	-95.66	-69.21	-72.3	-63.49	-65.66	-3.69	-3.41	-12.23	-0.77
2020	8	11	-155.76	-68.66	-88.27	-146.99	-71.41	-75.46	-66	-67	-5.4	-3.73	-36.79	-1.21
2020	8	12	-23.91	-18.08	-87.69	-191.39	-70.79	-75.78	-66.05	-66.62	-4.96	-3.86	-59.3	-1.08
2020	8	13	-25.84	-23.34	-84.75	-175.81	-70.18	-74.36	-64.9	-66.6	-4.19	-3.73	-51.81	-0.79
2020	8	14	-49.51	-35.86	-88.14	-167.25	-71.74	-75.44	-65.81	-68.18	-5.35	-3.82	-46.76	-0.78
2020	8	15	-168.16	-67.44	-96	-207.97	-74.14	-79.32	-68.51	-69.99	-7.34	-4.41	-65.91	-1.08
2020	8	16	-411.87	-116.31	-113.64	-288.4	-80.67	-86.07	-73	-75.96	-12.78	-5.53	-102.87	-1.35
2020	8	17	-633.27	-216.55	-145.7	-402.01	-90.96	-94	-78.41	-84.93	-24.85	-6.79	-154.52	-2.02
2020	8	18	-710.34	-422.14	-184.69	-481.67	-101.76	-99.9	-83.24	-92.77	-41.39	-7.33	-188.96	-3.49
2020	8	19	-781.18	-698.12	-230.41	-549.37	-116.53	-105.85	-89.15	-100.45	-61.28	-7.35	-215.42	-7.04
2020	8	20	-774.23	-851.81	-268.82	-589.35	-128.74	-110.56	-93.25	-103.6	-78.13	-7.65	-229.31	-11.57
2020	8	21	-20.59	-15.99	-275.02	-601.52	-120.31	-110.12	-91.57	-96.57	-81.45	-8.28	-239.61	-10.87
2020	8	22	-19.71	-16.68	-247.98	-415.78	-108.8	-99.92	-86.46	-92.48	-73.03	-5.73	-152.49	-7.16
2020	8	23	-18.88	-14.59	-225.22	-26.61	-104.22	-95.61	-83.74	-90.98	-63.81	-4.93	39.81	-5.62
2020	8	24	-21.93	-20.71	-196.83	-28.05	-101.47	-95.34	-83.41	-90.47	-49.74	-4.96	37.71	-4.5
2020	8	25	-19.28	-14.13	-170.66	-26.12	-98.85	-94.81	-82.35	-89.06	-36.93	-5.23	37.37	-3.9
2020	8	26	-19.7	-15.24	-151.73	-25.92	-97.02	-93.93	-81.4	-88.02	-27.9	-5.26	36.55	-3.5
2020	8	27	-23.17	-19.99	-140.78	-27.3	-97.04	-93.48	-80.97	-88.45	-22.65	-5.26	35.87	-3.29
2020	8	28	-36.9	-27.73	-144.63	-31.24	-100.68	-94.9	-82.06	-90.48	-23.86	-5.42	35.72	-4.1
2020	8	29	-107.75	-39.45	-168.27	-38.48	-108.22	-99.68	-85.88	-94.3	-33.29	-5.9	35.87	-5.96
2020	8	30	-354.66	-68.26	-221.1	-57.36	-124.78	-108.33	-92.3	-101.83	-55.38	-7.02	34.71	-10.47
2020	8	31	-592.01	-108.34	-273.26	-94.67	-133.59	-114.93	-96.11	-104.29	-78.17	-8.41	20.46	-13.65
2020	9	1	-726.18	-182.13	-333.82	-185.1	-172.21	-124.76	-105.23	-121.84	-103.53	-8.76	-5.44	-24.19
2020	9	2	-856.4	-334.06	-409.87	-314.89	-217.31	-133.69	-112.55	-129.77	-137.09	-9.57	-47.79	-42.77
2020	9	3	-896.69	-479.8	-465.05	-406.6	-239.24	-139.1	-115.9	-134.81	-161.98	-10.6	-82.68	-51.22
2020	9	4	-953.07	-658.35	-510.79	-484.94	-274.09	-145.02	-119.75	-139.09	-181.89	-11.64	-104.42	-66.5
2020	9	5	-985.93	-845.89	-538.4	-523.85	-274.42	-147.91	-120.65	-139.31	-194.24	-12.63	-123.71	-66.56
2020	9	6	-1047.35	-1013.48	-571.45	-582.64	-293.38	-151.37	-122.45	-141.29	-209.04	-13.46	-143.63	-75.04
2020	9	7	-1143.71	-1134.76	-613.71	-636.8	-275.16	-153.17	-122.66	-138.69	-229.27	-14.26	-179.82	-67.23

2020	9	8	-1069.22	-1162.19	-670.52	-688.44	-294.85	-154.89	-123.59	-148.29	-256.82	-14.65	-195.79	-72.28
2020	9	9	-1092.85	-1317.78	-685.99	-731.25	-379.04	-161.08	-128.04	-160.1	-261.45	-15.52	-175.1	-108.47
2020	9	10	-1100.05	-1480.22	-685.11	-741.25	-446.04	-167.29	-133.08	-174.8	-257.91	-16.11	-146.61	-134.62
2020	9	11	-1191.15	-1774.56	-694.16	-788.42	-523.46	-174.18	-138.09	-185.34	-258.99	-17.05	-131.48	-168.06
2020	9	12	-1328.04	-2066.3	-738.99	-840.88	-518.16	-179.34	-139.49	-176.24	-278.83	-18.93	-160.36	-169.96
2020	9	13	-1367.25	-2130.53	-770.54	-884.06	-471.87	-179.66	-137.38	-167.22	-294.44	-20.14	-205.09	-151.33

year	month	day	Soil temperature (degrees Celsius)																											
			5 cm.C.x	5 cm.C.L.x	5 cm.C.y	5 cm.C.L.y	X-avg	Y-avg	20 cm.C.x	20 cm.C.L.x	20 cm.C.y	20 cm.C.L.y	X-avg	Y-avg	40 cm.C.x	40 cm.C.L.x	40 cm.C.y	40 cm.C.L.y	X-avg	Y-avg	60 cm.C.L.x	60 cm.C.L.y	60 cm.C.y	X-avg	Y-avg	100 cm.C.x	100 cm.C.y	150 cm.C.x	150 cm.C.y	
2019	6	18	19.0625	19.14167	25.13333	25.33333	19.10208	25.23333	17.70417	18.54583	22.21667	22.5125	18.125	22.36458	16.325	16.8625	18.7625	19.10833	16.59375	17.8125	16.23333	17.42083	16.9	16.23333	17.16042	13.1375	13.80417	9.345833	7.9	
2019	6	19	14.29583	14.27917	15.65972	15.67222	14.2875	15.66997	15.79306	16.25417	18.15894	18.03472	16.02361	18.09583	15.76944	16.0375	18.17222	18.39306	15.90347	17.10486	15.45417	16.81944	16.4625	15.45417	16.64097	12.32639	13.05328	9.329167	7.8	
2019	6	20	12.90556	12.78611	14.44306	14.76111	12.84583	14.60208	13.28333	13.74028	14.76389	14.79028	13.51181	14.77708	14.35139	14.62917	16.01528	16.14861	14.49028	15.32222	14.69583	15.92917	15.73889	14.69583	15.83403	11.93889	12.7375	9.415277	7.968056	
2019	6	21	14.52778	14.35694	16.3875	16.79861	14.44236	16.59306	13.77917	14.22083	15.79722	15.97083	14	15.88403	13.56944	13.8625	15.25556	15.39722	13.71597	14.55903	13.93611	15.06389	14.9375	13.93611	15.00069	11.8125	12.60139	9.525	8.068056	
2019	6	22	15.44028	15.25417	18.75694	19.06806	15.34722	18.9125	14.3375	14.75417	17.00833	17.22361	14.54583	17.11597	13.50417	13.825	15.34583	15.49583	13.66458	14.58542	13.58333	14.75833	14.60139	13.58333	14.67986	11.66528	12.47361	9.626389	8.173611	
2019	6	23	16.01806	15.81667	19.54389	19.55894	15.91736	19.56042	14.96944	15.34028	18.3125	18.425	15.15486	18.36875	13.6625	14.03472	16.04167	16.20833	13.84861	15.03819	15.33194	14.83194	14.64444	13.33194	14.73819	11.6	12.4	9.7	8.293056	
2019	6	24	14.71528	14.57639	16.88889	17.01806	14.64583	16.95347	14.61389	15.00833	17.33333	17.37639	14.81111	17.35486	13.82222	14.16667	16.36667	16.50139	13.99444	15.26667	13.6	15.05694	14.86806	13.6	14.9625	11.6	12.4	9.765278	8.380505	
2019	6	25	15.19583	15.02083	18.22917	18.60417	15.10833	18.41667	14.29583	14.70833	17.00556	17.20417	14.50208	17.10486	13.56389	13.88472	15.78194	15.92083	13.72431	14.83333	13.55417	15.025	14.86528	13.55417	14.94514	11.6	12.46528	9.826389	8.483333	
2019	6	26	15.8875	15.66944	19.27222	19.49444	15.77847	19.38333	14.80556	15.18333	18.34367	18.29861	14.99444	18.22014	13.62361	13.96944	16.11528	16.28264	13.79653	15.04236	13.5	14.99444	14.85972	13.5	14.92708	11.6	12.5	9.9	8.561111	
2019	6	27	15.65972	15.47361	18.61806	18.87639	15.56667	18.74722	14.83056	15.20417	17.94028	18.08056	15.01736	18.01042	13.77222	14.11111	16.40833	16.55694	13.94367	15.25972	13.575	15.19722	15.0375	13.575	15.11736	11.6	12.55278	9.965278	8.654367	
2019	6	28	16.76944	16.58333	19.72222	20.22778	16.67639	19.975	15.5625	15.94028	18.91528	19.09861	15.75139	19.08094	13.89722	14.21528	16.83333	16.78889	14.05625	15.42431	13.65	15.33333	15.1625	13.65	15.24792	11.6	12.63611	10.01667	8.704366	
2019	6	29	15.22361	15.05	17.60139	17.96667	15.13681	17.78403	14.80278	15.21111	17.48889	17.64028	15.00694	17.56458	14.05972	14.36528	16.65278	16.81806	14.2125	15.50903	13.85	15.33194	15.37361	13.85	15.45278	11.62639	12.74444	10.15139	8.8	
2019	6	30	16.62639	16.40833	19.55833	19.71111	16.51736	19.53472	15.24583	15.60278	18.19861	18.39028	15.42431	18.29444	13.99861	14.35	16.51944	16.67361	14.17431	15.43472	13.9	15.50417	15.4	13.9	15.45208	11.70556	12.85556	10.20139	8.8875	
2019	7	1	14.75694	14.68806	16.04583	16.31944	14.7125	16.18264	15.12639	15.52361	17.31667	17.42917	15.325	17.37292	14.27222	14.60833	16.79861	16.95694	14.44028	15.70347	15.99444	15.65278	15.52778	13.99444	15.59028	11.8	12.94028	10.29861	8.948611	
2019	7	2	13.50833	13.22361	15.05417	15.34583	13.29097	15.2	13.31528	13.725	15.19028	15.32639	13.52014	15.25833	13.69167	13.97361	15.67083	15.79722	13.83264	14.82222	13.89861	15.47639	15.42778	13.89861	15.45208	11.82083	13.04444	10.33889	9.041667	
2019	7	3	14.30833	14.18472	17.47222	17.82778	14.27153	17.65	13.70278	14.10972	16.4375	16.62083	13.90625	16.52917	13.33333	13.60094	15.39306	15.53333	13.47014	14.5	13.56667	15.09167	15.09583	13.56667	15.09375	11.9	13.1	10.40694	9.1	
2019	7	4	14.58194	14.4125	18.29583	18.47778	14.49722	18.38681	13.89028	14.28889	17.28889	17.40972	14.08958	17.34931	13.31611	13.65278	15.77778	15.92778	13.46944	14.69028	13.47639	15.07222	15.06944	13.47639	15.07083	11.82222	13.04861	10.5	9.197222	
2019	7	5	15.23194	15.04722	18.73472	18.88194	15.19958	18.80833	14.31528	14.70556	17.84306	17.90139	14.51042	17.87222	13.42222	13.69028	16.18806	16.3125	13.55625	14.92917	13.46389	15.20417	15.18333	13.46389	15.19375	11.8	13.00417	10.50278	9.283333	
2019	7	6	15.62361	15.39722	18.85	19.04722	15.51042	18.94861	14.61111	15.00139	17.90833	17.96667	14.80625	17.9375	13.58889	13.94028	16.36944	16.50972	13.76458	15.15486	13.5	15.3625	15.36694	13.5	15.35972	11.8	13.1	10.59861	9.323611	
2019	7	7	16.64028	16.45417	19.37361	19.70833	16.54722	19.54097	15.34367	15.72778	18.66389	18.74306	15.53472	18.70347	13.85694	14.18472	16.68806	16.79583	14.02083	15.42639	13.625	15.48472	15.49167	13.625	15.48819	11.8	13.1	10.6	9.4	
2019	7	8	16.73889	16.51806	20.66111	21.02222	16.62847	20.84367	15.45139	15.83056	18.9875	19.09861	15.64097	19.04306	14.1125	14.44583	16.80694	16.96111	14.27917	15.62639	13.85278	15.68333	15.67361	13.85278	15.67847	11.86944	13.19722	10.62222	9.480555	
2019	7	9	15.63611	15.475	18.98194	19.23194	15.55556	19.10694	15.31806	15.71111	19.08194	19.0875	15.51458	19.08472	14.31806	14.64028	17.32917	17.49861	14.47917	15.98472	14.05	15.91389	15.89861	14.05	15.90625	11.9	13.275	10.7	9.5	
2019	7	10	15.31889	15.10694	18.1875	18.32917	15.21042	18.25833	14.67917	15.07778	17.89367	17.86944	14.87847	17.88056	14.10278	14.41111	16.54583	17.09167	14.25894	15.67847	14.07222	16.03889	16.03611	14.07222	16.0375	11.96528	13.37322	10.71389	9.586111	
2019	7	11	16.12778	15.89306	19.69028	19.84861	16.01042	19.76944	15.02778	15.42917	18.39861	18.38194	15.22847	18.39028	14.09028	14.39722	16.78472	16.92083	14.24375	15.59097	14	15.93611	16	14	15.96806	12.05139	13.48056	10.8	9.6375	
2019	7	12	17.50833	17.16806	22.46389	23.00972	17.33819	22.73681	15.65278	16.02778	20.21667	20.19306	15.84028	20.20486	14.22361	14.54583	17.1875	17.32361	14.38472	15.86667	14.06806	15.97917	16.05556	14.06806	16.01736	12.1	13.52639	10.81944	9.7	
2019	7	13	18.63333	18.33056	23.71806	24.40972	18.48194	24.06389	16.69444	17.04583	22.35	22.125	16.87014	22.1375	14.68611	15.00417	18.28333	18.46528	14.84514	16.64375	14.26667	16.375	16.37083	14.26667	16.37292	12.14028	13.6	10.9	9.745833	
2019	7	14	18.78333	18.45556	23.79722	24.46667	18.61944	24.13194	17.07083	17.43472	22.4375	22.42639	17.25278	22.43194	15.15	15.46667	18.93056	19.16111	15.30833	17.19861	14.58056	16.89167	16.86111	14.58056	16.87639	12.2	13.70417	10.9125	9.801389	
2019	7	15	18.65	17.79861	22.32083	22.85972	17.92431	22.59028	16.94444	17.29444	21.94722	21.89444	17.15444	21.92083	15.96111	15.69444	19.25972	19.5	15.52778	17.47708	14.84167	17.29861	17.24167	14.84167	17.27014	12.32917	13.9125	11	9.9	

