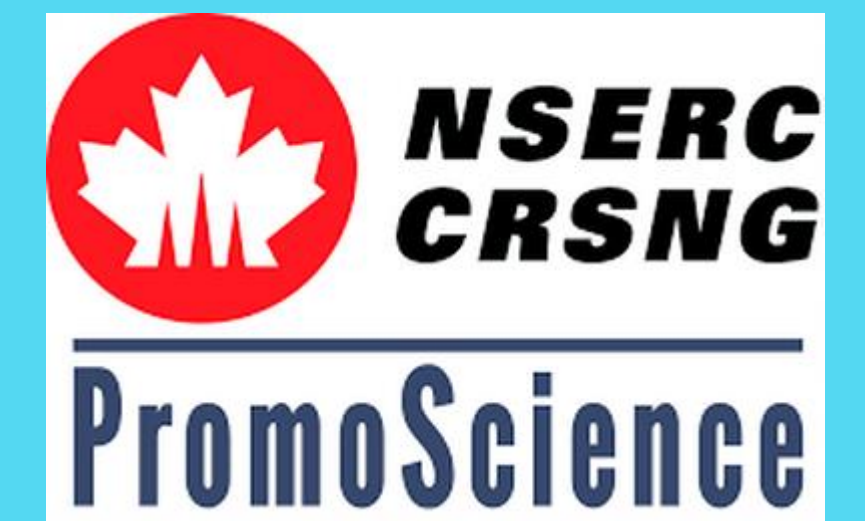


'X' Marks the Spot: Transferring Dig Site Coordinates from Maps to Google Earth

Supported By:



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Introduction

- Historically, record keeping of palaeontological dig sites has been unreliable; many quarries have been lost over the years (Tanke 2005).
- To keep track of the various dig sites, quarries, and bone beds at Dinosaur Provincial Park (DPP), metal stakes with the site's data on the head are drilled into the ground by the site (Leiggi and May 1994), and the location marked on a large paper map.
- These maps are impractical to use in the field.
- To locate and record the sites more efficiently, the coordinates of the old points were taken and uploaded into Google Earth.

Methods

- We first sorted through the paper maps to find which ones had points on them.

Figure 1: Some of the old maps that had points marked. They were placed separately from blank maps to differentiate them.



- As the old maps had no coordinate measurements shown, the points were first transferred to clear mylar maps.
- A smaller mylar map, scaled back to show the entirety of DPP, was used to match old paper maps to the section of DPP they depict.

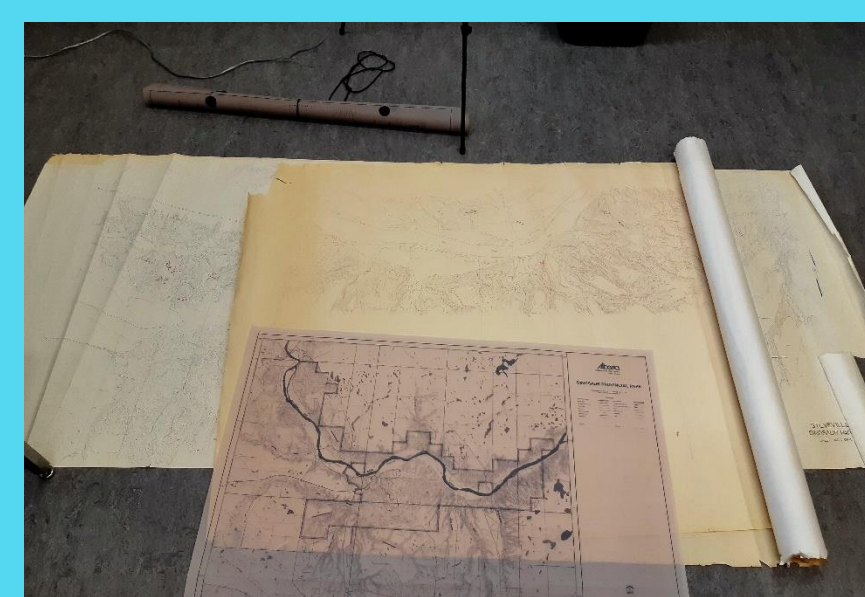


Figure 2: The small mylar map laid by an old paper map. The small map was used to match sections of paper maps with the corresponding mylar map (each mylar map depicts only a section of DPP).

- The corresponding mylar map was used to re-mark the points by matching the topography of the maps if the scale differed, or by overlaying the clear mylar map on the paper map to copy the points if the scales matched.

Figure 3: Mylar maps overlaying a paper map. The mylar maps were carefully matched to the paper maps and taped in place.



