

David F. Porter

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Education

Ph.D., December 2011: “Implications of a reduced sea ice cover on the large-scale atmospheric energy and moisture budgets”, Atmospheric and Oceanic Science, University of Colorado, Boulder, Colorado.

M.S., May 2009, Atmospheric and Oceanic Science, University of Colorado, Boulder, Colorado.

B.S. with honors, May 2006, Major in Meteorology, Minor in Marine Science; Rutgers, The State University of New Jersey, New Brunswick, New Jersey.

Professional Employment

Associate Research Scientist, Lamont-Doherty Earth Observatory, Columbia University, Palisades, NY, 2015 to present

Postdoctoral Research Scientist, Lamont-Doherty Earth Observatory, Columbia University, Palisades, NY, 2012 to 2015

Postdoctoral Research Assistant, Cooperative Institute for Research in Environmental Sciences (CIRES), University of Colorado, Boulder, CO, 2012

Publications

Porter, D. F. et al., Deep pathway for ocean heat in NW Greenland discovered by bottom-up partnership with Kullorsuaq community, *in preparation for GRL*.

Porter, D. F., L. Padman, S. Springer, H. A. Fricker, R. Bell, Bathymetry Drives Localized Basal Melting along Suture Zones of the Ross Ice Shelf, *in preparation for GRL*.

Porter, D. F., P. M. Alexander, M. Tedesco, Sensitivity of snow pack and firn evolutions in the MAR-L offline model, *in preparation for Journal of Advances in Modeling Earth Systems*.

Purnell, D. J., Gomez, N., Minarik, W., **Porter, D.**, and Langston, G.: Precise water level measurements using low-cost GNSS antenna arrays, Earth Surf. Dynam. Discuss. [preprint], <https://doi.org/10.5194/esurf-2020-108>, in review, 2021.

Constantino, R. R., Tinto, K. J., Bell, R. E., **Porter, D. F.**, & Jordan, T. A. (2020). Seafloor depth of George VI Sound, Antarctic Peninsula, from inversion of aerogravity data. *Geophysical Research Letters*, 47, e2020GL088654. <https://doi.org/10.1029/2020GL088654>

Jordan, T. A., **Porter, D.**, Tinto, K., Millan, R., Muto, A., Hogan, K., Larter, R. D., Graham, A. G. C., and Paden, J. D.: New gravity-derived bathymetry for the Thwaites, Crosson, and Dotson ice shelves revealing two ice shelf populations, *The Cryosphere*, 14, 2869–2882, <https://doi.org/10.5194/tc-14-2869-2020>, 2020.

Tinto, K. J. et al. (2019), Ross Ice Shelf response to climate driven by the tectonic imprint on seafloor bathymetry, *Nature Geoscience*, 115, 2022, doi:10.1017/S0022143000005633.

Porter, D. F., S. R. Springer, L. Padman, H. A. Fricker, K. J. Tinto, S. C. Riser, R. E. Bell, the ROSETTA-Ice Team (2019), Evolution of the Seasonal Surface Mixed Layer of the Ross Sea, Antarctica, Observed With Autonomous Profiling Floats, *J. Geophys. Res.*, 11(1), 1, doi:10.1175/2011JPO4516.1.

Porter, D. F., K. J. Tinto, A. L. Boghosian, B. M. Csatho, R. E. Bell, and J. R. Cochran (2018), Identifying Spatial Variability in Greenland's Outlet Glacier Response to Ocean Heat, *Front. Earth Sci.*, 6, doi:10.3389/feart.2018.00090.

Nitsche, F. O., **D. Porter**, G. Williams, E. A. Cougnon, A. D. Fraser, R. Correia, and R. Guerrero (2017), Bathymetric control of warm ocean water access along the East Antarctic Margin, *Geophys. Res. Lett.*, 44, 8936–8944, doi:10.1002/2017GL074433.