2019	7	16	17.6375	17.35139	21.89722	22.48339	17.49444	22.19028	16.55	16.49583	21.31944	21.28056	16.72292	21.3	15.37222	15.68472	19.04028	19.28611	15.52847	17.3625	14.98194	17.45417	17.44444	14.98194	17.44931	12.43056	14.08861	11.04722	9.905555
2019	7	17	17.66667	17.41667	21.78333	21.51806	17.54167	22.15069	16.47961	16.79028	21.31528	21.29444	16.63194	21.30486	15.30278	15.61667	18.9625	19.19583	15.45972	17.28958	15	17.4875	17.4875	15	17.4875	12.55833	14.26111	11.1	10
2019	7	18	16.33056	16.21111	18.60528	18.99972	16.27083	18.8125	16.175	16.52639	19.82361	19.73611	16.35069	19.77986	15.31389	15.625	18.8972	19.07778	15.48944	17.24236	15.05556	17.54861	17.56389	15.05556	17.55625	12.61667	14.41667	11.19722	10.12639
2019	7	19	15.73472	15.54028	18.09583	18.56667	15.6375	18.33125	15.34861	15.7639	18.41528	18.32083	15.5375	18.38806	14.99444	15.29583	17.91667	18.07083	15.14514	16.60625	14.96944	17.31389	17.38333	14.96944	17.34861	12.7	14.50972	11.27778	10.2
2019	7	20	17.10278	16.84861	19.91667	20.72083	16.97969	20.31875	15.9125	16.18472	19.23472	19.24167	16.04861	19.23819	14.89167	15.18472	17.67222	17.84167	15.03819	16.42847	14.9	17.05417	17.16389	14.9	17.10903	12.77817	14.59444	11.94861	10.23611
2019	7	21	18.22778	18.01111	20.98333	21.79306	18.11944	21.38819	16.81528	17.075	20.37917	20.40417	16.94514	20.39167	15.19306	15.50139	18.0875	18.31111	15.34722	16.79444	14.95833	17.08806	17.16528	14.95833	17.11667	12.8	14.6	11.4	10.35556
2019	7	22	18.96194	18.80417	21.93194	22.81667	18.89306	22.37431	17.45972	17.72778	21.10139	21.16111	17.59375	21.53125	15.59028	15.90139	18.52639	18.76111	15.76583	17.21389	15.17083	17.27222	17.33472	15.17083	17.30347	12.85556	14.61806	11.49306	10.41667
2019	7	23	19.99583	19.78333	23.2875	24.19306	19.88958	23.74028	18.13194	18.41806	22.20417	22.25278	18.275	22.22847	15.99306	16.30417	19.05694	19.32917	16.14861	17.68056	15.43333	17.54583	17.59167	15.43333	17.56875	12.96528	14.70417	11.53333	10.5
2019	7	24	19.41944	19.25139	21.55	21.92083	19.33542	21.73542	18.64444	18.98472	22.1104	22.09583	18.81458	22.11389	16.52083	16.83056	19.76389	20.00278	16.67969	18.29722	15.7625	17.925	17.93889	15.7625	17.93194	13.05278	14.82222	11.6	10.6
2019	7	25	15.95972	15.84861	17.73056	17.95278	15.90417	17.84167	16.45972	16.84167	18.75417	18.6125	16.65069	18.68333	16.325	16.59367	18.9	19.07361	16.45833	17.74583	15.96944	18.02639	18.07361	15.96944	18.05	13.20139	14.96389	11.67917	10.625
2019	7	26	17.34444	17.125	19.82778	20.82639	17.23472	20.32708	16.19306	16.53333	19.16944	19.16944	16.36319	19.16944	15.69861	15.95417	18.00417	18.15417	15.82639	16.97917	15.7125	17.61111	17.75417	15.7125	17.68264	13.35139	15.09583	11.76111	10.70417
2019	7	27	17.2625	17.11944	19.10833	19.51944	17.19097	19.31389	16.51944	17.27639	19.94861	19.89444	17.09792	19.92153	15.80694	16.07917	18.40139	18.61111	15.94306	17.24028	15.6	17.46944	17.6	15.6	17.53472	13.4	15.1	11.83194	10.8
2019	7	28	18.60139	18.4125	18.54028	19.15556	16.50694	18.84792	15.98472	16.34583	18.39167	18.35694	18.16528	18.37431	15.64028	15.9	17.81667	17.97222	15.77014	16.85833	15.58056	17.41389	17.54861	15.58056	17.48125	13.40139	15.1	11.9	10.82222
2019	7	29	17.14722	16.95	19.35556	20.15833	17.04861	19.75694	16.37778	16.67861	19.15972	19.15972	16.52669	19.15972	15.55278	19.81111	17.78889	17.96667	15.68194	16.8	15.5	17.24306	17.4	15.5	17.32153	13.42639	15.1	11.94861	10.9
2019	7	30	17.32083	17.12917	18.99167	19.42917	17.225	19.21042	16.69861	16.97778	19.26944	19.22222	16.83819	19.24583	15.68333	15.95556	18.02361	18.20972	15.81944	16.98958	15.55833	17.27778	17.45556	15.55833	17.36667	13.5	15.1	12.00833	10.99861
2019	7	31	17.38472	17.175	19.12778	20.02083	17.27986	19.67431	16.61667	16.90833	19.07778	19.07083	16.7625	19.07431	15.72083	15.99306	17.86667	18.04028	15.85694	16.92986	15.6	17.29305	17.47639	15.6	17.38472	13.5	15.12861	12.1	11.62639
2019	8	1	18.16528	17.93333	20.3125	21.00694	18.04931	20.65972	17.09722	17.38472	19.95	19.97083	17.24097	19.96042	15.82778	16.09861	18.10556	18.29583	15.96319	17.10208	15.64444	17.30417	17.46944	15.64444	17.38681	13.54028	15.2	12.15	11.1
2019	8	2	19.48889	19.24722	21.4875	22.27361	19.36806	21.88056	17.91806	18.18889	20.80278	20.84861	18.05347	20.82589	16.11667	16.40417	18.47917	18.67917	18.28042	17.44167	15.77222	17.47083	17.62778	15.77222	17.54931	13.6	15.2	12.2	11.19583
2019	8	3	18.3125	18.18194	19.91528	20.54861	18.24722	20.23194	18.01111	18.2875	20.51389	20.53611	18.14931	20.525	16.54583	18.82917	18.51111	19.14583	16.6875	17.87014	18.03056	17.78611	17.86528	18.03056	17.80069	13.6625	15.24722	12.24722	11.2
2019	8	4	17.21944	17.04583	18.59028	19.41944	17.13264	19.00486	16.85417	17.13889	19.05417	19.08056	16.99653	19.06736	16.31944	16.59306	18.39861	18.6	16.45625	17.49583	16.14861	17.775	17.9625	16.14861	17.86875	13.78472	15.33194	12.3	11.29167
2019	8	5	18.07917	17.88333	19.93333	20.79583	17.98125	20.36458	17.13972	17.43611	19.72083	19.79028	17.29792	19.75556	16.16528	16.44306	18.19167	18.4125	16.30417	17.31736	16.00694	17.63889	17.8	16.00694	17.71944	13.9	15.4	12.375	11.33889
2019	8	6	17.31111	17.15556	19.41806	20.01528	17.23333	19.71667	17.12222	17.41944	19.77222	19.76806	17.27083	19.77014	16.25833	16.53611	18.41528	18.63333	16.39722	17.47569	16.06528	17.66667	17.8	16.06528	17.73333	13.91667	15.40278	12.40556	11.4
2019	8	7	16.74861	16.57083	18.30278	19.24861	16.65972	18.77969	16.40972	16.68889	18.8375	18.85278	16.54931	18.84514	16.04028	16.26528	18.11111	18.3	16.13278	17.18819	16.00972	17.65	17.79444	16.00972	17.72222	14	15.4875	12.5	11.40417
2019	8	8	17.9875	17.74861	20.25694	21.20139	17.86806	20.72917	16.86111	17.18056	19.70972	19.77083	18.99583	19.74028	15.91528	16.2	18.025	18.21914	16.05764	17.1125	15.9	17.5	17.7	15.9	17.6	14	15.5	12.54444	11.5
2019	8	9	16.65417	16.525	18.64444	19.07917	16.58958	18.86181	16.86806	17.16944	19.52083	19.46667	17.01875	19.48975	16.09722	16.35694	18.35	18.55139	16.22708	17.35347	15.95	17.57083	17.7625	15.95	17.66667	14	15.5	12.6	11.53889
2019	8	10	15.12917	14.93889	17.08889	17.54722	15.03403	17.31806	15.51667	15.81528	17.81944	17.725	15.66597	17.77222	15.73194	15.96944	17.79722	17.94861	15.8069	16.88333	15.86389	17.525	17.73611	15.86389	17.63056	14	15.5	12.6	11.6
2019	8	11	15.05694	14.84306	16.71944	16.98194	14.95	16.85069	15.22222	15.51944	17.49028	17.375	15.37083	17.43264	15.3125	15.55694	17.35417	17.50417	15.43472	16.45556	15.60417	17.24722	17.48194	15.60417	17.36458	14	15.5	12.67361	11.8
2019	8	12	15.26667	15.01944	16.96944	17.19167	15.14306	17.08056	15.08056	15.33194	17.10417	16.99306	15.18125	17.04861	15.02639	15.28194	16.9375	17.06528	15.15417	16.10972	15.38056	16.98889	17.24722	15.38056	17.11806	13.98472	15.44861	12.7	11.66528
2019	8	13	16.20278	15.97361	18.07639	18.69722	16.08819	18.38861	15.44167	15.72917	17.9722	17.74583	15.38542	17.77153	14.97361	15.20278	16.87861	17.01111	15.08819	16.03819	15.22361	16.775	17.03611	15.22361	16.90556	13.9	15.36944	12.7	11.7
2019	8	14	16.11667	15.89167	17.40833	18.45694	16.00417	17.93264	15.55	15.82222	17.6875	17.73472	15.68611	17.71111	15.04444	15.2875	16.92639	17.08611	15.16597	16.10694	15.2	16.74028	16.99028	15.2	16.86528	13.82917	15.3	12.7	11.75278

2019	8	15	17.3375	17.0778	19.1111	19.90139	17.20764	19.50625	16.21944	16.4875	18.70833	18.75694	16.35347	18.73264	15.18066	15.41528	17.08194	17.28472	15.29792	16.24861	15.20278	16.7	16.95833	15.20278	16.82917	13.7625	15.20972	12.7	11.8
2019	8	16	15.64806	15.48889	17.07083	17.42361	15.56997	17.24722	16.04722	16.33611	18.09167	18.0125	16.19167	18.05208	15.40556	15.66111	17.55694	17.53333	15.53333	16.50803	15.34722	16.84722	17.05417	15.34722	16.95069	13.71944	15.2	12.7	11.8
2019	8	17	13.38611	13.09167	14.04722	14.70833	13.16389	14.37778	14.22778	14.52083	15.7125	15.675	14.37431	15.68375	14.95604	15.18333	16.6	16.75278	15.07014	15.89167	15.275	16.72361	16.97361	15.275	16.84861	13.71806	15.2	12.7	11.8
2019	8	18	13.46806	13.31667	14.89167	15.27639	13.39236	15.08403	13.94306	14.21111	15.68333	15.65	14.07708	15.66667	14.4	14.65	15.94861	16.10833	14.525	15.29931	14.93611	16.33472	16.62083	14.93611	14.47778	13.70833	15.15	12.7	11.8
2019	8	19	13.74167	13.54722	15.35278	15.89167	13.64444	15.52222	13.82083	14.075	15.65972	15.60972	13.94792	15.63472	14.10139	14.34722	15.67917	15.83611	14.22431	15.01319	14.67361	16.04861	15.32639	14.67361	16.1875	15.62917	15.0584	12.7	11.84444
2019	8	20	14.61806	14.37917	15.62639	16.51667	14.49861	16.07153	14.03194	14.26667	15.76528	15.80139	14.14931	15.78333	13.95556	14.21389	15.53333	15.69167	14.08472	14.87361	14.47222	15.8375	16.14722	14.47222	15.99236	13.53889	14.94722	12.7	11.9
2019	8	21	16.49028	16.175	17.55	18.61389	16.55264	18.08194	15.14306	15.55833	17.05417	17.16111	15.25069	17.10764	14.16944	14.45	15.75278	15.94583	14.32072	15.10139	14.4375	15.75417	16.02778	14.4375	15.89097	13.45556	14.83472	12.7	11.9
2019	8	22	17.02361	16.7875	18.22222	19.21389	16.90556	18.76806	16.1375	16.33278	18.21111	18.2625	16.24514	18.23681	14.65972	14.93889	16.3625	16.57778	14.79931	15.65069	14.60694	15.90833	16.12917	14.60694	16.01875	13.4	14.76028	12.7	11.9
2019	8	23	14.94722	14.73833	16.12361	16.55278	14.85278	16.33819	15.14861	15.37778	16.80278	16.78472	15.26319	16.79375	14.76944	15.04167	16.37222	16.58472	14.90556	15.70094	14.79722	16.09306	16.29167	14.79722	16.19236	13.4	14.7	12.60556	11.9
2019	8	24	15.85694	15.60278	16.94861	17.53333	15.72986	17.24097	15.26111	15.47639	16.95694	16.94861	15.36875	16.95278	14.60833	14.86944	16.17083	16.34444	14.73889	15.52014	14.8	16.0094	16.27361	14.8	16.14028	13.4	14.7	12.6	11.9
2019	8	25	15.00417	14.79028	15.50972	16.51528	14.89722	15.9125	15.07778	15.29028	16.31667	16.375	15.18403	16.34583	14.62083	14.89583	16.07639	16.25417	14.75833	15.48611	14.79167	15.98472	16.20417	14.79167	16.09444	13.4	14.7	12.6	11.9
2019	8	26	14.125	13.93611	14.46111	15.0584	14.03856	14.75903	14.62222	14.83056	15.57917	15.64444	14.72639	15.61381	14.49167	14.725	15.75139	15.92778	14.60833	15.23819	14.7	15.85	16.12639	14.7	15.98819	13.4	14.7	12.6	11.9
2019	8	27	13.7125	13.50833	14.04583	14.61667	13.61042	14.33125	13.975	14.15972	14.76944	14.80694	14.06736	14.78819	14.16528	14.4125	15.2125	15.39444	14.28889	14.8125	14.57361	15.62639	15.92083	14.57361	15.77361	13.4	14.62222	12.6	11.9
2019	8	28	14.49028	14.26944	14.80833	15.4625	14.37986	15.13942	14.44583	14.625	15.35417	15.49417	14.53542	15.40417	14.04444	14.29583	15.10139	15.18611	14.17014	14.69861	14.40556	15.38056	15.6875	14.40556	15.53403	13.375	14.56528	12.6	11.9
2019	8	29	13.35972	13.16528	13.46667	14.14306	13.2625	13.80486	13.80556	13.98333	14.39861	14.48611	13.89444	14.44236	13.93056	14.17361	14.83611	15.02222	14.05208	14.50486	14.35694	15.25972	15.56389	14.35694	15.41181	13.3	14.47778	12.6	11.9
2019	8	30	13.04583	12.92222	13.28889	13.63611	12.98403	13.4625	13.74583	13.8875	14.38333	14.425	13.81667	14.40417	13.72639	14.01528	14.62222	14.83056	13.87083	14.31875	14.19722	15.06111	15.35972	14.19722	15.21042	13.20278	14.39861	12.6	11.9
2019	8	31	12.32639	12.15972	12.79722	13.12083	12.24306	12.95903	12.84167	13.075	13.46944	13.45139	13.00833	13.46042	13.41528	13.64167	14.20278	14.35278	13.52847	13.92222	14.0375	14.85	15.175	14.0375	15.0125	13.19861	14.29306	12.6	11.9
2019	9	1	12.87083	12.66111	13.725	14.08889	12.76997	13.90694	13.0375	13.14028	13.86944	13.86944	13.08889	13.86944	13.15556	13.375	14.00972	14.16111	13.26628	13.69236	13.77917	14.5875	14.94861	13.77917	14.76806	13.10278	14.18056	12.59722	11.9
2019	9	2	14.04167	13.81667	14.71389	15.24861	13.92917	14.98125	13.89583	13.78056	14.69306	14.75833	13.73819	14.72589	13.18333	13.40139	14.20139	14.3625	15.25236	13.80139	13.6	14.5	14.80417	13.6	14.65208	13.00139	14.06111	12.51111	11.9
2019	9	3	14.21111	13.94583	13.86806	14.64306	14.07847	14.25556	13.79444	13.87361	14.30694	14.43056	13.83403	14.36875	13.27361	15.5125	14.25139	14.41528	13.39306	13.88194	13.6	14.5	14.84583	13.6	14.67292	12.94861	13.975	12.5	11.85139
2019	9	4	15.42778	15.12361	15.45972	16.17222	15.27569	15.81597	14.67083	14.75417	15.18333	15.34306	14.71125	15.26319	13.48611	13.72917	14.34028	14.54028	13.60794	14.03472	15.68944	14.5	14.8	15.68944	14.65	12.9	12.9	12.45894	11.8
2019	9	5	14.89861	14.64722	14.55556	15.25417	14.77292	14.90486	14.70556	14.79167	15.06528	15.19167	14.74861	15.12847	13.74861	14.05139	14.59583	14.78333	13.9	14.32361	13.90556	14.575	14.875	13.90556	14.725	12.80417	13.8375	12.4	11.8
2019	9	6	14.29306	14.07639	14.575	15.01667	14.18472	14.79583	14.39444	14.47083	14.76528	14.84444	14.83264	14.80486	13.79583	14.07083	14.47083	14.65833	13.93333	14.27083	14	14.6	14.9	14	14.75	12.80694	13.8	12.4	11.8
2019	9	7	14.95278	14.68333	15.23889	15.84444	14.81806	15.54167	14.51125	14.57361	15.13194	15.23194	14.54306	15.18194	13.73194	14.03194	14.525	14.70417	13.88194	14.27847	14	14.6	14.9	14	14.75	12.89861	13.8	12.4	11.8
2019	9	8	13.62222	13.49306	13.97222	14.31389	13.55764	14.14306	14.48333	14.56111	14.975	15.03056	14.52222	15.00278	13.87778	14.15417	14.71944	14.90139	14.01597	14.43881	14.04028	14.64167	14.96389	14.04028	14.80278	12.9	13.8	12.4	11.8
2019	9	9	12.7125	12.07639	12.7375	13.02778	12.14444	12.86364	13.175	13.22778	13.61806	13.60278	13.20139	13.61042	13.50417	13.73611	14.23889	14.39306	13.62014	13.9875	13.97222	14.57361	14.92917	13.97222	14.75139	12.9	13.8	12.4	11.8
2019	9	10	11.54028	11.38611	12.42778	12.65556	11.46319	12.54167	12.55556	12.60694	13.14583	13.10972	12.58125	13.12778	13.07083	13.27222	13.76806	13.90694	13.17153	13.52014	13.65	14.82361	14.71111	13.65	14.51736	12.85833	13.70833	12.39583	11.76111
2019	9	11	11.61806	11.43472	12.58611	12.84861	11.52639	12.71736	12.23889	12.26944	13.0125	12.99861	12.25417	13.00556	12.69444	12.89306	13.42778	13.54806	12.79375	13.16042	13.375	14.08889	14.49583	13.375	14.29236	12.8	13.6875	12.31944	11.7
2019	9	12	12.06528	11.84167	11.67778	12.26389	11.95347	11.97083	12.2375	12.24028	12.48333	12.54722	12.23889	12.55528	12.45556	12.66667	13.17222	13.33056	12.56111	12.91944	13.13472	13.88889	14.3125	13.13472	14.10069	12.72083	13.59444	12.3	11.7
2019	9	13	13.33333	13.08472	13.17083	13.7625	13.20903	13.46667	13.08194	13.04861	13.22778	13.35139	13.06528	13.28958	12.5	12.74167	13.05278	13.22639	12.62083	12.89722	13	13.67639	14.12083	13	13.89861	12.61389	13.49583	12.3	11.7