- Once all points were marked on the mylar maps, their coordinates were found by matching the lines on grid paper to the marks depicting longitude and latitude. A ruler was used to measure the distance from the line to each point.



Figure 4: A ruler being used to find a point's coordinates. 1 mm on the map represents 10 m in the park.

- The measured distance was either added or subtracted from the nearest line of longitude or latitude depending on placement, using the calculator app on a cell phone.
- The calculated coordinates were then recorded into a Google Spread Sheet.
- From there, the coordinates were entered and saved as pins into Google Earth Pro.

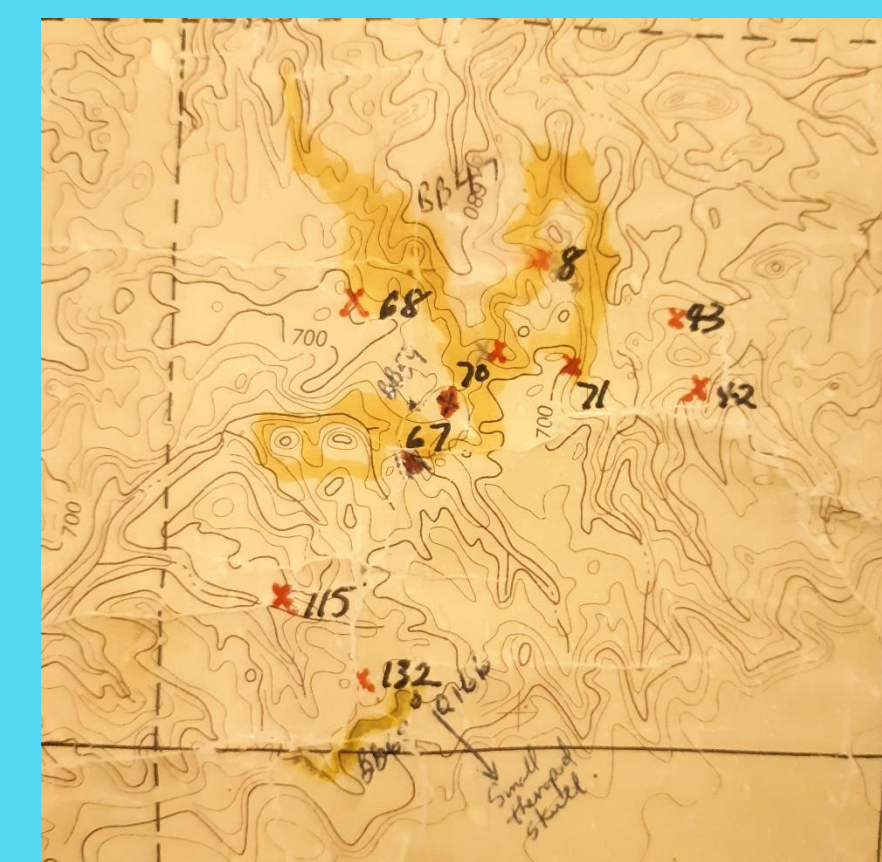


Figure 5: Step One: quarries on a paper map. The points on the original map.