Boghosian, A., K. Tinto, J. R. Cochran, **D. Porter**, S. Elieff, B. L. Burton, and R. E. Bell (2015), Resolving bathymetry from airborne gravity along Greenland fjords, *Journal of Geophysical Research: Solid Earth*, 120(12), 8516–8533, doi:10.1002/2015JB012129.

Porter, D. F., K. J. Tinto, A. Boghosian, J. R. Cochran, R. E. Bell, S. S. Manizade, and J. G. Sonntag (2014), Bathymetric control of tidewater glacier mass loss in northwest Greenland, *Earth and Planetary Science Letters*, 401, 40–46, doi:10.1016/j.epsl.2014.05.058.

Porter, D. F., J. J. Cassano, and M. C. Serreze, 2012: Local and large-scale atmospheric responses to reduced Arctic sea ice and ocean warming in the WRF model, *J. Geophys. Res.*, 117, D11115, doi:10.1029/2011JD016969.

Porter, D. F., J. J. Cassano, and M. C. Serreze (2011), Analysis of the Arctic atmospheric energy budget in WRF: A comparison with reanalyses and satellite observations, *J. Geophys. Res.*, 116, D22108, doi:10.1029/2011JD016622.

Porter, D. F., J. J. Cassano, M. C. Serreze, and D. N. Kindig, 2010: New estimates of the large-scale Arctic atmospheric energy budget, *J. Geophys. Res.*, 115, D08108, doi:10.1029/2009JD012653.

Non-peer reviewed publications:

Porter, D.F., 2011: Implications of a reduced Arctic sea ice cover on the large-scale atmospheric energy and moisture budgets. [Doctoral Thesis](#), University of Colorado at Boulder, Department of Atmospheric and Oceanic Science.

Porter, D.F., 2008: A New Estimate of the Large Scale Arctic Energy Budget. [Comprehensive Exam II](#), University of Colorado at Boulder, [Department of Atmospheric and Oceanic Science](#).

Funded Proposals

Kirsty Tinto, **David F. Porter**, Atsuhiko Muto, Robin Bell, Awarded August 2020.

“Collaborative Research: Building Geologically Informed Bed Classes to Improve Projections of Ice Sheet Change”, NSF - Antarctic.

Robin Bell, Kirsty Tinto, Jackie Austermann, **David F. Porter**, Jonny Kingslake, Awarded September 2019. "Greenland Rising – Predicting Change in Shallow Water Arctic Environments", NSF Navigating the New Arctic (NNA) – Track 1.

David F. Porter, Chris Zappa, Robin Bell, Awarded October 2014. "Using Image Velocity Techniques to Measure the Turbulent Flow of Sediment Plumes in West Greenland", Climate Center Innovative Research Proposal.

Robin Bell, Margie Turrin, **David F. Porter**, Billy D'Andrea. Awarded October 2014. "Climate Science and Building a Plan for a Greenland P.I.R.E.", Climate Center Innovative Research Proposal.

David F. Porter, Kirsty Tinto, Robin Bell, Awarded June 2013. "New measurements of water temperatures and seafloor depths using XBTs in a northwest Greenland fjord", Climate Center Innovative Research Proposal.

Field Experience

January 2020: Nuuk, Greenland for NSF Navigating the New Arctic (NNA) project “Greenland Rising”. Met with local project collaborators, devised 2020 survey plan, visited R/V Sanna and Asiaq regarding multibeam from small boats, and hosted an LDEO Glaciology table at “Culture Night”

October – November 2019: Hobart, Tasmania, Australia for the NASA Operation IceBridge. Gravity team as lead of design, integration, and collection of airborne gravity data from the Lamont Gravimeter Suite on Gulfstream V flights over Antarctica.

January - February 2019: Thwaites Glacier for ITGC Aerogeophysical Survey aboard British Antarctic Survey Twin Otter. Science Lead, gravity operator, flight planning, weather forecasting, data quality control and archive.