2019	9	14	12.82639	12.58194	12.80278	13.27083	12.70417	13.03881	13.07639	13.04861	13.19028	13.27222	13.0625	13.23125	12.65566	12.875	13.17222	13.3625	12.76528	13.02361	13.06944	13.63889	14.08194	13.06944	13.86042	12.55694	13.4	12.28066	11.7
2019	9	15	13.56111	13.27778	13.09028	13.66111	13.41944	13.27665	13.22661	13.18889	13.36111	13.36111	13.20635	13.31111	12.66528	12.89038	13.14806	13.35417	12.77778	13.02917	13.1	13.6	14	13.1	13.8	12.5	13.31667	12.2	11.7
2019	9	16	14.03611	13.7875	13.89861	14.33611	13.91181	14.11736	13.84444	13.81806	13.89722	13.99444	13.83125	13.94583	12.85972	13.0875	13.33472	13.53889	12.97361	13.21111	13.1125	13.6	14	13.1125	13.8	12.42778	13.24028	12.2	11.65139
2019	9	17	13.13056	12.94167	13.28194	13.70417	13.03611	13.49306	13.54306	13.51806	13.72619	13.79722	13.53056	13.76181	12.96389	13.17639	13.45694	13.65139	13.07014	13.31667	13.2	13.67778	14.075	13.2	13.87639	12.4	13.2	12.09861	11.6
2019	9	18	11.51194	11.35	11.14444	11.56389	11.44097	11.35417	12.46389	12.46806	12.26806	12.31667	12.46597	12.29236	12.73889	12.95972	13.14028	13.30278	12.84931	13.05	13.17639	13.64861	14.06389	13.17639	13.85625	12.4	13.2	12.1375	11.6
2019	9	19	11.99306	11.75278	11.02083	11.50278	11.87292	11.26181	12.38889	12.39583	11.96806	12.05417	12.39236	12.01111	12.4375	12.69306	12.68333	12.82083	12.56528	12.68819	13.00972	13.4125	13.84722	13.00972	13.62986	12.4	13.13472	12.1	11.6
2019	9	20	12.71389	12.47778	12.04306	12.47361	12.59583	12.25833	12.77917	12.78611	12.53889	12.43056	12.78264	12.58472	12.4	12.63889	12.47917	12.65833	12.51944	12.55903	12.9	13.21667	13.65278	12.9	13.43472	12.4	13.09367	12.1	11.6
2019	9	21	11.74083	11.51528	10.7875	11.23194	11.63056	11.00972	12.25556	12.29167	11.59444	11.67778	12.27361	11.63611	12.36389	12.58472	12.35139	12.50417	12.47431	12.46806	12.87361	13.07917	13.55417	12.87361	13.31667	12.325	13.00139	12.1	11.6
2019	9	22	13.25238	12.97619	11.28056	11.89444	13.11429	11.5875	12.84286	12.83492	11.82222	11.94583	12.83889	11.88403	12.29206	12.50317	12.19306	12.33889	12.39762	12.34812	12.8	12.94306	13.8056	12.8	13.16181	12.29941	12.91667	12.1	13.54667
2019	9	23	12.83472	12.64028	11.37639	11.82222	12.7375	11.59931	13.13472	13.11806	11.98472	12.1	13.12639	12.04236	12.47222	12.7	12.19306	12.35833	12.58611	12.44653	12.8	12.87083	13.3	12.8	13.08542	12.20278	12.81667	12.0125	11.5
2019	9	24	11.43194	11.26111	10.56667	10.9	11.34653	10.73333	12.28889	12.30556	11.37778	11.45556	12.29722	11.41667	12.38889	12.61111	12.04167	12.16528	12.5	12.32639	12.8	12.77361	13.19444	12.8	12.98403	12.2	12.74444	12	11.5
2019	9	25	11.21806	11.025	10.21667	10.54861	11.12153	10.38264	11.88056	11.89583	11.00278	11.075	11.88819	11.03889	12.10833	12.32222	11.75833	11.91944	12.21528	12.04028	12.69444	12.61528	13.05972	12.69444	12.8375	12.2	12.68611	12	11.5
2019	9	26	10.13056	9.997222	10.04444	10.26806	10.06389	10.15625	11.38611	11.40972	10.81944	10.85972	11.39792	10.83958	11.88333	12.09583	11.56528	11.69722	11.88958	11.83056	12.34167	12.44722	12.89444	12.54367	12.87083	12.16667	12.6	11.95833	13.42639
2019	9	27	8.4375	8.415278	6.670833	6.803778	6.426389	6.736806	9.494444	9.581944	8.85	8.821222	9.538194	8.836111	11.37917	11.58194	11.10278	11.21667	11.48056	11.34236	12.29444	12.24306	12.71806	12.29444	12.48056	12.08611	12.49722	11.9	11.4
2019	9	28	5.002778	4.915278	5.056944	5.295833	4.959028	5.176389	7.548611	7.619445	6.883333	6.875	7.364028	6.879167	10.30972	10.50694	9.872222	9.981944	10.40833	10.18958	11.76944	11.76667	12.275	11.76944	12.02083	11.95278	12.37639	11.9	11.4
2019	9	29	4.454167	4.369444	4.231944	4.516667	4.411806	4.374306	6.775	6.8125	5.916667	5.941667	6.79375	5.929167	9.419444	9.586111	8.9	9.004167	9.502778	9.243056	11.1125	11.13611	11.68333	11.1125	11.40972	11.82917	12.21389	11.88611	11.4
2019	9	30	4.519444	4.413889	4.619444	4.886111	4.466667	4.752778	6.448611	6.468055	5.720833	5.805556	6.408333	5.788194	8.773611	8.965278	8.266667	8.369444	8.869444	8.615972	10.53472	10.54028	11.11389	10.53472	10.82708	11.60417	11.98194	11.8	11.34083
2019	10	1	4.023611	3.8875	3.136111	3.545833	3.955556	3.340972	5.980556	5.965278	4.826389	4.976389	5.972917	4.951389	8.294444	8.484722	7.791667	7.913889	8.389583	8.138194	10.00972	10.05556	10.63889	10.00972	10.34722	11.34167	13.70833	11.71528	11.3
2019	10	2	4.438889	5.234722	4.993056	5.527778	5.336806	5.260417	6.409722	6.338889	5.444444	5.572222	6.374306	5.508333	7.594722	8.158333	7.241667	7.375	8.046528	7.7	9.566667	9.584722	10.1875	9.566667	9.886111	11.08611	11.42917	11.58194	11.25
2019	10	3	5.233333	5.005556	3.668056	4.151389	5.119444	3.909722	6.638889	6.569444	5.318056	5.411111	6.604167	5.364583	7.902778	8.129167	7.330556	7.491667	8.015972	7.729861	9.344444	9.330555	9.888889	9.344444	9.609722	10.82917	11.54444	11.45556	11.2
2019	10	4	6.232333	6.0125	5.043056	5.532333	6.122917	5.288194	6.973611	6.861111	5.520833	5.656944	6.917361	5.588889	7.8	8.061111	7.009722	7.1625	7.930556	7.359417	9.188056	9.086111	9.641667	9.188056	9.363889	10.6	10.89167	11.33056	11.15972
2019	10	5	7.479167	7.209722	6.913889	7.368056	7.344444	7.140972	7.775	7.020833	6.938889	7.063889	7.697917	7.001389	7.952778	8.198611	7.316667	7.505556	8.075694	7.757639	9.1	8.904166	9.5	9.1	9.202083	10.37917	10.86111	11.16528	11.07639
2019	10	6	7.383333	7.143056	5.900944	6.445833	7.263194	6.176389	7.909722	7.802778	6.875	6.808333	7.85625	6.741667	8.152778	8.397222	7.641667	7.830556	8.275	8.019444	9.161111	8.998611	9.5	9.161111	9.249306	10.24861	10.45556	11.05	11
2019	10	7	7.561111	7.341667	6.284722	6.813889	7.451389	6.549306	8.138889	8.040278	8.820833	6.961111	8.089583	8.890972	8.238889	8.490278	7.541667	7.780556	8.945833	8.015972	9.2	8.979167	9.484722	9.2	9.231944	10.13333	10.29722	10.93194	10.92917
2019	10	8	4.770833	4.736111	3.713889	4.105556	4.753472	3.909722	7.151389	7.084722	5.6625	5.7125	7.118056	5.6875	8.195833	8.445833	7.520833	7.7	8.320833	7.983333	9.190278	8.908333	9.4	9.190278	9.154666	10.025	10.16944	10.81944	10.82917
2019	10	9	3.058333	2.961111	1.672222	2.302778	3.009722	1.8875	5.441667	5.366667	3.684722	3.740611	5.404167	3.756667	7.515278	7.738889	6.615278	6.754167	7.627083	7.177083	8.941667	8.65	9.172222	8.941667	8.911111	9.940278	10.05	10.72083	10.77639
2019	10	10	2.219444	2.130556	0.386111	0.681944	2.175	0.534028	4.486111	4.386111	2.383333	2.430556	4.436111	2.406944	6.794444	6.994444	5.661111	5.808333	6.894444	6.327778	8.5	8.147222	8.697222	8.5	8.422222	9.8125	9.8	10.62083	10.675
2019	10	11	2.381944	2.281944	0.129167	0.593056	2.331944	0.361111	4.136111	3.972222	1.834722	1.925	4.054167	1.879861	6.194444	6.423611	4.915278	5.038889	6.309628	5.669444	8.022222	7.547222	8.155556	8.022222	7.851389	9.613889	9.673611	10.53194	10.6
2019	10	12	1.052778	2.905556	0.388889	1.365278	2.979167	0.877083	4.238889	4.051389	1.790278	1.991667	4.145139	1.890972	5.815278	6.076389	4.381944	4.561111	5.948333	5.229167	7.573611	7.0625	7.677778	7.573611	7.370139	9.395833	9.405555	10.41944	10.52778
2019	10	13	4.973611	4.744444	3.251389	3.998611	4.859028	3.625	5.323611	5.147222	3.245833	3.527778	5.235417	3.388889	5.836111	6.125	4.322222	4.554167	5.980556	5.223611	7.323611	6.7375	7.3	7.323611	7.01875	9.175	9.118056	10.28056	10.42917

