

Dr. Dallas Sherman

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SUMMARY My work during graduate school focused on the application of marine electromagnetic methods. I was involved in the planning and execution of marine MT and CSEM surveys, as well as the subsequent data processing (assessing data quality, understanding its noise structure, and integrating navigation), inversion (using MARE2DEM), and interpretation. My work in industry involved planning, organizing, conducting, processing, analyzing and interpreting varied geophysical surveys for mining exploration, civil, geotechnical and environmental engineering.

EDUCATION *PhD*, Geophysics
Marine EM Lab, Steven Constable as advisor
Scripps Institution of Oceanography (SIO), La Jolla, CA, March 2018

Bachelor of Science, Environmental Engineering
University of California, San Diego, La Jolla, CA, June 2012

PROFESSIONAL EXPERIENCE Geophysicist, Frontier Geosciences Inc. Aug. 2018 - present
Staff research assistant, SIO Apr. - Aug. 2018
Independent contractor for Ocean Floor Geophysics, Japan Sept. - Oct. 2017
Marine operations committee, SIO Sep. 2016 - Jun. 2017
Graduate research assistant, SIO Aug. 2012 - Mar. 2018

RESEARCH INTERESTS Application of marine EM methods to exploration, including offshore groundwater. Using marine MT and CSEM data to map seafloor geology. Noise in marine MT data and stability of MT transfer functions. Degradation of subsea Arctic permafrost and its associated gas-hydrate. Integration of seismic and EM data sets.

PUBLICATIONS Attias, E., S. Constable, D. Sherman, K. Ismail, C. Shuler, and H. Dulai, 2021: Marine electromagnetic imaging and volumetric estimation of freshwater plumes offshore Hawai'i. *Geophys. Res. Lett.*, **48** 7

Attias, E., D. Thomas, D. Sherman, K. Ishmail, and S. Constable, 2020: Marine electrical imaging reveal novel freshwater transport mechanism in Hawai'i. *Sci. Adv.*, **6** 48.

Sherman, D. and S. Constable: Permafrost extent on the Alaskan Beaufort shelf from surface-towed controlled-source electromagnetic survey, *J. Geophys. Res. Solid Earth*, **123**

Sherman, D., P. Kannberg, and S. Constable, 2017: Surface towed electromagnetic system for mapping of subsea Arctic permafrost. *Earth Planet. Sci. Lett.*, **460** 97-104.

COMPUTER SKILLS MATLAB ◦ Fortran ◦ Unix ◦ MARE2DEM ◦ Illustrator ◦ LaTeX ◦ Surfer ◦ Python ◦ Paraview ◦ Seismic Unix ◦ Kingdom Suites ◦ Rayfract ◦ Res3DInv

OUTREACH & TEACHING Library NeXT classes periodically, 2016 - 2018
Sally Ride Summer Science Camp summers of 2015, 2016
Peer Mentor Sept. 2013 - June 2014
Teaching Assistant Spring Quarter 2011

CERTIFICATES First Aid OFA Level 1 with transportation endorsement ◦ Worksafe BC seismic blaster
◦ Ministry of Mines seismic blaster ◦ WHIMS 2015 ◦ Mine Supervisor ◦ NEXUS ◦ PADI
Advanced Open Water

MARINE EM PROJECTS *New Zealand Subduction zone MT and CSEM survey* Dec. 2018 - Jan. 2019
Survey across subduction zone offshore New Zealand to investigate effect of pore fluids
on subduction mechanics. Chief Scientist was Samer Naif at Lamont-Doherty Earth
Observatory.

- 30 days at sea, deep-towed CSEM and marine MT data collected

Kona, Hawai'i offshore groundwater CSEM survey Sept. 2018
Surface-towed controlled-source electromagnetic survey to investigate offshore ground-
water extent and structure offshore Kona, Hawai'i. Chief Scientist was Eric Attias with
University of Hawai'i at Mānoa.

- 7 days, 12 hour ops, surface-towed CSEM data collected

Japanese gas hydrate survey Sept. - Oct. 2017
Mapping hydrate targets offshore Japan, data is proprietary.

- 40 days at sea, deep-towed CSEM data collected
- Independent contractor hired by Ocean Floor Geophysics as part of the team
collecting and processing CSEM data.

Gulf of Mexico July 2017
Cruise to map various hydrate targets in the Gulf of Mexico. Chief Scientist was Steven
Constable with SIO.

- 14 days at sea on the R/V Point Sur, deep-towed CSEM data collected

Okmok Volcano June, July 2015
Cruise to image magma chamber beneath Okmok volcano, Aleutian Islands using mag-
netotelluric (MT) methods. Chief Scientist was Kerry Key with SIO.

- 4 day deployment leg on the R/V Thompson, 50 MT instruments deployed
- 7 day recovery leg on the R/V Siquiliak, MT instruments recovered

Prudhoe Bay July 2014 & Aug. 2015
Survey to map edge of subsea permafrost off the north coast of Alaska, funded by the
Department of Energy (D.O.E.). I processed and inverted this data for my dissertation.
Chief Scientist was Steven Constable with SIO.