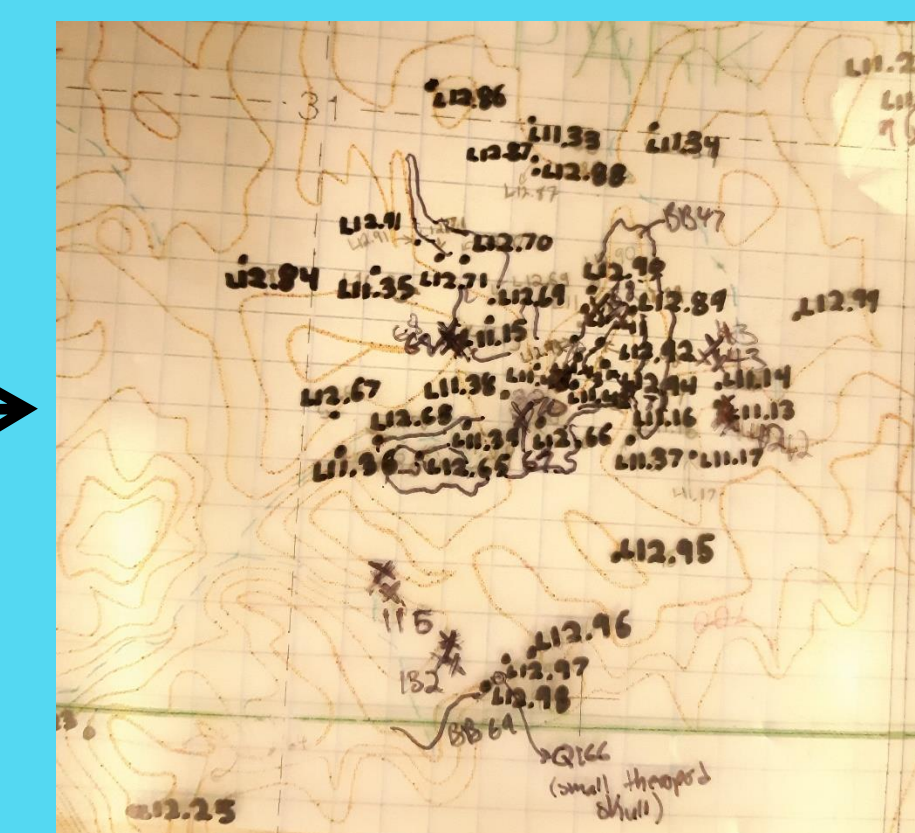


Figure 6: Step Two: quarries on a mylar map. The points have been transferred to the corresponding mylar map.

Point #	Coordinates	Notes
M11-179	WGS84 12 U 0477500 5628966	Done already
M11-210	WGS84 12 U 0477504 5629188	Done already
M12-133	WGS84 12 U 0477500 5628880	Done already
M12-182	WGS84 12 U 0476000 5626118	Done already
M12-193	WGS84 12 U 0476004 5625586	Done already
CP1947-45	WGS84 12 U 0469900 5623110	
CP1947-44	WGS84 12 U 0469900 5623110	
CP1947-43	WGS84 12 U 0469700 5621140	
CP1947-42	WGS84 12 U 0469700 5621140	
CP1947-41	WGS84 12 U 0469700 5621140	
CP1947-40	WGS84 12 U 0469700 5621140	
CP1947-39	WGS84 12 U 0469700 5621140	
CP1947-38	WGS84 12 U 0469700 5621140	
CP1947-37	WGS84 12 U 0469700 5621140	
CP1947-36	WGS84 12 U 0469700 5621140	
CP1947-35	WGS84 12 U 0469700 5621140	
CP1947-34	WGS84 12 U 0469700 5621140	
CP1947-33	WGS84 12 U 0469700 5621140	
CP1947-32	WGS84 12 U 0469700 5621140	
CP1947-31	WGS84 12 U 0469700 5621140	
CP1947-30	WGS84 12 U 0469700 5621140	
CP1947-29	WGS84 12 U 0469700 5621140	
CP1947-28	WGS84 12 U 0469700 5621140	
CP1947-27	WGS84 12 U 0469700 5621140	
CP1947-26	WGS84 12 U 0469700 5621140	
CP1947-25	WGS84 12 U 0469700 5621140	
CP1947-24	WGS84 12 U 0469700 5621140	
CP1947-23	WGS84 12 U 0469700 5621140	
CP1947-22	WGS84 12 U 0469700 5621140	
CP1947-21	WGS84 12 U 0469700 5621140	
CP1947-20	WGS84 12 U 0469700 5621140	
CP1947-19	WGS84 12 U 0469700 5621140	
CP1947-18	WGS84 12 U 0469700 5621140	
CP1947-17	WGS84 12 U 0469700 5621140	
CP1947-16	WGS84 12 U 0469700 5621140	
CP1947-15	WGS84 12 U 0469700 5621140	
CP1947-14	WGS84 12 U 0469700 5621140	
CP1947-13	WGS84 12 U 0469700 5621140	
CP1947-12	WGS84 12 U 0469700 5621140	
CP1947-11	WGS84 12 U 0469700 5621140	
CP1947-10	WGS84 12 U 0469700 5621140	
CP1947-9	WGS84 12 U 0469700 5621140	
CP1947-8	WGS84 12 U 0469700 5621140	
CP1947-7	WGS84 12 U 0469700 5621140	
CP1947-6	WGS84 12 U 0469700 5621140	
CP1947-5	WGS84 12 U 0469700 5621140	
CP1947-4	WGS84 12 U 0469700 5621140	
CP1947-3	WGS84 12 U 0469700 5621140	
CP1947-2	WGS84 12 U 0469700 5621140	
CP1947-1	WGS84 12 U 0469700 5621140	

Figure 7: Step Three: coordinates in a spread sheet. The coordinates of the 462 total points are calculated and recorded in a Google Spread Sheet.