2019	10	14	5.009722	4.798611	4.069444	4.477778	4.904167	4.273611	5.808333	5.640278	4.405556	4.534722	5.724306	4.470139	6.147222	6.433333	5.011111	5.179167	6.290278	5.722222	7.343056	6.708333	7.2375	7.343056	6.972917	8.972222	8.865278	10.15833	10.36111
2019	10	15	4.655555	4.431944	4.093056	4.386111	4.54375	4.239983	5.501389	5.361111	4.4	4.480556	5.43125	4.440278	6.168055	6.448611	5.254944	5.4	6.308333	5.852778	7.383333	6.8	7.3	7.383333	7.05	8.843055	8.661111	9.969444	10.23833
2019	10	16	4.970833	4.705556	3.852778	4.483333	4.838194	4.188056	5.484722	5.343056	4.355556	4.490278	5.413889	4.422917	6.111111	6.361111	5.313889	5.444444	6.236111	5.8375	7.3	6.8	7.3	7.3	7.05	8.693055	8.520833	9.858333	10.18056
2019	10	17	6.341667	6.068056	5.479167	6.131944	6.204861	5.805556	6.416667	6.322222	5.569444	5.761111	6.369444	5.665278	6.244444	6.511111	5.536111	5.736111	6.377778	6.023611	7.3	6.830556	7.327778	7.3	7.079167	8.6	8.4	9.729167	10.00417
2019	10	18	5.163889	4.970833	3.666667	4.179167	5.067361	3.922917	6.079167	5.954167	4.720833	4.852778	6.016667	4.786056	6.443056	6.695833	5.718056	5.926389	6.569444	6.206944	7.380556	6.9625	7.427778	7.380556	7.195139	8.501389	8.301389	9.630556	9.9
2019	10	19	4.197222	4.011111	2.305556	2.951389	4.104167	2.628472	5.322222	5.219444	3.661111	3.820833	5.270833	3.740972	6.247222	6.488889	5.336111	5.488889	6.368056	5.9125	7.358333	6.870833	7.373611	7.358333	7.122222	8.477778	8.236111	9.519445	9.818056
2019	10	20	4.76389	4.094444	2.7625	3.427778	4.185417	3.095139	5.101389	5.004167	3.644444	3.843056	5.052778	3.74375	5.947222	6.227778	4.961111	5.104167	6.0875	5.594444	7.183333	6.658333	7.168055	7.183333	6.913194	8.395833	8.165278	9.419444	9.704166
2019	10	21	3.058333	2.941667	1.591667	1.523611	3	1.757639	4.444444	4.330556	2.8625	2.948611	4.3875	2.905556	5.718056	5.986111	4.718056	4.893055	5.852083	5.352083	7.031944	6.475	6.988889	7.031944	6.731944	8.3	8.048611	9.354167	9.638889
2019	10	22	2.872222	2.7125	1.869444	2.227778	2.792361	2.048611	3.890278	3.825	2.536111	2.622222	3.857639	2.579167	5.320833	5.55	4.240278	4.401389	5.435417	4.895139	6.794444	6.220833	6.752778	6.794444	6.488056	8.220833	7.936111	9.273611	9.540278
2019	10	23	3.651389	3.4375	2.641667	3.201389	3.544444	2.921528	4.376389	4.269444	3.3375	3.479167	4.322917	3.408333	5.197222	5.4	4.279167	4.415278	5.298611	4.839583	6.558333	5.959722	6.529167	6.558333	6.244444	8.072222	7.770833	9.183333	9.486111
2019	10	24	3.884722	3.645833	3.102778	3.680556	3.765278	3.391667	4.280556	4.197222	3.309722	3.477778	4.238889	3.39375	5.108333	5.345833	4.268056	4.438889	5.227083	4.806945	6.459722	5.879167	6.455556	6.459722	6.167361	7.95	7.6375	9.088889	9.398611
2019	10	25	4.863889	4.6	4.108333	4.581944	4.731944	4.345139	5.145833	5.102778	4.422222	4.565278	5.124306	4.49375	5.25	5.501389	4.677778	4.85	5.375694	5.089583	6.4	5.868056	6.418056	6.4	6.143056	7.831945	7.508333	8.990278	9.3
2019	10	26	2.480556	2.3625	1.383333	1.783333	2.421528	1.583333	4.181944	4.152778	2.888889	3.068056	4.167361	3.028472	5.297222	5.519444	4.670833	4.809722	5.408333	5.095139	6.465278	5.975	6.5	6.465278	6.2375	7.723611	7.4	8.9	9.243056
2019	10	27	1.963889	0.9375	0.076389	0.230556	1.000694	0.133472	1.769444	2.783333	1.577778	1.5875	2.776389	1.582639	4.733333	4.977778	3.901389	4.030556	4.893556	4.439583	6.254167	5.754167	6.318056	6.254167	6.036111	7.841667	7.333333	8.804167	9.154167
2019	10	28	0.730556	0.608333	-0.16389	0.090278	0.669444	-0.03681	2.208333	2.236111	1.080556	1.111111	2.222222	1.095833	4.166667	4.4	3.293056	3.425	4.283333	3.846528	5.809944	5.384722	5.966667	5.809944	5.675694	7.526389	7.220833	8.713889	9.1
2019	10	29	0.204167	0.079167	-1.00139	-0.65	0.141667	-0.82569	1.779167	1.811111	0.722222	0.755556	1.795139	0.738889	3.75	3.966667	2.868056	2.984722	3.858333	3.417361	5.454167	5.052778	5.627778	5.454167	5.540278	7.35	7.055556	8.623611	9.004167
2019	10	30	-0.10417	0.2375	-0.94722	-0.63333	-0.17083	-0.79028	1.368056	1.431944	0.302778	0.340278	1.4	0.321528	3.354167	3.586111	2.523611	2.625	3.470139	3.054861	5.140278	4.738889	5.326389	5.140278	5.032639	7.165278	6.866667	8.529167	8.916666
2019	10	31	0.226389	0.070833	-0.09583	0.229167	0.148611	0.066667	1.3	1.355556	0.897222	0.4375	1.327778	0.417361	3.031944	3.295833	2.233333	2.394444	3.163889	2.764583	4.818889	4.425	5.044444	4.818889	4.734722	6.955556	6.680555	8.429166	8.872222
2019	11	1	0.311111	0.206944	-0.275	0.059722	0.259028	-0.10764	1.395833	1.4	0.5	0.5	1.897917	0.5	2.858333	3.0875	2.118055	2.2625	2.972917	2.602778	4.593055	4.204167	4.823611	4.593055	4.513889	6.784722	6.483333	8.297222	8.781945
2019	11	2	0.540278	0.325	-0.01111	0.366667	0.432639	0.177778	1.4	1.4	0.5	0.555556	1.4	0.527778	2.744444	2.9875	2.044444	2.2	2.865972	2.515972	4.361111	4.058333	4.655555	4.361111	4.356944	6.6	6.302778	8.166667	8.7
2019	11	3	0.770833	0.547222	0	0.323611	0.659028	0.161806	1.518056	1.493056	0.581944	0.6625	1.505556	0.627222	2.7	2.9	2	2.161111	2.8	2.45	4.236111	3.948611	4.536111	4.236111	4.242361	6.434722	6.138889	8.045834	8.627778
2019	11	4	0.65	0.5	-0.01667	0.280556	0.575	0.131944	1.5	1.5	0.897222	0.7	1.5	0.698611	2.631944	2.9	2	2.143056	2.765972	2.45	4.159722	3.859722	4.436111	4.159722	4.147917	6.277778	5.965278	7.909722	8.526389
2019	11	5	0.6	0.438889	-0.02917	0.275	0.519444	0.122917	1.493056	1.5	0.7	0.7	1.496528	0.7	2.6	2.818056	2	2.1	2.709028	2.409028	4.080555	3.786111	4.344445	4.080555	4.065278	6.152778	5.843056	7.784722	8.459722
2019	11	6	0.213889	0.068056	-0.88889	-0.58194	0.140972	-0.73542	1.313889	1.343056	0.484722	0.538889	1.328472	0.511806	2.5	2.751389	1.934444	2.048611	2.625694	2.335417	3.9875	3.7	4.263889	3.9875	3.981944	6.020833	5.758333	7.623611	8.356944
2019	11	7	-0.33611	-0.47778	-1.32778	-1.0125	-0.40694	-1.17014	0.979167	1.016667	0.108333	0.1625	0.997917	0.135417	2.352778	2.593667	1.756944	1.875	2.472222	2.174306	3.869444	3.593055	4.151389	3.869444	3.872222	5.909722	5.579167	7.518056	8.290278
2019	11	8	0.172222	-0.06806	-0.16944	0.150944	0.052083	-0.06625	0.9	0.904167	0.120833	0.165278	0.902083	0.143056	2.168056	2.436111	1.608333	1.736111	2.302083	2.022222	3.741667	3.458333	4.004167	3.741667	3.73125	5.7375	5.461111	7.394445	8.188889
2019	11	9	0.3	0.061111	0	0.3	0.180556	0.15	0.969444	1	0.219444	0.254167	0.864722	0.238066	2.1	2.354167	1.6	1.7	2.227083	1.977083	3.618055	3.309722	3.891667	3.618055	3.600694	5.627778	5.3375	7.281945	8.1
2019	11	10	0.3	0.181944	0	0.291667	0.240972	0.145833	1.008333	1.026389	0.322222	0.372222	1.017361	0.347222	2.005556	2.3	1.6	1.7	2.152778	1.95	3.518056	3.2	3.8	3.518056	3.5	5.505556	5.236111	7.183333	8.019445
2019	11	11	0.376389	0.2	-0.06389	-0.10833	0.288194	-0.08611	1.1	1.1	0.4	0.372222	1.1	0.086111	2	2.3	1.6	1.7	2.15	1.95	3.497222	3.159722	3.75	3.497222	3.454861	5.391667	5.118055	7.075	7.922222
2019	11	12	0.3	0.198611	-0.13194	0.016667	0.249306	-0.05764	1.040278	1.1	0.306944	0.3	1.070139	0.303472	2	2.297222	1.6	1.688889	2.148611	1.948611	3.398611	3.1	3.7	3.398611	3.4	5.279167	5.015278	6.9625	7.861111

2019	11	13	0.38889	0.2	-0.00833	0.208333	0.294444	0.1	1.084722	1.1	0.390278	0.309722	1.092361	0.95	1.975	2.209722	1.536111	1.601389	2.092361	1.872917	3.316667	3.059722	3.640278	3.316667	3.35	5.2	4.927778	6.881945	7.766667
2019	11	14	0.436111	0.2	-0.03889	0.243056	0.318056	0.102083	1.1	1.1	0.401389	0.4	1.1	0.400694	1.9	2.2	1.5	1.6	2.05	1.85	3.363889	3	3.6	3.363889	3.3	5.108333	4.847222	6.798611	7.604367
2019	11	15	0.5	0.2125	0	0.3	0.35625	0.15	1.098611	1.1	0.497222	0.472222	1.099306	0.484722	1.9	2.100944	1.5	1.6	2.003472	1.803472	3.2	2.990278	3.5625	3.2	3.276389	5.068055	4.772222	6.702778	7.5825
2019	11	16	0.5	0.269444	0	0.3	0.384722	0.15	1.051389	1.1	0.5	0.5	1.075694	0.5	1.9	2.1	1.5	1.6	2	1.8	3.2	2.9	3.5	3.2	3.2	4.977778	4.7	6.6125	7.458333
2019	11	17	0.5	0.295833	0	0.3	0.397917	0.15	1.002778	1.1	0.5	0.5	1.051389	0.5	1.893056	2.1	1.5	1.6	1.996528	1.8	3.102778	2.9	3.5	3.102778	3.2	4.9	4.611111	6.544444	7.4
2019	11	18	0.5	0.3	0.059722	0.3	0.4	0.179861	1	1.1	0.5	0.5	1.05	0.5	1.813889	2.1	1.5	1.6	1.956944	1.8	3.1	2.9	3.436111	3.1	3.180056	4.855556	4.575	6.4625	7.315278
2019	11	19	0.5	0.3	0.1	0.3	0.4	0.2	1	1.1	0.5	0.55	1.05	0.525	1.8	2.091667	1.5	1.6	1.945833	1.795833	3.091667	2.813889	3.4	3.091667	3.106944	4.793056	4.5	6.4	7.230055
2019	11	20	0.5	0.3	0.1	0.290278	0.4	0.195139	1	1.1	0.5	0.6	1.05	0.55	1.8	2.022222	1.5	1.6	1.911111	1.761111	3	2.8	3.4	3	3.1	4.7	4.429367	6.809722	7.186111
2019	11	21	0.5	0.294444	0.025	0.100944	0.397222	0.065972	1	1.1	0.5	0.509722	1.05	0.504861	1.8	2	1.5	1.6	1.9	1.75	3	2.8	3.365278	3	3.082639	4.691666	4.397222	6.240833	7.1
2019	11	22	0.5	0.211111	-0.06667	0.018056	0.355556	-0.02431	1	1.03889	0.43889	0.429367	1.019444	0.434028	1.78889	2	1.413889	1.55	1.894444	1.705944	2.994444	2.784722	3.3	2.994444	3.042361	4.601389	4.3	6.183333	7.027778
2019	11	23	0.5	0.252778	0	0.236111	0.376389	0.118056	1	1	0.4375	0.425	1	0.43125	1.701389	1.95	1.4	1.5	1.825694	1.675	2.9	2.7	3.3	2.9	3	4.558333	4.268056	6.1	7
2019	11	24	0.5	0.288889	0	0.3	0.394444	0.15	0.933333	1	0.5	0.494444	0.966667	0.497222	1.7	1.9	1.4	1.5	1.8	1.65	2.9	2.7	3.225	2.9	2.9625	4.498611	4.2	6.055556	6.9
2019	11	25	0.498611	0.255556	-0.02222	-0.02222	0.377083	-0.02222	0.9	1	0.484722	0.484722	0.95	0.484722	1.7	1.9	1.4	1.5	1.8	1.65	2.9	2.695833	3.2	2.9	2.947917	4.454367	4.15	5.933333	6.855556
2019	11	26	0.363889	0.100944	-0.33889	-0.86389	0.185417	-0.70139	0.872222	0.9625	0.340378	0.233333	0.917361	0.236806	1.647222	1.891667	1.3375	1.434722	1.769444	1.614583	2.820833	2.6	3.1875	2.820833	2.89375	4.372222	4.1	5.9	6.8
2019	11	27	-0.5125	-0.575	-1.71528	-2.17917	-0.54375	-1.94722	0.7	0.815278	-0.10139	-0.26111	0.757639	-0.18125	1.583333	1.8	1.166667	1.333333	1.691667	1.483333	2.8	2.588889	3.1	2.8	2.844444	4.305556	4.073611	5.834722	6.738889
2019	11	28	-1.1375	-1.17778	-2.19444	-2.44444	-1.15764	-2.31944	0.411111	0.565278	-0.6	-0.96944	0.488194	-0.78472	1.455556	1.679167	1.013889	1.133333	1.567361	1.346528	2.718056	2.476389	3.043056	2.718056	2.759722	4.234722	4	5.769445	6.7
2019	11	29	-1.29444	-1.35139	-2.24028	-2.31806	-1.32292	-2.27917	0.251389	0.370833	-0.76528	-1.1125	0.311111	-0.93889	1.320833	1.544444	0.873611	0.969444	1.42639	1.209028	2.625	2.373611	2.940278	2.625	2.656945	4.2	1.944444	5.7	6.6125
2019	11	30	-1.65972	-1.72917	-2.86389	-2.95417	-1.69444	-2.90903	0.140278	0.204167	-1.05894	-1.39861	0.172222	-1.22778	1.166667	1.429167	0.780556	0.883333	1.297917	1.104861	2.515278	2.222222	2.829167	2.515278	2.525694	4.141667	3.883333	5.659722	6.6
2019	12	1	-2.71806	-2.74306	-4.40833	-4.58472	-2.73056	-4.49653	-0.14028	-0.07083	-1.88056	-2.35417	-0.10206	-2.11736	1.047222	1.305556	0.695833	0.768056	1.176389	1.000694	2.405556	2.134722	2.734722	2.405556	2.434722	4.054367	3.8	5.6	6.526389
2019	12	2	-2.27639	-2.37639	-3.57083	-3.45556	-2.32639	-3.51319	-0.51806	-0.39444	-1.94444	-2.2375	-0.45625	-2.00597	0.918056	1.158333	0.581944	0.652778	1.038194	0.870139	2.245833	2.033333	2.654167	2.245833	2.34375	4	3.725	5.523611	6.486889
2019	12	3	-1.27917	-1.43889	-2.10417	-1.84444	-1.35903	-1.97431	-0.3875	-0.26944	-1.23333	-1.31867	-0.32847	-1.275	0.8	1.043056	0.5	0.555556	0.921528	0.771528	2.1375	1.936111	2.558333	2.1375	2.247222	3.918056	3.6625	5.5	6.4
2019	12	4	-0.88889	-1.05278	-1.52778	-1.25139	-0.97083	-1.38958	-0.27222	-0.15694	-0.90139	-0.95278	-0.21468	-0.92708	0.716667	0.984722	0.465278	0.5	0.850694	0.725	2.061111	1.888889	2.479167	2.061111	2.184028	3.831944	3.581944	5.405556	6.395833
2019	12	5	-1.0875	-1.21111	-1.88889	-1.57639	-1.14931	-1.73264	-0.23889	-0.12778	-0.89861	-0.97361	-0.18333	-0.93611	0.7	0.9	0.320833	0.5	0.8	0.610417	2	1.8	2.4	2	2.1	3.8	3.5	5.354167	6.3
2019	12	6	-1.84583	-1.95278	-2.87361	-2.62361	-1.89931	-2.74861	-0.53333	-0.39583	-1.47361	-1.60417	-0.46458	-1.53889	0.681944	0.9	0.3	0.480556	0.790722	0.6	1.966667	1.8	2.361111	1.966667	2.080556	3.711111	1.458333	5.280556	6.279167
2019	12	7	-1.65694	-1.77778	-2.47917	-2.23472	-1.71736	-2.35694	-0.63472	-0.53611	-1.45972	-1.55972	-0.58542	-1.50972	0.6	0.840278	0.254167	0.358333	0.720139	0.547222	1.9	1.708333	2.3	1.9	2.004167	3.627778	3.4	5.2	6.2
2019	12	8	-1.87778	-1.97917	-2.82917	-2.62639	-1.92847	-2.72778	-0.67917	-0.56111	-1.55972	-1.71389	-0.62034	-1.63681	0.586111	0.8	0.2	0.3	0.693056	0.5	1.85	1.7	2.223611	1.85	1.961806	3.568055	3.320833	5.190278	6.194444
2019	12	9	-2.03667	-2.10139	-2.95556	-2.775	-2.05903	-2.86528	-0.80972	-0.63472	-1.71944	-1.86944	-0.72222	-1.79444	0.5	0.744444	0.177778	0.215278	0.622222	0.461111	1.8	1.609722	2.2	1.8	1.904861	3.5	3.297222	5.1	6.1
2019	12	10	-2.02222	-2.14444	-2.89306	-2.72222	-2.08333	-2.80764	-0.875	-0.7	-1.80278	-1.91806	-0.7875	-1.80642	0.5	0.7	0.1	0.15	0.6	0.4	1.783333	1.579167	2.125	1.783333	1.852083	3.480556	3.2	5.083333	6.070833
2019	12	11	-2.11967	-2.23333	-2.98056	-2.83972	-2.175	-2.82054	-0.9	-0.775	-1.92917	-2.04306	-0.8375	-1.98611	0.436111	0.6625	0.011111	0.080556	0.549306	0.338006	1.7	1.5	2.1	1.7	1.8	3.4	1.154167	5	5.9375
2019	12	12	-1.72083	-1.87639	-2.34444	-2.18889	-1.79861	-2.26667	-0.84722	-0.67361	-1.61867	-1.72083	-0.76042	-1.66875	0.393056	0.6	0	0	0.496528	0.3	1.672222	1.465278	2.0125	1.672222	1.738889	3.398611	3.1	4.947222	5.9