- Small boat, R/V Ukpik, surface-towed CSEM data collected
- Seven 12-hour days in 2014 and ten 12-hour days in 2015

Uruguay Jan. - Feb. 2014
Using Magnetotellurics (MT) as an aid to frontier oil exploration, funded by British
Gas (BG). I processed and inverted this data. Chief Scientist was Steven Constable
with SIO.

- Over 30 continuous days at sea, 24 hour operations on the R/V Ocean Stalwart
- Over 150 MT sites and deep-towed CSEM data collected

San Nicolas Basin Dec. 2011
Test cruise looking for hydrate offshore California. I processed and inverted the MT
data. Chief Scientist was Steven Constable with SIO.

- Seven days of 24 hour operations on the R/V New Horizon
- MT sites and deep-towed CSEM data collected

**INDUSTRY
FIELD
PROJECTS**

Seismic Refraction Surveys Using Explosives

Seismic Refraction surveys conducted to establish depth to bedrock at potential dam sites, stormwater storage sites, tailings storage areas, and spoils storage areas.

Turnagain, Dease Lake, BC (November 2021); Cornwall Creek FSR, Cache Creek, BC (October 2021); Malmberg Deposit, Greenland (August 2021); Kicking Horse Pass, Golden, BC (October 2020); Red Chris Mine, BC (January 2020); Copper Mountain, Princeton, BC (September 2019); Sweetheart Lake, Juneau, AK (September 2018); Butte, MT, USA (June 2018)

Seismic Reflection Surveys Using Explosives

Seismic reflection survey conducted to characterize geologic structure, further exploration initiatives, and identify likely groundwater pathways.

Teck Coal Mountain Operations, BC (July 2022); Line Creek Operations, BC (July 2020); Brucejack Mine, BC (August 2018)

Seismic Surveys Using Percussive Firing Rod

Seismic refraction surveys conducted to define depth to bedrock and characterize overburden at future dam sites, tailings facilities, pipeline crossing, and spoils storage areas.

Kettle River, BC (August 2020); Flin Flon, MB (June 2020); Ridley Island PRPA, Prince Rupert, BC (February 2020); Greens Creek Mine, Juneau, AK (November 2019); Kemano T2 Project, Kemano, BC (May 2019); Kwanika, BC (October 2018)

3D Induced Polarization Surveys

Design, collection, and analysis of 3D Induced Polarization data performed to establish targets for mineral exploration drilling.

Nechako Claim, Vanderhoof Area, BC (August 2020); Brucejack Mine, BC (August 2018, 2019)

Electrical Resistivity Tomography (ERT) Surveys

ERT surveys conducted to highlight any gravel patches that may interfere with directional drilling and to characterize overburden.

Canal Flats, BC (May 2020); Golden Ears, BC (June 2019); Kemano T2 Project, Kemano, BC (May 2019); Mud Bay, BC (March 2019); Butte, MT, USA (June 2018)

Ice Radar survey

Determining depth to bedrock through glacial ice at discrete points from ground level. Malmberg Deposit, Greenland (August 2021); Brucejack Mine, BC (August 2019)

Sub-bottom Acoustic Profiling and Bathymetry Surveys

Bathymetry and sub-bottom acoustic profiling surveys conducted to establish depth to bedrock in shallow water prior to infrastructure development.

Esquimalt, BC (February 2022); Pearse Island, BC (November 2021); White Rock, BC (April 2019); Prince Rupert, BC (June 2019, November 2018)

GPR Surveys

Rough terrain GPR survey of forest service roads looking for voids, buried timber, and shallow bedrock.

Pearse Island, BC (November 2021); Castle Mountain, Elkview, BC (September 2020); Campbell River, BC (February 2019); Victoria, BC (June 2019)

Acoustic and Optical Televiwer

Televiwer surveys to aid in geotechnical drilling on mind life extension and reclamation projects.

Highland Valley Copper Mine, BC (August/September 2021); Quesnel River Mine, Wells, BC (January 2021); Stewart, BC (September 2020); Ridley Island PRPA, Prince Rupert, BC (February 2020); Gibraltar Mine, BC (October 2019)

Marine Seismic Refraction

Shallow water marine refraction carried out with a hydrophone cable and airgun to map depth to bedrock for port installations and dam structures.

Esquimalt, BC (February 2022); Pearse Island, BC (November 2021); Pacific Coast Terminals, BC (April 2021); Ridley Island PRPA, Prince Rupert, BC (February 2020); Lost Lagoon, Vancouver, BC (October 2019); Skeena Overwater, Prince Rupert, BC (February 2020)

MASW Surveys

Multichannel Analysis of Surface Waves (MASW) surveys conducted to characterize overburden by shear wave velocity.

Flin Flon, MB (June 2020); Greens Creek Mine, Juneau, AK (November 2019)