October-November 2018 – Punta Arenas, Chile and Ushuaia, Argentina for the NASA Operation IceBridge. Gravity team for collection and processing of airborne gravity data from the Sanders Geophysics AIRGrav system on DC-8 flights over Antarctica.

October -December 2017 – McMurdo, Antarctica for year three of the ROSETTA-ICE project. Primary gravimeter operator, technician, and QC analyst. Primary backup for the operation of the IcePod. Oversaw re-deployment and cargo movement while in McMurdo.

March 2017 – Thule Air Force Base, Greenland for the NASA Operation IceBridge. LDEO team to test newly acquired gravimeters for suitability of use for draped flights in Greenland. Lead gravimeter operator. NASA P3 air crew to integrate gravimeters, collect a combination new and repeat gravity measurements from 8 flights.

November-December 2016 – McMurdo, Antarctica for the ROSETTA-ICE project. A gravimeter specialist and operator, plane surveyor, and ocean observation lead. Assisted in the operation of the IcePod and on several flights. Worked with NYANG 109th Airwing to acquire certification and eventually deploy of 6 air-launched autonomous oceanographic observing

November-December 2015 – McMurdo, Antarctica. A field team member of the ROSETTA-ICE project. Primary data archive specialist and member of quality control team. Nightshift magnetometer and GPS base station operator. Assisted in the operation of the IcePod and gravimeters on several flights. Other activities include weather forecasting and interpretation of reports from weather office, surveying of the plane for gravimeter installation, and videographer.

March-May 2015 – East Antarctica/Totten Glacier. Managed CTD, ADCP, and water sample operations aboard a 42 day cruise to the Banzare/Sabrina Coast on the RVIB Nathaniel B. Palmer with PI F. Nitsche to investigate the susceptibility of the EAIS to oceanic changes.

July 2014 – Kullorsuaq, Greenland. Worked with local fisherman and schoolteachers to make CTD casts from a small boat near Alison Glacier. PI and logistical coordinator.

May 2014 – Hudson River, Tested CTD winch operation aboard RiverKeeper vessel

Professional Experience

Associate Research Scientist under supervision of Drs. Robin Bell and James Cochran at the Lamont-Doherty Earth Observatory of Columbia University in Palisades, NY. August 2012 to present

NYC Dept. of Education and NY Academy of Sciences “Scientist-in-Residence” at NEST+M for School Year 2019/2020 with 7th grade science teachers Stephen Kos and Karol Petreshock for year-long project title “How the ocean and atmosphere affects ice sheet change.”

Primary Instructor for Secondary School Field Research Program (SSFRP) Data Analysis Course, with Robert Newton, LDEO. Summer 2016 and 2017.

Participation of NOAA/National Geodetic Survey “Airborne Gravity for Geodesy” Summer School, May 2016.

Postdoctoral Research Assistant under supervision of Professor John Cassano, Cooperative Institute for Research in Environmental Sciences (CIRES), University of Colorado, Boulder, CO, 2012.

Graduate Research Assistant under [Professor John Cassano](#) of the Atmospheric and Oceanic Sciences Department ([ATO](#)) and CIRES at the University of Colorado at Boulder and [Dr. Mark Serreze](#), Director of the National Snow and Ice Data Center ([NSIDC](#)) in Boulder, Colorado; May 2007 to December 2011.

Recent reviewer of several journal articles for the Journal of Climate, Climate Dynamics, and Geophysical Research Letters, Frontiers of Geoscience

Passed the National Agency Check (NAC) in order to gain access to Dept. of Defense supercomputers at the Arctic Regional Supercomputing Center. Gained much experience running long, customized WRF simulations on HPC systems.

Independent Study: Creating and testing a 6-meter Weather Tower under Professor David Noone, May 2008 to May 2010.

MMM Semi-annual WRF Tutorial at NCAR, January 2009.