2019	12	13	-1.80694	-1.94861	-2.31389	-2.21389	-1.87778	-2.26389	-0.84583	-0.65833	-1.56111	-1.63472	-0.75208	-1.59792	0.302778	0.6	-0.04167	0	0.451289	0.279167	1.6	1.4	2	1.6	1.7	3.3125	3.01389	4.9	5.8875
2019	12	14	-1.78856	-1.93194	-2.23333	-2.15	-1.85635	-2.19167	-0.88611	-0.7	-1.57083	-1.65129	-0.79306	-1.61111	0.3	0.541667	-0.1	-0.09056	0.420833	0.320833	1.6	1.381944	1.9375	1.6	1.699722	3.199722	1.984722	4.85	5.8
2019	12	15	-1.535	-1.67361	-2.10694	-1.92083	-1.59931	-2.01389	-0.79583	-0.60278	-1.4375	-1.5	-0.69981	-1.46875	0.297722	0.5	-0.1	-0.09167	0.398611	0.2	1.544444	1.301389	1.9	1.544444	1.600694	3.163889	2.8	4.8	5.743056
2019	12	16	-1.34167	-1.48056	-1.9875	-1.775	-1.41111	-1.88125	-0.7	-0.50833	-1.36944	-1.4	-0.60417	-1.38472	0.206944	0.5	-0.1	-0.01111	0.353472	0.2	1.5	1.2625	1.898611	1.5	1.580556	3.101389	2.893056	4.718055	5.7
2019	12	17	-1.20506	-1.34444	-1.75556	-1.49861	-1.275	-1.62708	-0.62222	-0.46528	-1.25139	-1.25417	-0.54375	-1.25278	0.2	0.5	-0.1	0	0.35	0.2	1.5	1.2	1.802778	1.5	1.501389	3.095833	2.8	4.7	5.680555
2019	12	18	-1.15417	-1.30972	-1.79306	-1.54167	-1.23194	-1.66736	-0.6	-0.33472	-1.17917	-1.18889	-0.46736	-1.18403	0.2	0.5	-0.1	0	0.35	0.2	1.458333	1.2	1.8	1.458333	1.5	3.004167	2.8	4.618055	5.6
2019	12	19	-1.25861	-1.44167	-1.91389	-1.675	-1.37014	-1.79444	-0.62639	-0.47917	-1.27778	-1.31528	-0.55278	-1.29655	0.2	0.443056	-0.1	0	0.521528	0.171528	1.4	1.2	1.8	1.4	1.5	2.997222	2.758444	4.6	5.581944
2019	12	20	-1.38472	-1.54444	-1.97639	-1.76028	-1.46458	-1.85833	-0.67083	-0.5	-1.29306	-1.34444	-0.98542	-1.18175	0.2	0.4	-0.1	-0.00139	0.3	0.15	1.361111	1.190278	1.8	1.361111	1.495139	2.901389	2.7	4.5125	5.5
2019	12	21	-1.52639	-1.70139	-2.05694	-1.83889	-1.61389	-1.94792	-0.77083	-0.59028	-1.41806	-1.44028	-0.88056	-1.42917	0.2	0.4	-0.1	-0.09583	0.3	0.15	1.3	1.1	1.734722	1.3	1.417361	2.9	2.686111	4.401389	5.5
2019	12	22	-1.23889	-1.38472	-1.68333	-1.48611	-1.31181	-1.58472	-0.6375	-0.50278	-1.1875	-1.20278	-0.57014	-1.19514	0.129167	0.4	-0.1	-0.05417	0.264583	0.15	1.3	1.1	1.7	1.3	1.4	2.9	2.6	4.373611	5.411111
2019	12	23	-1.42222	-1.57917	-1.88472	-1.69306	-1.50069	-1.78889	-0.73889	-0.59972	-1.31806	-1.33194	-0.64981	-1.325	0.1	0.3375	-0.1	-0.08889	0.21875	0.11875	1.3	1.1	1.7	1.3	1.4	2.833333	2.6	4.3	5.4
2019	12	24	-1.58889	-1.75139	-2.11944	-2.00278	-1.67014	-2.06111	-0.78028	-0.60556	-1.4125	-1.47778	-0.69792	-1.44514	0.1	0.3	-0.13333	-0.1	0.2	0.083333	1.270833	1.1	1.7	1.270833	1.4	2.8	2.579367	4.3	5.35
2019	12	25	-1.40094	-1.56944	-1.89444	-1.71667	-1.48819	-1.80556	-0.75694	-0.60833	-1.34167	-1.36806	-0.68264	-1.35486	0.1	0.3	-0.2	-0.1	0.2	0.05	1.2	1.1	1.7	1.2	1.4	2.7625	2.5	4.213889	5.3
2019	12	26	-1.98856	-2.13333	-2.67361	-2.61667	-2.05694	-2.64514	-0.9375	-0.7625	-1.71111	-1.81111	-0.85	-1.76111	0.1	0.3	-0.2	-0.1	0.2	0.05	1.2	1.016667	1.679167	1.2	1.347917	2.7	3.5	4.2	5.3
2019	12	27	-2.31111	-2.46389	-3.02778	-2.92639	-2.3875	-2.97708	-1.23472	-0.97778	-2.05417	-2.16806	-1.10625	-2.11111	0.098611	0.3	-0.2	-0.18611	0.199306	0.05	1.2	1	1.6	1.2	1.3	2.7	2.5	4.183333	5.234722
2019	12	28	-2.25833	-2.40972	-2.99861	-2.90417	-2.33403	-2.95139	-1.25	-1.02917	-2.07222	-2.18056	-1.13958	-2.12639	0.004167	0.258333	-0.23472	-0.2	0.13125	0.011806	1.2	1	1.6	1.2	1.3	2.7	2.408333	4.1	5.2
2019	12	29	-1.99861	-2.15	-2.64861	-2.44306	-2.07431	-2.54083	-1.18889	-0.94861	-1.91944	-1.96111	-1.06875	-1.94028	0	0.2	-0.3	-0.2	0.1	-0.05	1.108333	1	1.6	1.108333	1.3	2.6375	2.4	4.1	5.180555
2019	12	30	-2.20506	-2.37639	-2.9125	-2.8	-2.29097	-2.85625	-1.22917	-0.99583	-2.025	-2.09861	-1.1125	-2.06181	0	0.2	-0.3	-0.23056	0.1	-0.05	1.1	0.977778	1.575	1.1	1.276389	2.6	2.4	4.019444	5.1
2019	12	31	-1.76383	-1.90417	-2.30506	-1.99583	-1.825	-2.15069	-1.18056	-0.91111	-1.75833	-1.76806	-1.02083	-1.76319	-0.04583	0.2	-0.3	-0.27639	0.077083	-0.05	1.1	0.9	1.5	1.1	1.2	2.594444	2.340278	4	5.1
2020	1	1	-1.45	-1.58056	-2.075	-1.82639	-1.51528	-1.95069	-0.84444	-0.7	-1.4375	-1.45	-0.77222	-1.44375	-0.1	0.155556	-0.3	-0.2	0.027778	0.07222	1.1	0.9	1.5	1.1	1.2	2.505556	2.3	4	5.054167
2020	1	2	-1.48194	-1.63472	-2.07778	-1.81806	-1.53883	-1.94792	-0.87639	-0.71111	-1.50556	-1.51389	-0.79375	-1.50972	-0.1	0.111111	-0.3	-0.2	0.005556	-0.09444	1.051389	0.9	1.5	1.051389	1.2	2.5	2.3	3.909722	5
2020	1	3	-1.97917	-1.51667	-1.98333	-1.77778	-1.44792	-1.88056	-0.8	-0.61528	-1.42083	-1.43889	-0.70764	-1.42986	-0.1	0.1	-0.3	-0.2	0	-0.1	1	0.9	1.486111	1	1.193056	2.5	2.280556	3.9	5
2020	1	4	-1.32361	-1.49028	-1.86806	-1.62917	-1.40694	-1.74861	-0.79722	-0.6	-1.37917	-1.37917	-0.69861	-1.37917	-0.1	0.1	-0.3	-0.2	0	-0.1	1	0.9	1.4	1	1.15	2.5	2.2	3.851389	4.954944
2020	1	5	-1.63889	-1.78333	-2.46944	-2.20417	-1.71111	-2.33681	-0.85556	-0.69861	-1.55833	-1.63889	-0.77708	-1.59861	-0.1	0.1	-0.30139	-0.20417	0	-0.10069	1	0.8625	1.4	1	1.13125	2.413889	2.2	3.8	4.9
2020	1	6	-1.76806	-1.90972	-2.65278	-2.39444	-1.83889	-2.52361	-0.96944	-0.81528	-1.73889	-1.79861	-0.89236	-1.76875	-0.1	0.1	-0.41806	-0.3	0	-0.15903	1	0.8	1.4	1	1.1	2.4	2.2	3.8	4.9
2020	1	7	-2.45378	-2.58889	-3.51111	-3.3125	-2.52083	-3.41181	-1.34861	-1.15139	-2.29583	-2.43194	-1.25	-2.36389	-0.1375	0.086111	-0.50417	-0.36944	-0.02569	-0.20903	1	0.8	1.4	1	1.1	2.390278	2.111111	3.770833	4.895833
2020	1	8	-2.31806	-2.48056	-3.19861	-2.99722	-2.39931	-3.09792	-1.46667	-1.27083	-2.30556	-2.40556	-1.36875	-2.35556	-0.2	0	-0.6	-0.5	-0.1	-0.3	0.943056	0.8	1.358333	0.943056	1.079167	2.3125	2.1	3.7	4.8
2020	1	9	-2.2	-2.38472	-2.88333	-2.71111	-2.29236	-2.79722	-1.4	-1.2	-2.1	-2.18333	-1.3	-2.14167	-0.2	0	-0.6	-0.5	-0.1	-0.3	0.9	0.8	1.3	0.9	1.05	2.3	2.1	3.7	4.8
2020	1	10	-2.46389	-2.60417	-3.11111	-3.12639	-2.51403	-3.11875	-1.4625	-1.26528	-2.23611	-2.40972	-1.36389	-2.32292	-0.2	-0.00278	-0.62361	-0.50139	-0.10139	-0.31319	0.9	0.727778	1.3	0.9	1.013889	2.294444	2.018056	3.645833	4.768056
2020	1	11	-2.42778	-2.56111	-2.97778	-2.88889	-2.49444	-2.93333	-1.5	-1.3	-2.25	-2.36111	-1.4	-2.30556	-0.26944	-0.09444	-0.7	-0.59861	-0.18194	0.39722	0.9	0.7	1.3	0.9	1	2.269444	2	3.6	4.7

2020	1	12	-2.36806	-2.52917	-3.14861	-3.10556	-2.44861	-3.12708	-1.5	-1.3	-2.28194	-2.425	-1.4	-2.35347	-0.3	-0.1	-0.7	-0.6	-0.2	-0.4	0.9	0.7	1.218056	0.9	0.959028	2.216667	2	3.6	4.7	
2020	1	13	-2.57639	-2.69167	-3.39444	-3.45378	-2.63403	-3.42361	-1.58611	-1.3875	-2.58611	-2.70972	-1.48861	-2.64792	-0.3	-0.1	-0.77917	-0.67222	-0.2	-0.49558	0.811111	0.677778	1.2	0.811111	0.938889	2.2	1.934722	3.519444	4.681944	
2020	1	14	-2.94444	-3.07639	-3.83333	-4.40556	-3.01042	-4.11944	-1.75278	-1.53889	-2.88333	-1.27778	-1.64583	-3.08556	-0.35972	-0.19187	-0.84306	-0.74861	-0.27569	-0.51736	0.8	0.6	1.2	0.8	0.9	2.15	1.9	3.5	4.6	
2020	1	15	-3.48889	-3.61944	-4.54306	-5.37778	-3.55417	-4.96042	-2.12222	-1.89583	-3.52083	-4.06528	-2.00903	-3.79306	-0.46389	-0.24306	-1.01667	-0.97083	-0.35347	-0.62986	0.8	0.6	1.152778	0.8	0.876389	2.101389	1.9	3.5	4.6	
2020	1	16	-3.70278	-3.82083	-4.62361	-5.02639	-3.76181	-4.825	-2.38194	-2.16528	-3.71528	-4.08611	-2.27361	-3.90069	-0.55972	-0.35417	-1.27361	-1.21889	-0.45694	-0.81389	0.790278	0.55	1.1	0.790278	0.825	2.1	1.855556	3.486111	4.6	
2020	1	17	-3.3	-3.42361	-4.02917	-4.0125	-3.36181	-4.02083	-2.2625	-2.04583	-3.26111	-3.4125	-2.15417	-3.33681	-0.6	-0.40972	-1.34028	-1.28333	-0.50486	-0.875	0.7	0.5	1.044444	0.7	0.772222	2.038889	1.8	3.4	4.534722	
2020	1	18	-3.08056	-3.225	-3.91944	-3.91667	-3.15278	-3.91806	-2.10417	-1.9	-3.04167	-3.22222	-2.00208	-3.13194	-0.68333	-0.48333	-1.3	-1.2	-0.58333	-0.89167	0.7	0.4125	1	0.7	0.70625	2	1.8	3.4	4.460278	
2020	1	19	-3.08333	-3.21389	-3.81528	-3.80139	-3.14861	-3.80833	-2.1	-1.9	-3.02222	-3.20278	-2	-3.1125	-0.7	-0.5	-1.35972	-1.29583	-0.6	-0.92986	0.7	0.3	0.916667	0.7	0.608333	2	1.741667	3.4	4.4	
2020	1	20	-2.82083	-2.9625	-3.40972	-3.28889	-2.89167	-3.34931	-2.02361	-1.78333	-2.79722	-2.89167	-1.90347	-2.84444	-0.7	-0.5	-1.32361	-1.23472	-0.6	-0.91181	0.641667	0.3	0.9	0.641667	0.6	2	1.7	3.323611	4.4	
2020	1	21	-2.48194	-2.59722	-2.98472	-2.86111	-2.53958	-2.92292	-1.77917	-1.56667	-2.48889	-2.54583	-1.67292	-2.51736	-0.7	-0.5	-1.25417	-1.14444	-0.6	-0.87708	0.6	0.233333	0.890278	0.6	0.561806	1.947222	1.690278	3.266667	4.394445	
2020	1	22	-2.09306	-2.25	-2.61667	-2.37361	-2.17153	-2.49514	-1.59583	-1.4	-2.19306	-2.21111	-1.49792	-2.20208	-0.7	-0.45139	-1.175	-1.03194	-0.57569	-0.81139	0.6	0.2	0.8	0.6	0.5	1.9	1.6	3.2	4.3	
2020	1	23	-1.66944	-1.83611	-2.1875	-1.97917	-1.75278	-2.08333	-1.31528	-1.08056	-1.86111	-1.84167	-1.19792	-1.85139	-0.62361	-0.36667	-0.975	-0.89306	-0.49514	-0.67083	0.6	0.2	0.8	0.6	0.5	1.9	1.6	3.2	4.3	
2020	1	24	-1.55972	-1.72083	-2.03889	-1.77917	-1.64028	-1.90903	-1.14444	-0.94028	-1.66389	-1.65972	-1.04236	-1.66181	-0.6	-0.3	-0.9	-0.8	-0.45	-0.6	0.998611	0.2	0.8	0.998611	0.5	1.819444	1.597222	3.119444	4.295834	
2020	1	25	-1.425	-1.6	-1.90833	-1.60278	-1.5125	-1.75556	-1.02639	-0.87222	-1.54722	-1.53194	-0.94931	-1.53958	-0.575	-0.3	-0.8375	-0.70833	-0.4375	-0.56875	0.581482	0.2	0.8	0.581482	0.5	1.8	1.501389	3.1	4.2	
2020	1	26	-1.44583	-1.59333	-1.65139	-1.44583	-1.79236	-1	-1.5	-1.5	-1	-1.5	-0.5	-0.5	-0.5	-0.8	-0.7	-0.5	-0.8	0.2	0.8	0.8	0.5	1.8	1.5	1.5	1.5	4.2	4.2	
2020	1	27	-1.375	-1.76944	-1.49306	-1.375	-1.63125	-0.96806	-1.46111	-1.44028	-0.96806	-1.45069	-0.5	-0.8	-0.69861	-0.5	-0.8	-0.69861	-0.5	-0.8	0.2	0.8	0.8	0.5	1.8	1.5	1.5	1.5	4.2	4.2
2020	1	28	-1.23194	-1.6	-1.37222	-1.23194	-1.48611	-0.9	-1.31806	-1.3	-0.9	-1.30903	-0.5	-0.9	-0.73472	-0.60417	-0.5	-0.73472	-0.5	-0.73472	0.2	0.8	0.8	0.5	1.720833	1.5	1.5	1.5	4.115278	4.115278
2020	1	29	-1.39028	-1.7875	-1.60972	-1.39028	-1.69861	-0.90417	-1.41111	-1.41806	-0.90417	-1.41458	-0.5	-0.9	-0.7	-0.6	-0.5	-0.7	-0.5	-0.7	0.2	0.8	0.8	0.5	1.7	1.443056	1.5	1.5	4.1	4.1
2020	1	30	-1.32639	-1.63833	-1.44167	-1.32639	-1.55	-0.91528	-1.43667	-1.38611	-0.91528	-1.40139	-0.5	-0.9	-0.7	-0.6	-0.5	-0.7	-0.5	-0.7	0.2	0.8	0.8	0.5	1.7	1.4	1.4	1.4	4.1	4.1
2020	1	31	-1.19167	-1.5875	-1.37222	-1.19167	-1.47986	-0.84306	-1.325	-1.28889	-0.84306	-1.30894	-0.5	-0.9	-0.7	-0.6	-0.5	-0.7	-0.5	-0.7	0.2	0.8	0.8	0.5	1.7	1.4	1.4	1.4	4.083333	4.083333
2020	2	1	-0.93194	-1.11944	-0.9	-0.93194	-1.00972	-0.74722	-1.14167	-1.07222	-0.74722	-1.10694	-0.5	-0.9	-0.7	-0.6	-0.5	-0.7	-0.5	-0.7	0.2	0.8	0.8	0.5	1.7	1.4	1.4	1.4	4	4
2020	2	2	-0.8	-1.02917	-0.72778	-0.8	-0.87947	-0.60833	-0.85278	-0.77083	-0.60833	-0.81181	-0.49167	-0.60556	-0.46667	-0.49167	-0.60556	-0.49167	-0.60556	-0.49167	0.2	0.8	0.8	0.5	1.7	1.4	1.4	1.4	4	4
2020	2	3	-0.875	-1.5625	-1.43889	-0.875	-1.50069	-0.6	-1.13194	-1.15694	-0.6	-1.14444	-0.41667	-0.6	-0.43611	-0.41667	-0.6	-0.43611	-0.41667	-0.6	0.2	0.8	0.8	0.5	1.616667	1.4	1.4	1.4	4	4
2020	2	4		-2.15278	-2.16944		-2.16111		-1.57778	-1.70278		-1.64028		-0.67083	-0.54722		-0.67083	-0.54722		-0.67083	0.2	0.8	0.8	0.5		1.4	1.4	1.4	4	4
2020	2	5		-2.02361	-1.78889		-1.90625		-1.62917	-1.64444		-1.63681		-0.79722	-0.6875		-0.79722	-0.6875		-0.79722	0.2	0.8	0.8	0.5		1.336111	1.336111	1.336111	3.901389	3.901389
2020	2	6		-1.56528	-1.30139		-1.43333		-1.37917	-1.32917		-1.35417		-0.77917	-0.65417		-0.77917	-0.65417		-0.77917	0.2	0.8	0.8	0.5		1.3	1.3	1.3	3.9	3.9
2020	2	7		-1.29167	-0.95556		-1.12361		-1.1806	-1.07361		-1.09583		-0.7	-0.55139		-0.7	-0.55139		-0.7	0.2	0.8	0.8	0.5		1.3	1.3	1.3	3.9	3.9
2020	2	8		-1.30278	-1.09028		-1.19633		-1.03194	-1.05278		-1.04236		-0.60556	-0.5		-0.60556	-0.5		-0.60556	0.2	0.8	0.8	0.5		1.3	1.3	1.3	3.861111	3.861111
2020	2	9		-1.49583	-1.35139		-1.42361		-1.17917	-1.18333		-1.18125		-0.6	-0.5		-0.6	-0.5		-0.6	0.2	0.8	0.8	0.5		1.3	1.3	1.3	3.8	3.8
2020	2	10		-1.39722	-1.12778		-1.2625		-1.16628	-1.12361		-1.14444		-0.6	-0.5		-0.6	-0.5		-0.6	0.2	0.8	0.8	0.5		1.3	1.3	1.3	3.8	3.8

