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Magnetic Exploration of the Crescent Formation, Washington: The search for a hidden fault near Dusk Point

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INVESTIGATION

- This study uses ground-based sampling and magnetic surveys along forest roads in the Olympic National Forest near Lake Wynoochee to locate a previously unmapped thrust fault, herein called the Dusk Point Fault (DPF).
- By determining anomalies in magnetic intensity and trace-element analysis in basalts, I hope to locate a boundary, representing the DPF, between the Crescent Thrust sheet and the Lower Crescent Unit

METHODOLOGY

- Using a Geometrics G-856 proton precession magnetometer, several traverses were completed along forest roads in search of magnetic intensity anomalies. Magnetic intensity data was recorded at stations every 10-25 feet. Two readings were recorded at each station for consistency. Readings were recorded at a base station at the start and end of each survey to allow for the correction of diurnal variation.
- Rock samples were collected to identify changes in trace-element compositions in the basalts that correspond to magnetic anomaly locations similar to or different from those identified by Ken Clark, who found that the Y/Nb ratios of the UC and CT were more enriched than the Y/Nb ratio of the LC
- Anomalies in the magnetic data were mapped and matched across separate traverses, tracing the path of the DPF

LOCATION MAP

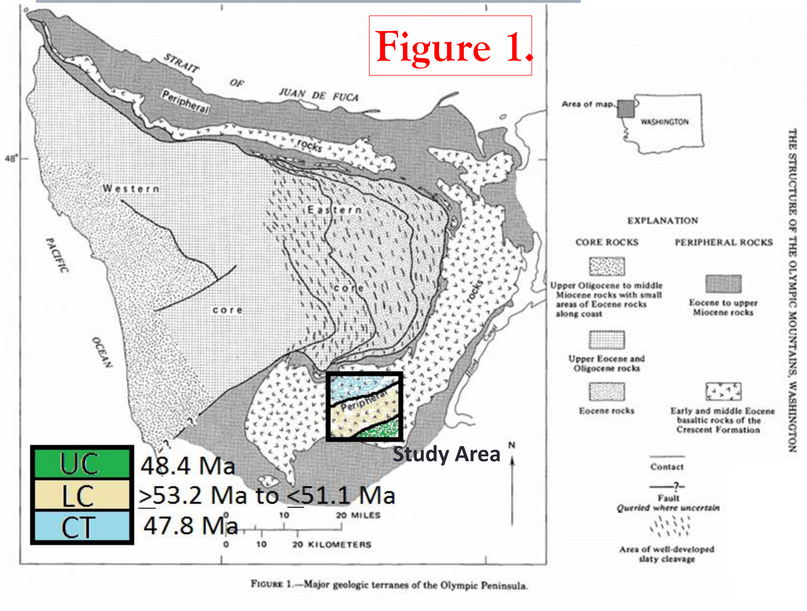

FIGURE 1.—Major geologic terranes of the Olympic Peninsula.

MAGNETIC TRANSECT MAP

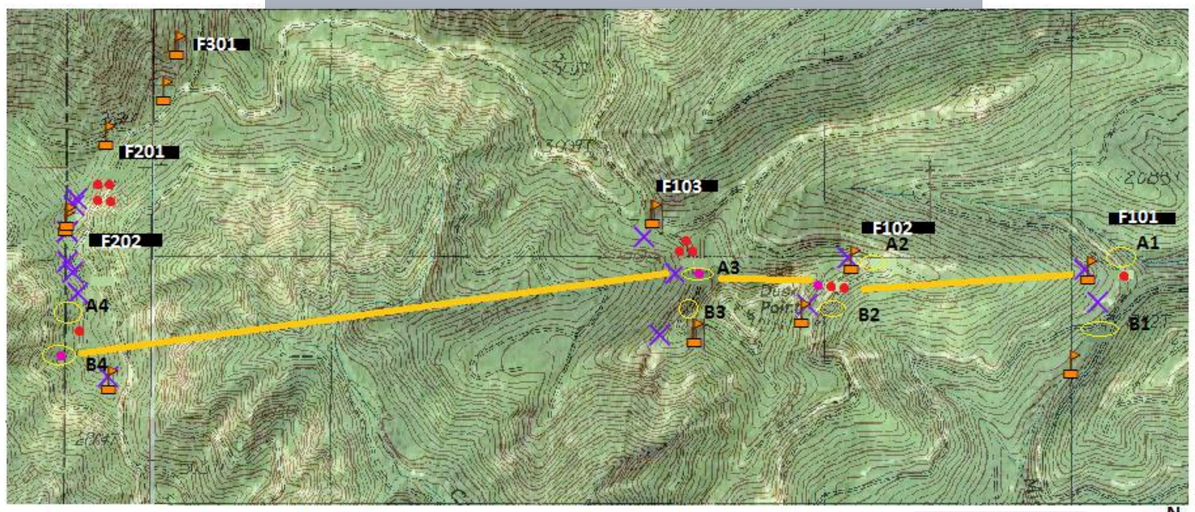

Figure 2.