Teaching Assistant (Instructor of Record) for two simultaneous sections, Atmospheric and Oceanic Sciences 1070: Weather and the Atmosphere Laboratory; Fall 2006, Spring 2007, Fall 2011.

Presentations

Talks

Austermann, J., **Porter, D. F.**, et al., February 2021, “Greenland Rising” Building Resilient Communities, Graduate School of Architecture, Planning and Preservation – Columbia University, NY, NY

Porter, D. F. and Antwerpen, R. M., Jan 2021, “Sea Level Changes Around Greenland: Paleo, Processes, and People”, NASA GISS Sea Level Rise Seminar Series, NY, NY

Porter, D. F., 2020, “Tide gauge locations and ocean dynamics in Greenland rising”, Greenland Rising – Sea Level Meeting, Virtual (LDEO)

Porter, D. F., 2020, “Tide gauges in Greenland for NNA Project *Greenland Rising*”, Greenland Institute for Natural Resources (GINR), Nuuk, Greenland

Porter, D. F., and C. Robinson, 2019. “Thwaites AeroSurvey: Phase One of the ITGC”, Rothera Research Station, *Science Seminar*, British Antarctic Territory, Antarctica

Porter, D.F., 2018: Exploring Atmospheric Drivers of Surface Melt with Weather Models. Antarctic Surface Hydrology Workshop, LDEO, Columbia Univ., Palisades, NY.

Porter, D.F., 2018. By Air and by Sea: Observations near Ice Shelves made with Autonomous Profiling Floats, AGU Ocean Sciences Meeting, Portland, OR.

(Invited) Porter, D.F., 2017. Measuring Ocean Variability near Ice Shelves with Autonomous Profiling Floats, WAIS Workshop, Coupville, WA.

Porter, D.F., 2016: IGNITE-IGS. Teaching salty dogs new tricks: advancing Southern Ocean science with innovative methods, IGS Ice-Ocean Symposium, La Jolla, CA.

Porter, D.F., K. Tinto, I. Das, 2015: ROSETTA – The Ross Ice Sea from Top to Bottom. Wednesday Science Lecture, McMurdo Station, Antarctica.

Porter, D.F., 2015: An Introduction to Alison Glacier (by the people of Kullorsuaq). GrIOOS Meeting, SEARCH, San Francisco, CA.

Porter, D.F., 2015: Spatial patterns of glacial change in Greenland. PARCA Meeting, NASA GSFC, Greenbelt, MD.

Porter, D.F., 2014: Fjord geometry controls on basal melt and glacier mass loss in Greenland. Subglacial Hydrology Workshop, LDEO, Columbia Univ., Palisades, NY.

Porter, D.F., 2014: Bathymetric controls on basal melt and glacier mass loss in Greenland. PARCA Meeting, NASA GSFC, Greenbelt, MD.

Porter, D.F., 2013: Bathymetric controls on observed tidewater glacier retreat in Northwest Greenland. GRISO meeting, Beverly, MA.

Porter, D.F., 2012: Local and large-scale atmospheric responses to reduced Arctic sea ice and ocean warming in the WRF model. MGG/SGT seminar, LDEO, Columbia University, Palisades, NY.

Porter, D.F., 2011: Implications of a reduced sea ice cover on the large-scale atmospheric energy and moisture budgets. Dissertation Defense, University of Colorado at Boulder Department of Atmospheric and Oceanic Science, Boulder, CO.

Porter, D.F., J.J. Cassano, M.C. Serreze, 2011: Characterizing the sensitivity of WRF to a reduced sea ice cover. Polar Meeting of the American Meteorological Society (AMS), Boston, MA

Porter, D.F., J.J. Cassano, M.C. Serreze, 2009: Analysis of the Arctic Energy Budget in WRF: a comparison with reanalyses and satellite observations. American Geophysical Union (AGU) 2009 Fall Meeting, San Francisco, CA

Porter, D.F., 2008: A New Estimate of the Large Scale Arctic Energy Budget. [Comprehensive Exam II](#), University of Colorado at Boulder Department of Atmospheric and Oceanic Science, Boulder, CO.