2020	2	11			-1.2625	-0.94583		-1.10417			-1.01944	-0.99028		-1.00486		-0.6	-0.5		-0.6		0.2	0.8		0.5		1.3		3.8
2020	2	12			-1.17083	-0.89167		-1.03125			-0.90833	-0.9		-0.90417		-0.6	-0.43639		-0.6		0.2	0.8		0.5		1.3		3.773611
2020	2	13			-1.41528	-1.16389		-1.28958			-1.04861	-1.04722		-1.04792		-0.6	-0.40139		-0.6		0.2	0.8		0.5		1.3		3.7
2020	2	14			-1.4	-1.10417		-1.25208			-1.1	-1.00944		-1.08472		-0.6	-0.49722		-0.6		0.2	0.8		0.5		1.244444		3.7
2020	2	15			-1.43889	-1.15972		-1.29931			-1.11111	-1.07778		-1.09444		-0.6	-0.5		-0.6		0.2	0.8		0.5		1.2		3.7
2020	2	16			-1.47917	-1.2		-1.33958			-1.2	-1.1		-1.15		-0.6	-0.5		-0.6		0.2	0.8		0.5		1.2		3.7
2020	2	17			-1.4	-1.22083		-1.31042			-1.13194	-1.10094		-1.11944		-0.6	-0.5		-0.6		0.2	0.8		0.5		1.2		3.677778
2020	2	18			-1.59861	-1.64028		-1.61944			-1.30417	-1.39167		-1.34792		-0.60972	-0.5		0.60972		0.2	0.8		0.5		1.2		3.6
2020	2	19			-1.94861	-1.9		-1.92431			-1.50872	-1.3875		-1.54861		-0.7	-0.57222		-0.7		0.2	0.8		0.5		1.2		3.6
2020	2	20			-2	-1.77083		-1.88542			-1.6	-1.59306		-1.59833		-0.76944	-0.61944		-0.76944		0.2	0.8		0.5		1.2		3.6
2020	2	21			-1.87361	-1.59028		-1.73194			-1.49167	-1.45972		-1.47569		-0.8	-0.6875		-0.8		0.2	0.743056		0.471528		1.2		3.6
2020	2	22			-1.60417	-1.35556		-1.47986			-1.35872	-1.31389		-1.33881		-0.75833	-0.6		-0.75833		0.2	0.7		0.45		1.2		3.6
2020	2	23			-1.48194	-1.27083		-1.37639			-1.22083	-1.2		-1.21042		-0.7	-0.58611		-0.7		0.2	0.7		0.45		1.2		3.543056
2020	2	24			-1.57361	-1.49861		-1.53611			-1.30872	-1.34722		-1.32847		-0.7	-0.54028		-0.7		0.2	0.7		0.45		1.2		3.5
2020	2	25			-1.85139	-1.89444		-1.87292			-1.4875	-1.57778		-1.53264		-0.7125	-0.6		-0.7125		0.2	0.7		0.45		1.165278		3.5
2020	2	26			-1.88194	-1.66389		-1.77292			-1.54628	-1.53472		-1.5375		-0.8	-0.69444		-0.8		0.2	0.7		0.45		1.1		3.5
2020	2	27			-1.54167	-1.29583		-1.41875			-1.34167	-1.29444		-1.31806		-0.76528	-0.62917		-0.76528		0.2	0.7		0.45		1.1		3.5
2020	2	28			-1.28611	-0.97361		-1.13611			-1.10872	-1.06528		-1.0875		-0.7	-0.54861		-0.7		0.2	0.7		0.45		1.1		3.5
2020	2	29			-1.08889	-0.79444		-0.94167			-0.9375	-0.87639		-0.90694		-0.60972	-0.5		-0.60972		0.2	0.7		0.45		1.1		3.405556
2020	3	1			-0.91667	-0.7		-0.80833			-0.82639	-0.75278		-0.78958		-0.575	-0.40556		0.575		0.2	0.7		0.45		1.1		3.4
2020	3	2			-0.89167	-0.65833		-0.775			-0.79861	-0.7		-0.74931		-0.5	-0.30972		-0.5		0.2	0.7		0.45		1.1		3.4
2020	3	3			-0.8	-0.51111		-0.63556			-0.7	-0.63194		-0.66597		-0.5	-0.3		-0.5		0.2	0.7		0.45		1.1		3.4
2020	3	4			-0.70972	-0.5		-0.60486			-0.69722	-0.6		-0.64861		-0.5	-0.3		-0.5		0.2	0.7		0.45		1.1		3.4
2020	3	5			-0.8	-0.70094		-0.75347			-0.67361	-0.66389		-0.66875		-0.5	-0.22222		-0.5		0.2	0.723611		0.461806		1.1		3.376389
2020	3	6			-0.95278	-0.85694		-0.90486			-0.80556	-0.79722		-0.80139		-0.5	-0.29167		-0.5		0.2	0.797222		0.498611		1.1		3.3
2020	3	7			-1.14861	-1.22083		-1.18472			-0.93472	-1.03611		-0.98542		-0.5	-0.3		-0.5		0.2	0.8		0.5		1.1		3.3
2020	3	8			-1.3	-1.21111		-1.25556			-1	-1.1		-1.05		-0.50278	-0.36944		-0.50278		0.2	0.8		0.5		1.093056		3.3
2020	3	9			-1.35417	-1.21111		-1.28264			-1.05833	-1.09861		-1.07847		-0.59861	-0.4		-0.59861		0.2	0.8		0.5		1.055556		3.243833
2020	3	10			-1.4	-1.26806		-1.33403			-1.1625	-1.15		-1.16425		-0.6	-0.48472		-0.6		0.2	0.781944		0.490972		1.006944		3.2
2020	3	11			-1.37778	-1.14722		-1.2625			-1.14861	-1.09306		-1.12083		-0.6	-0.5		-0.6		0.2	0.705556		0.452778		1.001389		3.2

2020	3	12				-1.22222	-0.93889		-1.08056				-1.00278	-0.94722		-0.975			-0.6	-0.48611		-0.6		0.2	0.7		0.45		1			3.2
2020	3	13				-1.27639	-1.68194		-1.47917				-1.14722	-1.31944		-1.33333			-0.6	-0.44167		-0.6		0.2	0.7		0.45		1			3.2
2020	3	14				-1.68056	-2.18056		-1.93056				-1.51111	-1.79861		-1.65486			-0.65	-0.54306		-0.65		0.2	0.7		0.45		1			3.2
2020	3	15				-2.04028	-2.61806		-2.32917				-1.77361	-2.09306		-1.93333			-0.74444	-0.66111		-0.74444		0.2	0.7		0.45		1			1.1375
2020	3	16				-2.26806	-2.61667		-2.44236				-1.99861	-2.20139		-2.1			-0.86806	-0.78056		-0.86806		0.129167	0.7		0.414583		1			3.1
2020	3	17				-2.09722	-2.07639		-2.08681				-1.84722	-1.90694		-1.87708			-0.9	-0.8		-0.9		0.1	0.7		0.4		1			3.1
2020	3	18				-1.96806	-2.19028		-2.07917				-1.74722	-1.90417		-1.82569			-0.9	-0.8		-0.9		0.1	0.7		0.4		1			3.1
2020	3	19				-2.13194	-2.40833		-2.27014				-1.86111	-2.03194		-1.94663			-0.9	-0.8		-0.9		0.1	0.7		0.4		1			3.1
2020	3	20				-2.27222	-2.56806		-2.42014				-1.97917	-2.14583		-2.0625			-0.93056	-0.86667		-0.93056		0.1	0.7		0.4		1			3.1
2020	3	21				-2.38333	-2.58333		-2.48333				-2.05417	-2.19722		-2.17569			-1	-0.9		-1		0.1	0.7		0.4		0.9875			3.1
2020	3	22				-2.19306	-2.17083		-2.18194				-1.94306	-1.97778		-1.96042			-1	-0.9		-1		0.1	0.7		0.4		0.915278			3.1
2020	3	23				-1.82083	-1.6		-1.71042				-1.61944	-1.6		-1.60972			-0.92917	-0.83333		-0.92917		0.1	0.7		0.4		0.9			3.1
2020	3	24				-1.46528	-1.28056		-1.37292				-1.34444	-1.30694		-1.32569			-0.82917	-0.70556		-0.82917		0.1	0.7		0.4		0.9			3.03056
2020	3	25				-1.30556	-1.16528		-1.23942				-1.20278	-1.2		-1.20139			-0.71917	-0.60378		-0.72917		0.1	0.7		0.4		0.9			3
2020	3	26				-1.3	-1.23611		-1.26806				-1.2	-1.1875		-1.19375			-0.7	-0.57361		-0.7		0.1	0.7		0.4		0.9			3
2020	3	27				-1.12639	-0.83056		-0.97847				-1.00139	-0.96528		-0.98333			-0.68333	-0.5		-0.68333		0.1	0.7		0.4		0.9			3
2020	3	28				-0.80278	-0.64306		-0.72292				-0.8125	-0.74583		-0.77917			-0.6	-0.45833		-0.6		0.1	0.7		0.4		0.9			3
2020	3	29				-0.8	-0.8		-0.8				-0.8	-0.8		-0.8			-0.52083	-0.39167		-0.52083		0.1	0.7		0.4		0.9			3
2020	3	30				-0.92639	-0.9175		-0.93194				-0.84083	-0.88333		-0.86408			-0.5	-0.31528		-0.5		0.1	0.7		0.4		0.9			3
2020	3	31				-1	-0.87778		-0.93889				-0.9	-0.90139		-0.90069			-0.5	-0.4		-0.5		0.1	0.7		0.4		0.9			2.981944
2020	4	1				-1.02222	-0.91111		-0.96667				-0.9	-0.89028		-0.89514			-0.5	-0.4		-0.5		0.1	0.7		0.4		0.9			2.9
2020	4	2				-1.23056	-1.30833		-1.26944				-1.01389	-1.11528		-1.06458			-0.54028	-0.40278		-0.54028		0.1	0.7		0.4		0.9			2.9
2020	4	3				-1.47639	-1.61667		-1.54653				-1.25972	-1.35056		-1.30784			-0.6	-0.5		-0.6		0.1	0.7		0.4		0.9			2.9
2020	4	4				-1.52361	-1.49861		-1.51111				-1.3	-1.37361		-1.31681			-0.69306	-0.55		-0.69306		0.1	0.7		0.4		0.9			2.9
2020	4	5				-1.49722	-1.425		-1.46111				-1.3	-1.3		-1.3			-0.7	-0.6		-0.7		0.1	0.7		0.4		0.9			2.9
2020	4	6				-1.35833	-1.22083		-1.28956				-1.21867	-1.18611		-1.20139			-0.7	-0.56389		-0.7		0.1	0.7		0.4		0.9			2.9
2020	4	7				-1.19306	-0.94444		-1.06875				-1.03194	-1.0125		-1.02222			-0.65833	-0.5		-0.65833		0.1	0.7		0.4		0.895833			2.9
2020	4	8				-0.95417	-0.7		-0.82708				-0.85694	-0.77917		-0.81806			-0.6	-0.46528		-0.6		0.1	0.7		0.4		0.854367			2.9
2020	4	9				-0.85694	-0.57083		-0.71389				-0.77639	-0.68611		-0.73125			-0.5375	-0.3625		-0.5375		0.1	0.7		0.4		0.805366			2.83056
2020	4	10				-0.60417	-0.20278		-0.40347				-0.62639	-0.5125		-0.56944			-0.5	-0.3		-0.5		0.1	0.7		0.4		0.801389			2.8