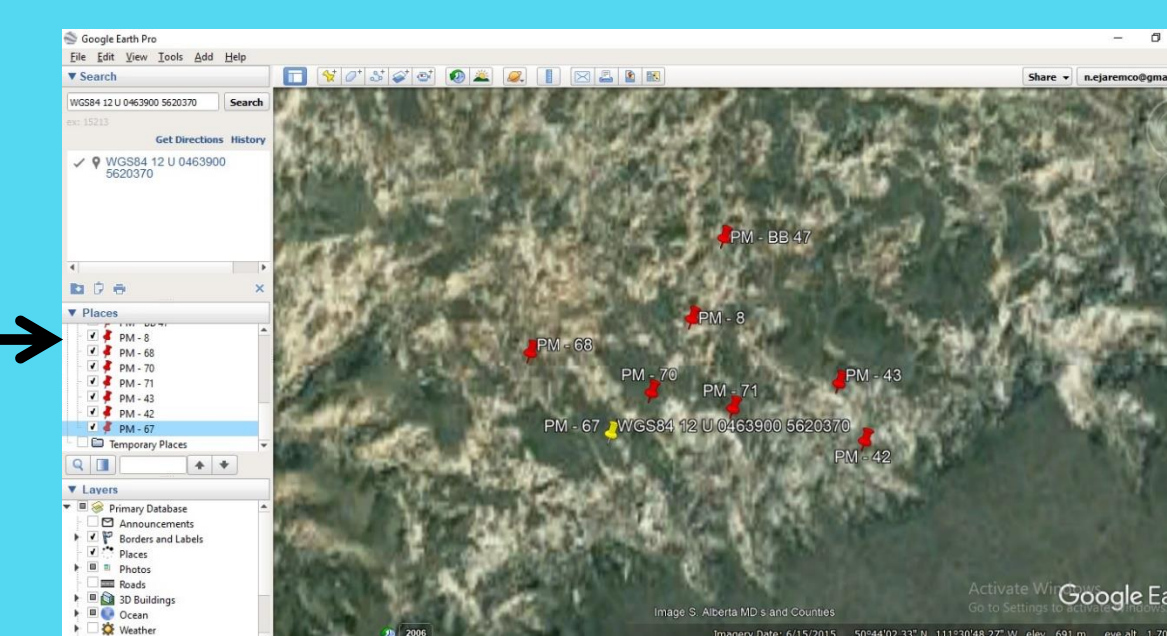
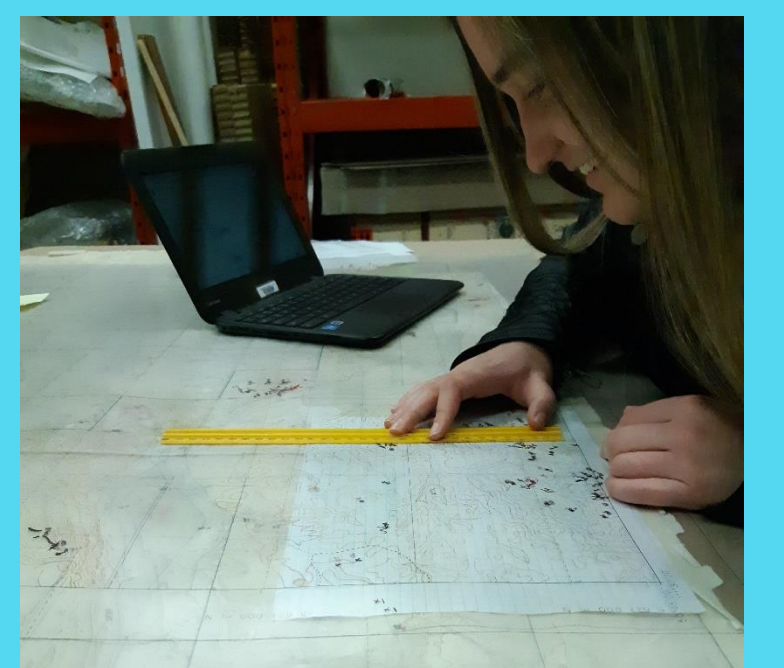


Figure 8: Step Four: quarries on Google Earth Pro. The points have been inputted and saved in Google Earth.

Discussion

- The points, having been uploaded to Google Earth, are much easier to access, no longer requiring the unrolling of massive, unwieldy maps. Instead they are easily viewed on a computer or cell phone.
- Points cannot be lost easily, as there is no physical copy to lose track of or damage.
- Some of the dig sites have not been accessed in many years, and once uploaded, it is simple to find their location, as Google Earth allows searches for specific locations.
- High erosion rates of 2 – 4 mm per year at DPP (Henderson and Tanke 2010) mean that some fossils will have entirely eroded away, while others have been uncovered. Some sites may have even been completely destroyed.

Figure 9: Working on the maps. This is the usual set up when finding and recording coordinates.



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