MAGNETIC SURVEYS

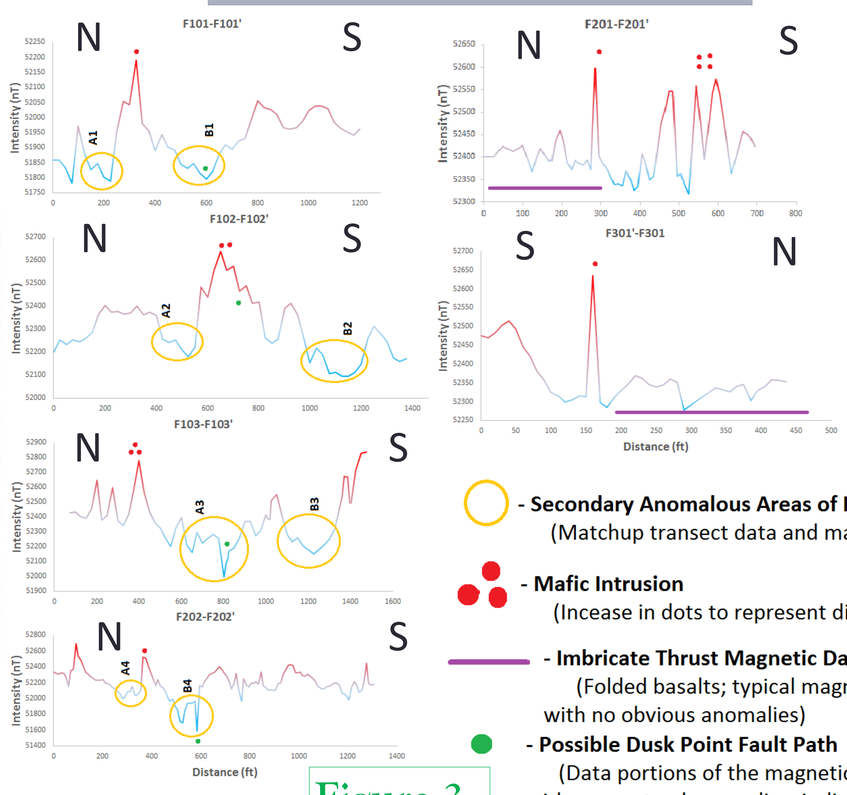

Figure 3.

OBJECTIVES

- Create magnetic profiles west of Dusk Point in order to locate the DPF
- Determine geochemical boundaries between the Lower Crescent and Crescent Thrust sheet
- Seek supporting evidence for the existence of a Dusk Point Fault and incorporate into the geologic history of the peninsula.

ACKNOWLEDGMENTS

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Figure 1. Olympic Peninsula map adapted from Tabor and Cady (1978). The black box represents the study area, also represented in Figure 2. Ages place older rocks atop younger rocks which is indicative of under-thrusting. UC-Upper Crescent, LC-Lower Crescent, CT-Crescent Thrust sheet. Age dates from Ken Clark.

Figure 2. Map of the Dusk Point area showing locations of magnetic surveys and geochemical samples. Displays the possible westward extent of an older, previously unrecognized fault in yellow. Also shown, by red dots, is the possible trace of a sill complex in the area which may have intruded the fault to an extent. Transects markers relate to Figure 3 magnetic data. (1km per square)

Figure 3. Magnetic Survey data taken from multiple road transects. F101, F102, F103, F201, F202, F301. Green dots represent a possible path of the DPF. Red dots mark the possible trace of a sill complex. Secondary Anomalous Areas of Interest are to matchup transect data in a side-by-side comparison. Purple Line shows what an area with relatively tame geologic history looks like.

CHEMISTRY DATA FOR SAMPLED ROCKS NOT YET AVAILABLE, COMING SOON. Look for future paper entitled: Magnetic Exploration of the Crescent Formation, Washington: Neogene Faulting and Chemistry of FR23

REFERENCES

Tabor, R. W., & Cady, W. M. (1978). *The structure of the Olympic Mountains, Washington: Analysis of a subduction zone* (Vol. 1033). US Govt. Print. Off.
Ken Clark, unpublished Abstract