2020	4	11			-0.31528	-0.09306		-0.20417			-0.49861	-0.34861		-0.42361		-0.46806	-0.23333		-0.46806		0.1	0.7		0.4		0.8		2.8
2020	4	12			-0.35	-0.34983		-0.34792			-0.475	-0.44722		-0.46111		-0.32083	-0.2		-0.32083		0.165278	0.7		0.432639		0.8		2.8
2020	4	13			-0.59861	-0.81528		-0.70694			-0.59722	-0.69861		-0.64792		-0.3	-0.2		-0.3		0.2	0.7		0.45		0.8		2.8
2020	4	14			-0.48889	-0.28472		-0.38681			-0.56944	-0.525		-0.54722		-0.3	-0.2		-0.3		0.2	0.7		0.45		0.8		2.8
2020	4	15			-0.11667	0.186111		0.034722			-0.30694	-0.20833		-0.25764		-0.3	-0.2		-0.3		0.2	0.7		0.45		0.8		2.8
2020	4	16			-0.07778	0.208333		0.065278			-0.2	-0.10278		-0.15139		-0.3	-0.14306		-0.3		0.2	0.7		0.45		0.8		2.8
2020	4	17			0	0.3		0.15			-0.2	-0.0375		-0.11875		-0.23056	-0.1		-0.23056		0.2	0.7		0.45		0.8		2.8
2020	4	18			0	0.3		0.15			-0.1125	0		-0.05625		-0.2	-0.1		-0.2		0.2	0.7		0.45		0.8		2.8
2020	4	19			0	0.3		0.15			-0.06111	0.0375		-0.01181		-0.2	-0.0875		-0.2		0.2	0.7		0.45		0.8		2.98722
2020	4	20			0	1.026389		0.513194			0	0.145833		0.072917		-0.2	0.025		-0.2		0.218056	0.7		0.439028		0.8		2.465278
2020	4	21			2.555556	4.9625		3.759028			0.395833	1.220833		0.808333		-0.16111	0.1		-0.16111		0.3	0.763889		0.531944		0.8		2.6875
2020	4	22			4.802778	5.870833		5.336806			1.940278	2.573611		2.256944		-0.1	0.1		-0.1		0.3	0.8		0.55		0.8		2.7
2020	4	23			5.270833	6.3375		5.804167			2.804167	3.35		3.127083		-0.1	0.1		-0.1		0.3	0.8		0.55		0.8		2.7
2020	4	24			6.405556	7.444444		6.925			3.990378	4.388889		4.189583		-0.09028	0.1		-0.09038		0.3	0.8		0.55		0.8		2.7
2020	4	25			6.108333	6.759722		6.434028			4.084722	4.3875		4.236111		0	0.147222		0		0.3	0.8		0.55		0.8		2.7
2020	4	26			7.301389	8.005944		7.654167			5.036111	5.315278		5.175694		0.038889	0.586111		0.038889		0.3	0.8		0.55		0.8		2.7
2020	4	27			7.236111	7.704167		7.470139			5.309722	5.547222		5.428472		0.377778	1.098611		0.377778		0.3	0.8		0.55		0.8		2.7
2020	4	28			7.022222	7.680556		7.351389			5.101389	5.358333		5.229861		0.777778	1.4		0.777778		0.3	0.8		0.55		0.8		2.7
2020	4	29			8.699722	9.184722		8.922222			6.113889	6.373611		6.24375		1.272222	1.848611		1.272222		0.3	0.8		0.55		0.8		2.7
2020	4	30			8.227778	8.573611		8.400694			6.606944	6.797222		6.702083		1.970833	2.540278		1.970833		0.3	0.8		0.55		0.8		2.7
2020	5	1			7.969444	8.613444		8.294444			6.111111	6.369444		6.240278		2.118056	2.577778		2.118056		0.3	0.8		0.55		0.8		2.7
2020	5	2			8.922222	9.397222		9.159722			6.663889	6.918056		6.790972		2.504167	2.869444		2.504167		0.397222	0.8		0.598611		0.8		2.7
2020	5	3			9.25	9.606944		9.428472			7.427778	7.647222		7.5375		3.131944	3.511944		3.131944		0.595833	0.804167		0.7		0.8		2.7
2020	5	4			8.776389	9.181944		8.879167			7.1625	7.345833		7.254167		3.543056	3.85		3.543056		1.169444	1.122222		1.145833		0.845833		2.619444
2020	5	5			9.6625	9.958333		9.810417			7.423611	7.645833		7.534722		3.708333	4.044444		3.708333		1.875	1.879167		1.877083		0.930556		2.6
2020	5	6			10.93778	11.21806		11.07292			8.527778	8.783333		8.655556		4.352778	4.784722		4.352778		2.580556	2.622222		2.601389		1.118056		2.6
2020	5	7			11.20139	11.53611		11.36875			9.301389	9.5625		9.431944		5.291667	5.673611		5.291667		3.448611	3.523611		3.486111		1.420833		2.6
2020	5	8			11.5125	12.06806		11.79028			9.8125	10.08194		9.947222		6.097222	6.470833		6.097222		4.290278	4.373611		4.331944		1.831944		2.6
2020	5	9			9.445833	10.00094		9.726389			9.051389	9.263889		9.157639		6.518889	6.868056		6.518889		5.011111	5.113889		5.0625		2.319444		2.6
2020	5	10			7.966667	8.108333		8.0375			7.773611	7.911111		7.842361		6.415278	6.701389		6.415278		5.361111	5.544444		5.452778		2.781944		2.6

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2020	6	10	14.31944	13.67917	15.58472	16.35139	13.99931	15.96806	12.37361	12.65694	14.47083	14.69167	12.51528	14.58125	10.75694	10.98889	12.36528	12.55694	10.87292	11.67708	10.52361	11.67083	12.05694	10.52361	11.86389	8.7			7.273611	6.425927
2020	6	11	14.98889	14.35139	16.51528	17.22083	14.67014	16.86806	13.20278	13.50139	15.45833	15.68889	13.35208	15.57361	11.28056	11.50139	12.96528	13.17917	11.39097	12.23333	10.79861	11.95	12.30278	10.79861	12.12639	8.709722			7.361111	6.556944
2020	6	12	16.20094	15.46111	17.83333	18.57639	15.83403	18.20486	13.82083	14.13194	16.13889	16.38056	13.97639	16.23972	11.70139	11.91944	13.46944	13.69028	11.81042	12.69444	11.125	12.28889	12.62083	11.125	12.45486	8.836111			7.408333	6.688055
2020	6	13	17.37222	16.68333	18.49028	18.97083	17.02778	18.73056	15.0625	15.40278	17.30278	17.50694	15.23264	17.40486	12.34306	12.56667	14.29583	14.53194	12.45486	13.43125	11.49861	12.68472	13.00278	11.49861	12.84375	8.943055			7.509722	6.784722
2020	6	14	16.49722	15.89028	17.91667	18.33889	16.19375	18.12778	15.06111	15.39167	16.98611	17.14167	15.22639	17.06389	12.87778	13.0875	14.6625	14.84583	12.98264	13.875	11.97917	13.12083	13.4375	11.97917	13.27917	9.125			7.6	6.9125
2020	6	15	15.01389	14.50417	16.82917	17.14028	14.75903	16.98472	14.3875	14.70556	16.48194	16.59306	14.54653	16.5375	13.00833	13.20417	14.82083	14.97083	13.10625	14.0125	12.26944	13.42361	13.73472	12.26944	15.57917	9.3375			7.731944	7
2020	6	16	15.33333	14.75694	16.64306	17.34861	15.04514	16.99583	13.9875	14.28472	16.08611	16.26111	14.13611	16.17361	12.79444	12.9875	14.63056	14.78333	12.85087	13.80903	12.32083	13.55	13.89861	12.32083	13.72451	9.547222			7.848611	7.115278
2020	6	17	14.45972	14.01389	15.75278	16.12361	14.23681	15.93819	13.98472	14.27778	16.00139	16.125	14.13125	16.06319	12.85	13.05417	14.71111	14.88611	12.95208	13.88264	12.36944	13.61944	13.97083	12.36944	13.79514	9.709722			7.983333	7.236111
2020	6	18	14.0875	13.52222	15.20972	15.84722	13.80486	15.52847	13.18333	13.45556	14.95972	15.13889	13.31944	15.04931	12.54306	12.74028	14.25694	14.3875	12.64167	13.49861	12.35694	13.59306	13.97917	12.35694	13.78611	9.881944			8.113889	7.352778
2020	6	19	14.74722	14.21806	15.71667	16.65417	14.48264	16.18542	13.46389	13.7375	15.3375	15.59722	13.60009	15.46736	12.4375	12.63472	14.12222	14.29444	12.53611	13.37847	12.2625	13.48472	13.88611	12.2625	13.68542	9.975			8.226389	7.443056
2020	6	20	15.71806	15.14722	17.17083	18.12361	15.43264	17.64722	14.04722	14.31528	16.1375	16.43194	14.18125	16.28472	12.56806	12.78194	14.26528	14.46667	12.675	13.52361	12.26944	13.47778	13.86944	12.26944	13.67361	10.0125			8.320833	7.551389
2020	6	21	15.175	14.66806	17.34167	17.74028	14.92153	17.54087	14.1375	14.42917	16.44028	16.83472	14.28333	16.7375	12.82083	13.03194	14.68889	14.90556	12.92639	13.86042	12.40694	13.63194	14.00278	12.40694	13.81736	10.1			8.416666	7.65
2020	6	22	16.78889	16.12917	18.62222	19.2625	16.45903	18.94236	14.625	14.94722	17.08056	17.29583	14.78611	17.18819	12.90139	13.10694	14.88806	15.04444	13.00417	13.9875	12.50139	13.83333	14.16111	12.50139	13.99722	10.19167			8.5	7.743833
2020	6	23	18.03944	17.35417	19.54583	20.34306	17.68681	19.94444	15.66528	15.98611	18.15417	18.41667	15.82569	18.28542	13.39833	13.57083	15.40139	15.58333	13.46458	14.48611	12.70833	14.06528	14.37778	12.70833	14.22153	10.26806			8.588889	7.848611
2020	6	24	17.51806	16.98056	18.72639	19.27917	17.24931	19.00278	15.90833	16.22778	18.06528	18.26806	16.08806	18.16667	13.85694	14.09444	15.83472	16.02361	13.97569	14.96458	13.04583	14.40278	14.69028	13.04583	14.54653	10.325			8.666667	7.931945
2020	6	25	17.18472	16.64306	17.89583	18.74861	16.91389	18.32222	15.55833	15.85417	17.3	17.54444	15.70625	17.42222	13.95694	14.20278	15.73333	15.90417	14.07886	14.96806	13.27917	14.59306	14.89444	15.27917	14.74375	10.52639			8.761111	8.031333
2020	6	26	17.01806	16.52917	18.68333	18.99861	16.77361	18.84087	15.73889	16.03889	17.69861	17.90972	15.88889	17.80417	14.08472	14.33056	15.80694	15.98611	14.20704	15.06875	13.43056	14.66806	14.975	13.43056	14.82153	10.66111			8.868055	8.152778
2020	6	27	16.22083	15.78056	18.36528	18.80139	16.00069	18.58333	15.39972	15.67222	17.64444	17.80556	15.51597	17.725	14.075	14.34861	15.91806	16.07361	14.21181	15.13333	13.54722	14.78889	15.09861	13.54722	14.94375	10.80417			8.963889	8.272222
2020	6	28	15.37917	14.97917	17.25972	17.62222	15.17917	17.44087	14.77361	15.075	17.06528	17.20278	14.92431	17.13403	13.91667	14.13694	13.85278	16.01111	14.03861	15.00486	13.56528	14.9	15.2	13.56528	15.05	10.92361			9.068056	8.345833
2020	6	29	15.93889	15.46806	18.02639	18.57639	15.70347	18.30139	14.76944	15.07917	17.10556	17.30833	14.92431	17.20694	13.74583	13.99167	15.69722	15.81528	13.86875	14.84444	13.48194	14.89444	15.2	13.48194	15.04722	11.00833			9.168056	8.427778
2020	6	30	15.39722	15.04306	16.83194	17.20278	15.22014	17.01796	14.88611	15.20139	17.03056	17.17917	15.04375	17.10486	13.85	14.06389	15.83333	15.99583	13.95694	14.94861	13.48333	14.90833	15.25278	13.48333	15.08056	11.1			9.269445	8.5
2020	7	1	15.38472	14.95417	16.89167	17.23611	15.16944	17.06389	14.63194	14.94028	16.48889	16.61944	14.78611	16.55417	13.73333	14	15.59028	15.70972	13.80667	14.79514	13.5	14.9	15.3	13.5	15.1	11.175			9.356944	8.588889
2020	7	2	15.00417	14.59861	16.81944	17.225	14.80139	17.02222	14.46389	14.78833	16.45417	16.58194	14.61111	16.51806	13.71806	13.93556	15.53889	15.64444	13.83861	14.74722	13.5	14.9	15.29444	13.5	15.09722	11.25694			9.433333	8.693055
2020	7	3	15.98194	15.52778	17.14028	17.8125	15.75486	17.47639	14.7375	15.03056	16.70506	16.89306	14.88403	16.79931	13.66528	13.86667	15.53889	15.65417	15.76087	14.70278	13.5	14.9	15.27361	13.5	15.08681	11.32917			9.531945	8.790278
2020	7	4	16.36667	15.96667	17.19861	17.84444	16.16667	17.52153	15.31111	15.59167	17.09567	17.29444	15.45139	17.19306	13.9125	14.15	15.7	15.85	14.03125	14.925	13.55694	14.95278	15.28889	13.55694	15.12083	11.4			9.622222	8.9
2020	7	5	15.90872	15.49306	17.24167	17.74806	15.70139	17.50486	15.11389	15.39861	16.82778	17.02639	15.25625	16.92708	14.04583	14.25694	15.69583	15.8375	14.15139	14.97639	15.67917	15	15.38194	13.67917	15.19087	11.41528			9.7	8.968055
2020	7	6	16.27778	15.80278	16.93472	17.55833	16.04028	17.24633	15.06806	15.35972	16.64367	16.83056	15.21389	16.73611	14.00833	14.24444	15.65417	15.79028	14.12639	14.94931	13.7	15.00278	15.4	13.7	15.20139	11.5			9.776389	9.05
2020	7	7	16.09583	15.64306	17.07222	17.48472	15.86944	17.27847	15.29167	15.59306	16.95139	17.11806	15.44236	17.03472	14.12361	14.3625	15.71111	15.85833	14.24306	15.03681	13.85833	15.00417	15.4	13.85833	15.20208	11.59444			9.854167	9.1
2020	7	8	15.43472	14.96944	16.46944	16.75139	15.20208	16.61042	14.93611	15.23056	16.37083	16.49028	15.08333	16.43056	14.16111	14.39306	15.67778	15.78889	14.27708	15.03542	14	15.09167	15.43333	14	15.2625	11.625			9.9	9.919667
2020	7	9	16.33333	15.77361	16.86136	17.49722	16.05347	17.17929	15.02083	15.33056	16.45	16.6	15.17569	16.525	14.05	14.25417	15.52955	15.61944	14.15208	14.89186	13.91806	15.05833	15.4	13.91806	15.22917	11.72083			9.995833	9.273611