Posters

Porter, D.F., L. Padman, S. Springer, December, 2020: Poster. American Geophysical Union (AGU) 2020 Fall Meeting, Virtual.

Porter, D. F., P. M. Alexander, L. Dong, X. Fettweis, M. Tedesco, December 2020: Poster. Program for Arctic Regional Climate Assessment – NASA GSFC, Greenbelt, MD.

Porter, D.F., L. Padman, S. Springer, December, 2020: Poster. American Geophysical Union 2020 Ocean Sciences Meeting, San Diego, CA.

Porter, D. F., Austermann, J., Kingslake, J., Tinto, K., Bell, R., December, 2020: Poster. American Geophysical Union 2020 Ocean Sciences Meeting, San Diego, CA.

Porter, D. F., K. J. Tinto, C. Locke, J. R. Cochran, December 2019: Poster. American Geophysical Union (AGU) 2019 Fall Meeting, Washington D.C.

Porter, D. F., P. M. Alexander, L. Dong, X. Fettweis, M. Tedesco, December 2018: Poster. American Geophysical Union (AGU) 2018 Fall Meeting, Washington D.C.

(Invited) Porter, D. F., K. J. Tinto, C. Dieck-Locke, J. Berry, August, 2018: Poster. West Antarctic Ice Sheet (WAIS) 2018 Workshop, Stony Point, NY.

Porter, D.F. et al., 2018: January, 2018: Poster. Program for Arctic Regional Climate Assessment – NASA GSFC, Greenbelt, MD.

Porter, D.F., L. Padman, S. Springer, December, 2017: Poster. American Geophysical Union (AGU) 2017 Fall Meeting, New Orleans, LA.

Porter, D. F., K. J. Tinto, C. Dieck-Locke, October, 2017: Poster. West Antarctic Ice Sheet (WAIS) 2017 Workshop, Coupville, WA.

Porter, D.F., A. Boghosian, K. Tinto, J. Cochran, B. Csatho, R. Bell, December, 2015: Poster. American Geophysical Union (AGU) 2015 Fall Meeting, San Francisco, CA.

Porter, D.F., M. Turrin, S. Greve, R. Bell, June, 2015: Poster. Ilulissat Climate Days/SVALI 2015 Meeting, Ilulissat, GL.

Porter, D.F., M. Turrin, S. Greve, R. Bell, December, 2014: Poster. American Geophysical Union (AGU) 2014 Fall Meeting, San Francisco, CA.

Porter, D.F., A. Boghosian, K. Tinto, J. Cochran, R. Bell, December, 2013: Poster. American Geophysical Union (AGU) 2013 Fall Meeting, San Francisco, CA.

Porter, D.F., A. Boghosian, K. Tinto, J. Cochran, R. Bell, 2013: January, 2013: Poster. Program for Arctic Regional Climate Assessment – NASA GSFC, Greenbelt, MD.

Porter, D.F., A. Boghosian, K. Tinto, J. Cochran, R. Bell, 2013: December, 2012: Poster. American Geophysical Union (AGU) 2011 Fall Meeting, San Francisco, CA.

Porter, D.F., J.J. Cassano, M.C. Serreze, 2011: Implications of a reduced sea ice cover on the large-scale atmospheric energy and moisture budgets, December, 2011: Poster. American Geophysical Union (AGU) 2011 Fall Meeting, San Francisco, CA.

Porter, D.F., 2010: Characterizing the sensitivity of Arctic circulation to sea ice changes, December, 2010: Poster. 2010 Atmospheric and Oceanic Sciences Student Poster Conference at the University of Colorado at Boulder, Boulder, CO.