2020	7	10	16.57917	16.05139	17.10278	17.78611	16.31528	17.44444	15.48056	15.77917	16.8375	17.0375	15.62986	16.9375	14.24306	14.46667	15.69028	15.80278	14.35486	15.07847	13.975	15.06806	15.45972	13.975	15.26389	11.8		10.0625	9.343055
2020	7	11	17.36806	16.73056	17.65278	18.36806	16.99931	18.01042	15.84306	16.14306	17.22917	17.44583	15.99306	17.3375	14.42472	14.65139	15.81944	15.97917	14.54306	15.23542	14.1	15.16389	15.53889	14.1	15.35139	11.82639		10.19306	8.453555
2020	7	12	17.21111	16.72639	17.91944	18.52639	16.96875	18.22292	16.17639	16.48611	17.56944	17.77639	16.33125	17.87292	14.68611	14.92917	16.05556	16.23333	14.80764	14.9236	14.26944	15.28944	15.65	14.26944	15.45972	11.9		10.24028	9.5
2020	7	13	15.41111	14.99444	16.52639	17.00139	15.20278	16.76389	15.23472	15.51389	16.77639	16.92361	15.37431	16.85	14.63972	14.87083	16.02917	16.18472	14.76528	15.45	14.4	15.38611	15.75	14.4	15.56806	11.95833		10.3	9.586111
2020	7	14	15.60833	15.05417	16.78472	17.36667	15.33125	17.07969	14.78194	15.09722	16.49583	16.71389	14.93958	16.40486	14.30278	14.5125	15.75139	15.87639	14.40764	15.13194	14.27361	15.3125	15.69583	14.27361	15.50417	12.07778		10.38056	9.659722
2020	7	15	16.1375	15.55	17.71944	18.35417	15.84375	18.03881	14.99861	15.31389	17.06389	17.29861	15.15625	17.18125	14.20694	14.43472	15.76944	15.92639	14.32083	15.10208	14.17222	15.29722	15.63056	14.17222	15.46389	12.1		10.45556	9.709722
2020	7	16	16.75	16.17083	17.75972	18.3	16.46042	18.02986	15.45139	15.76111	17.40583	17.70417	15.60625	17.6	14.29444	14.50833	16.03472	16.17778	14.40139	15.27153	14.1625	15.52639	15.68194	14.1625	15.50417	12.1		10.5	9.8
2020	7	17	16.56389	16.02361	16.95278	17.60417	16.29375	17.27847	15.50972	15.80833	16.79167	16.98889	15.65903	16.89028	14.45972	14.67639	16.00139	16.12083	14.56806	15.33889	14.26806	15.40694	15.79306	14.26806	15.6	12.16806		10.5875	9.826389
2020	7	18	18.29306	15.80694	17.49444	18.12917	16.05	17.81181	15.49167	15.79306	17.19722	17.41111	15.64236	17.30417	14.55278	14.76528	16.00139	16.1625	14.63903	15.38833	14.3625	15.40833	15.8	14.3625	15.60417	12.2		10.6	9.9
2020	7	19	16.73194	16.19167	18.21389	18.75278	16.46181	18.48333	15.9167	15.91944	17.64028	17.84444	15.75556	17.74236	14.56944	14.8	16.16389	16.3375	14.68472	15.48194	14.4	15.48472	15.85972	14.4	15.67222	12.24167		10.68889	9.955555
2020	7	20	17.26667	16.72639	17.74028	18.34167	16.99653	18.04097	15.84167	16.16667	17.51111	17.70417	16.00417	17.60764	14.65694	14.87222	16.31389	16.47917	14.76458	15.59306	14.45972	15.59444	15.97083	14.45972	15.78264	12.3		10.71667	10
2020	7	21	17.56806	17.03194	18.76389	19.21806	17.3	18.99987	16.21111	16.53611	17.84028	18.04583	16.37361	17.94306	14.85417	15.08056	16.56944	16.50972	14.96736	15.71875	14.55278	15.68194	18.05833	14.55278	15.87014	12.37083		10.8	10.05139
2020	7	22	18.06111	17.47917	18.70278	19.34167	17.77014	19.02222	16.525	16.85	18.26528	18.47778	16.6875	18.37153	15.03333	15.24028	16.47222	16.80139	15.13681	19.94375	14.66389	15.77083	16.15695	14.66389	15.96389	12.4		10.81389	10.1
2020	7	23	18.0875	17.58472	18.88611	19.34306	17.83611	19.11458	16.87917	17.2	18.48194	18.66528	17.03958	18.57361	15.30417	15.54028	16.34306	17	15.42222	16.19167	14.86806	15.95417	16.3875	14.86806	16.12083	12.46389		10.9	10.18944
2020	7	24	16.77361	16.31667	17.725	18.09583	16.54514	17.91042	16.275	16.58889	17.69583	17.81944	16.43194	17.75764	15.39583	15.60833	16.84583	16.96944	15.50208	16.22708	15.02222	16.08472	16.43056	15.02222	16.25764	12.58056		10.94722	10.2
2020	7	25	16.39444	15.93056	16.87222	17.31389	16.1625	17.09306	15.78056	16.09167	17.16111	17.29583	15.93611	17.22847	15.175	15.35833	16.60972	16.72361	15.26667	15.98403	14.99722	16.07083	16.4	14.99722	16.23542	12.66111		11	10.24861
2020	7	26	16.61194	16.14722	16.6	17.20139	16.8958	16.90069	15.65139	15.94861	16.64444	16.83194	15.8	16.73819	14.99167	15.18889	16.2375	16.36528	15.09028	15.71319	14.88889	15.82917	16.32817	14.88889	16.12817	12.725		11.08889	10.3
2020	7	27	17.95278	17.40139	17.82222	18.49583	17.67708	18.15903	16.24583	16.55	17.2375	17.47361	16.39792	17.3556	15.00278	15.20556	16.15972	16.30278	15.10417	15.68264	14.84444	15.79444	16.2	14.84444	15.99722	12.8		11.11111	10.39028
2020	7	28	19.23056	18.64444	19.12639	19.79167	18.9375	19.45903	17.12917	17.44167	18.17639	18.45417	17.28542	18.33528	15.28472	15.55417	18.47639	16.63194	15.43944	16.01528	14.95417	15.80278	16.2	14.95417	16.00139	12.8		11.2	10.4056
2020	7	29	20.13611	19.53472	20.20694	20.83472	19.83542	20.52083	17.9625	18.27917	19.10694	19.37083	18.12083	19.23889	15.74444	15.9875	16.95556	17.13194	15.86597	16.47153	15.18194	16.01111	16.35972	15.18194	16.18542	12.8		11.22917	10.5
2020	7	30	20.06528	19.51111	20.39861	20.95972	19.78819	20.67917	18.25139	18.56806	19.44583	19.68472	18.40972	19.56528	16.12083	16.275	17.37778	17.52639	16.24792	16.87639	15.4625	16.26111	16.61806	15.4625	16.43958	12.88611		11.3	10.52222
2020	7	31	19.85694	19.30417	19.87222	20.46528	19.58056	20.16875	18.17778	18.50278	19.21389	19.4375	18.34028	19.32569	16.30417	16.55833	17.55	17.70278	16.43125	17.05417	15.67639	16.475	16.83194	15.67639	16.65347	13		11.35694	10.6
2020	8	1	19.96389	19.40417	20.09306	20.69444	19.68403	20.39375	18.30417	18.63472	19.33611	19.56111	18.46944	19.44861	16.4375	16.68195	17.63194	17.78194	16.55972	17.15694	15.85556	16.58472	16.96528	15.85556	16.775	13.11806		11.40139	10.6
2020	8	2	20.46111	19.88194	20.27222	20.89167	20.17153	20.58194	18.54444	18.88889	19.4625	19.69306	18.71667	19.57778	16.56389	18.83333	17.74444	17.88889	16.69861	17.28889	15.97361	16.68472	17.06111	15.97361	16.87292	13.20972		11.5	10.67361
2020	8	3	19.72778	19.25833	20.02361	20.51944	19.49306	20.27153	18.66389	19.01111	19.64444	19.85	18.8375	19.74722	16.82361	17.07361	17.92083	18.05694	16.94861	17.49722	16.14444	16.83472	17.17083	16.14444	17.00278	13.36944		11.57222	10.7
2020	8	4	18.18056	17.75278	17.93194	18.45583	17.96667	18.21389	17.60972	17.94444	18.36389	18.53333	17.77708	18.44861	16.70694	16.92222	17.76806	17.88611	16.81458	17.34514	16.26111	16.50917	17.3	16.26111	17.11458	13.475		11.64306	10.77778
2020	8	5	18.69444	18.19583	18.18333	18.82778	18.44514	18.50556	17.44722	17.77083	18.02778	18.25278	17.60903	18.14028	16.40694	16.62361	17.32778	17.45694	16.51528	16.97569	16.15833	16.78472	17.17361	16.15833	16.97917	13.56528		11.73333	10.8
2020	8	6	19.5125	18.975	18.94167	19.52917	19.24375	19.23542	17.95	18.27778	18.45833	18.68889	18.11389	18.57361	16.44028	16.66806	17.29028	17.42639	16.55417	16.97917	16.1	16.7	17.07917	16.1	16.88958	13.6		11.8	10.83056
2020	8	7	17.18194	16.83056	16.99861	17.26111	17.00625	17.12986	17.54861	17.89444	17.95	18.08056	17.72153	18.05528	16.61667	18.83611	17.39306	17.54444	16.72639	17.11458	16.17361	16.72361	17.07639	16.17361	16.9	13.65833		11.8875	10.9
2020	8	8	15.11389	14.77361	14.90556	15.26111	14.94375	15.08333	15.48333	15.82083	15.7375	15.84306	15.65208	15.79028	15.95139	16.14722	16.56389	16.6625	16.04931	16.35556	16.06806	16.58806	16.98056	16.06806	16.77431	13.76667		11.9	10.9875

2020	8	9	14.95556	14.6	14.71111	15.18194	14.77778	14.94653	15	15.31806	15.33194	15.47917	15.15903	15.40556	15.31944	15.52778	15.90417	16.00694	15.42361	15.71597	15.66389	16.15972	16.60972	15.66389	16.38472	13.8		11.99583	11
2020	8	10	15.26844	14.84861	14.97917	15.50833	15.05903	15.24375	14.94167	15.25278	15.33889	15.5375	15.09712	15.43819	14.98333	15.19306	15.54444	15.65556	15.08819	15.36875	15.34583	15.835	16.2875	15.34583	16.05635	13.74444		12.05417	11.09028
2020	8	11	14.70278	14.30417	13.80556	14.30972	14.50347	14.10764	14.68194	14.98056	14.79583	14.94722	14.83125	14.87153	14.76944	15	15.30833	15.41528	14.88472	15.15417	15.13889	15.61111	16.06528	15.13889	15.83819	13.62639		12.1	11.1
2020	8	12	14.48611	14.09306	14.43611	14.89722	14.28958	14.66667	14.45139	14.77222	14.76389	14.93333	14.61181	14.84861	14.51944	14.77083	14.99167	15.1	14.64514	14.88125	14.95556	15.35972	15.82083	14.95556	15.95028	13.58194	12.1	11.19583	
2020	8	13	14.42917	14.03194	14.30972	14.78056	14.23056	14.54514	14.21189	14.53889	14.67778	14.85	14.37639	14.76389	14.30556	14.54444	14.85278	14.97639	14.425	14.69861	14.76389	15.175	15.65139	14.76389	15.41319	13.50278	12.1	11.2	
2020	8	14	14.75972	14.35139	14.58472	15.07778	14.55556	14.83125	14.34722	14.65833	14.75972	14.95278	14.50278	14.85625	14.16806	14.45	14.775	14.89722	14.30903	14.6125	14.60417	15.04722	15.49028	14.60417	15.26875	13.4375	12.1	11.2	
2020	8	15	15.80139	15.32639	16.0625	16.4875	15.56389	16.275	14.81944	15.13472	15.575	15.80278	14.97708	15.68889	14.20556	14.4625	14.66944	15.00972	14.33403	14.66597	14.5	15	15.4	14.5	15.2	13.375	12.1	11.21528	
2020	8	16	16.88333	16.35972	16.23889	16.76667	16.62153	16.50278	15.41667	15.74167	15.89028	16.10556	15.57917	15.99792	14.4	14.65417	15.15	15.27861	14.52708	14.90208	14.56667	15	15.45972	14.56667	15.22986	13.24861	12.1	11.3	
2020	8	17	17.94444	17.41667	17.21806	17.71944	17.68056	17.46875	16.34083	16.69028	16.53972	16.79722	16.51806	16.67847	14.775	15.04861	15.39306	15.54861	14.91181	15.22083	14.89444	15.11667	15.53472	14.89444	15.32969	13.2		12.06667	11.3
2020	8	18	18.69722	18.13056	17.56111	18.11806	18.41389	17.83958	16.93194	17.29861	16.96667	17.19861	17.11528	17.08264	15.18333	15.45	15.73611	15.875	15.31667	15.59306	14.92917	15.26667	15.66111	14.92917	15.46389	13.2	14.1	12	11.3
2020	8	19	18.5375	18.05139	17.21389	17.71667	18.29444	17.46528	17.33056	17.69861	17.10833	17.32639	17.51458	17.21736	15.58056	15.83056	16.00556	16.14028	15.70556	15.91806	15.18889	15.43056	15.80694	15.18889	15.61875	13.23333	14.1	12	11.3
2020	8	20	17.95139	17.49861	17.41667	17.82917	17.725	17.62292	17.06528	17.43333	17.01389	17.20972	17.24931	17.11181	15.73611	15.95972	16.01111	16.19695	15.84792	15.98542	15.375	15.50139	15.9	15.375	15.70069	13.36111	14.1	12.00694	11.3
2020	8	21	17.52917	17.09722	17.29722	17.69167	17.31319	17.49444	16.73889	17.09722	17.0625	17.24722	16.91806	17.15486	15.70833	15.94861	16.11806	16.25278	15.82847	16.03333	15.48333	15.59861	15.98254	15.48333	15.79058	13.43194	14.1	12.09861	11.3
2020	8	22	16.81528	16.44583	16.44545	17.11778	16.83956	16.78662	16.4875	16.83333	16.93889	17.05694	16.66042	16.99817	15.66806	15.90556	16.18788	16.27778	15.78881	16.04672	15.5	15.68333	16	15.5	15.84167	13.5		12.1	11.3
2020	8	23	15.67917	15.29306		15.15278	15.48611	15.15278	15.54306	15.89722		15.66944	15.72034	15.66944	15.39167	15.60833	15.94167	15.5	15.60833	15.45833	15.68944		15.45833	15.66944	15.54861		12.12778	11.30694	
2020	8	24	15.87083	15.46667		15.68889	15.66875	15.68889	15.45139	15.79861		15.55139	15.625	15.55139	15.09583	15.31528	15.44167	15.20556	15.31528	15.26806	15.43194		15.26806	15.43194	13.59861		12.2	11.4	
2020	8	25	15.19028	14.80139	15.07619	15.01111	14.99583	15.04365	15.04306	15.39306	14.79524	15.24028	15.21806	15.01776	14.94444	15.15694	15.10952	15.32083	15.05009	15.13323	15.15833	15.28056		15.15833	15.28056	13.59861		12.2	11.4
2020	8	26	15.21667	14.81111	15.1	14.69444	15.01389	14.89722	14.90417	15.26389	15.15	14.87361	15.08403	15.01181	14.7375	14.92639	14.95	15.03194	14.83194	14.93819	14.98333	15.12639	14.98333	15.12639	13.57083		12.2	11.4	
2020	8	27	14.63333	14.2625		14.28472	14.44792	14.28472	14.58056	14.93472		14.53889	14.75764	14.53889	14.60417	14.78056	14.76111	14.69286	14.78056	14.86667	14.95556		14.86667	14.95556	13.50278		12.2	11.4	
2020	8	28	14.20833	13.81944		13.69306	14.01389	13.69306	14.07778	14.43194		13.95278	14.25486	13.95278	14.30594	14.50556		14.45556	14.40625	14.50556	14.70556	14.76528	14.70556	14.76528	13.5		12.26389	11.4	
2020	8	29	13.96667	13.6125		13.875	13.78958	13.875	14.10833	14.4625		14.22222	14.28542	14.22222	14.16528	14.35972	14.53611	14.7625	14.35972	14.53611	14.57222		14.53611	14.57222	13.43472		12.28889	11.4	
2020	8	30	12.42361	12.09306		11.77917	12.25833	11.77917	13.03889	13.38611		12.84861	13.2125	12.84861	13.83194	13.99444		13.96528	13.91319	13.99444	14.36944	14.42917		14.36944	14.42917	13.39167		12.20833	11.40417
2020	8	31	11.77778	11.44167		11.02639	11.60972	11.02639	12.24722	12.6		11.74306	12.42361	11.74306	13.30972	13.43889		13.2	13.37431	13.43889	14.07361	14.08889		14.07361	14.08889	13.25417		12.2	11.48056
2020	9	1	13.80833	13.31889		13.25556	13.57361	13.25556	13.05417	13.44444		12.95	13.24931	12.95	13.10556	13.22639		13.02222	13.16997	13.22639	13.74028	13.78056		13.74028	13.78056	13.17083		12.2	11.5
2020	9	2	13.59722	13.20417		13.36806	13.40069	13.36806	13.41111	13.81944		13.36944	13.61528	13.36944	13.28056	13.41806		13.29167	13.34931	13.41806	13.7	13.69028		13.7	13.69028	13.04583		12.2	11.5
2020	9	3	12.69167	12.32222		12.51944	12.50894	12.51944	12.73611	13.1125		12.76806	12.92431	12.76806	13.15694	13.3		13.21111	13.22847	13.3	13.64722	13.6		13.64722	13.6	12.99306		12.16389	11.46528
2020	9	4	13.50833	13.07639		13.57639	13.29236	13.57639	12.99583	13.39583		13.24028	13.19583	13.24028	10.15972	13.16528		13.14722	11.6625	13.16528	13.50556	13.50833		13.50556	13.50833	12.89722		12.1	11.4
2020	9	5	14.13194	13.69028		14.01389	13.91111	14.01389	13.47222	13.9		13.81111	13.88611	13.81111	11.47917	13.27917		13.39028	12.37917	13.27917	13.5	13.5		13.5	13.5	12.8		12.1	11.4
2020	9	6	13.51389	13.125	13.2	13.33472	13.31944	13.26736	13.425	13.84583	13.8	13.56389	13.63542	13.68194	12.94861	13.36111	13.35	13.48194	12.85486	13.35556	13.5	13.58194	14.1	13.5	13.84097	12.78611		12.01111	11.4
2020	9	7	11.4875	11.19444	11.99524	11.18611	11.34097	11.59067	12.34444	12.74306		11.97857	12.34444	12.54375	12.16151	16.7528	13.15556	12.89048	13.21528	12.9861	13.02302	13.46806	13.54306		13.46806	13.54306	12.7	12	11.4

2020	9	8	11.02361	10.66667	11.42692	10.85139	10.84514	11.13956	11.36111	11.75417	11.40769	11.44306	11.55764	11.42537	2.190278	12.6125	12.30769	12.54583	7.401389	12.4601	13.21389	13.28611		13.21389	13.28611	12.67639		11.94306	11.4
2020	9	9	12.29583	11.83972	12.18	11.95417	12.07778	12.06768	11.81806	12.21806	11.65	11.84306	12.01806	11.74653	11.88056	12.3625	12.11	12.3	12.12153	12.23635	12.94038	13.01111		12.94038	13.01111	12.6		11.9	11.4
2020	9	10	14.40604	13.89583	13.58889	13.55278	14.15139	13.57083	13.0125	13.425	12.62778	13.01389	13.21875	12.82083	11.55833	12.5625	12.38889	12.51944	12.08042	12.47569	12.84861	12.9		12.84861	12.9	12.50139		11.9	11.4
2020	9	11	14.44444	14.00278	13.00833	13.15	14.22361	13.07917	13.72361	14.14861	12.71667	13.1625	13.93611	12.93958	1.311111	12.99722	12.65833	12.8375	7.154367	12.82778	13.00417	12.97778		13.00417	12.97778	12.4		11.875	11.34861
2020	9	12	12.41806	12.09167	12.18	11.71528	12.25486	11.94764	12.81944	13.3375	12.48	12.42361	13.12847	12.45181	-0.175	13.10556	12.64	12.79722	6.463278	12.87278	13.16389	13		13.16389	13	12.4		11.8	11.3
2020	9	13	11.19352	10.88889	10.9	11.02407	11.0412	10.96204	11.87222	12.28333	11.6	11.66759	12.07778	11.6338	-1.20185	12.76852	12.4	12.49074	5.783333	12.58426	13.08148	12.95185		13.08148	12.95185	12.4		11.8	11.3