Porter, D.F., 2009: Analysis of the Arctic Energy Budget in WRF: a comparison with reanalyses and satellite observations, November 2009: Poster. 2009 Atmospheric and Oceanic Sciences Student Poster Conference at the University of Colorado at Boulder, Boulder, CO.

Porter, D.F., J.J. Cassano, M.C. Serreze, 2008: A New Estimate of the Large Scale Arctic Energy Budget. Poster. American Geophysical Union (AGU) 2008 Fall Meeting, San Francisco, CA.

Porter, D.F., 2008: A New Estimate of the Large Scale Arctic Energy Budget, October, 2008: Poster. 2008 Atmospheric and Oceanic Sciences Student Poster Conference at the University of Colorado at Boulder, Boulder, CO.

Porter, D.F., 2007: The Arctic Energy Budget in the Japanese Reanalysis. November, 2007: Poster. 2007 Atmospheric and Oceanic Sciences Student Poster Conference at the University of Colorado at Boulder, Boulder, CO.

Service

- “Scientist-In-Residence” with the NYAS and NYCDOE for SY2020-21 at I.S 254 in Bronx, NY. Sent Glacier Goo kits to each student in two classes, made the glacier analog over zoom, and then performed 5 experiments over course of 12 classes (in addition to training, planning, introductions and backgrounds, and helping with final reports).

Mentor: Highschool student from Valley Stream North High School, Franklin Square, NY participating in 3 year SUNY Albany Science Research Program, 2020. This ongoing project is studying lobster behavior modification due to increased ocean temperatures as a cause for catch decline in Long Island Sound.

Mentor: Two Summer REUs: designing tide gauges for measuring water levels in Arctic environments, “What causes sea level to change near ice sheets?” Summer 2020. The paired students, one strong in computer science and the other in Earth science, decomposed observed sea level changes in the Arctic into individual drivers using tide gauges, GPS stations, and GIA models.

-Nuuk, Greenland: hosted LDEO Glaciology table at “Culture Night” for 10% of capital’s population, Jan. 2020

Mentor: Journey Berry, Academies of Englewood Highschool Intern, Summer/Fall of 2018, *Combining direct and remote measurements to understand sea floor in polar regions*, leading to AGU Poster submission

-STEM Series Career talk and glacier demonstration, Long Valley Middle School, March 2020

-“Scientist-In-Residence” with the NYAS and NYCDOE for SY2019-20 at NEST+M Academy in New York City. Subject included “How Climate Scientists Collect and Analyze Data”, following along with Antarctica field work and installing tide gauges in Greenland.

-Outreach participant with LDEO Hudson River Field Station, summer 2019 – Seining, fish identification, waer chemistry, history of the Hudson River Valley

-ITGC Antarctica Week presenter, 2018, 2019

-Games For Change: Arctic Game Jam – Organized and developed several education games about ice shelf, caribou migration, and climate adaptation, April 2017

-Women in STEM – Intrepid Museum, March 2017

-SUBMERGE - NYC Marine Science Festival, September 2016

-Presenter at Columbia University Data Science Institute Symposia: “Sea Level Rise and the Cryosphere, April 2016

- Judge at the annual 2016 Long Valley Junior Women's Club Science Fair, March 2016.
- Host of multiple Saturday Earth2Class workshops for educators about Sea Level Rise and the Cryosphere, utilizing the recently released interactive companion iPad and iPhone App, February and April 2016.
- Panelist for screening of Luc Hardy's film "On the Shoulder of Shackleton"; 71st UN Congress Program – Aug 2105, and French Embassy Feb 2016.
- Mentor for the Secondary School Field Research Summer Program at LDEO, Summer 2015.
- Hosted two classes of T.A.G. scholars at LDEO for half-day weather and snow demonstration, March 2015.
- AGU Fall Meeting OSPA Judge, 2014-2015
- Developed 3D printing routine for scientific data, e.g. topography/bathymetry and profile data
- Earth Institute Open House, October 2012, 2014, 2016, 2017 – Developed several new permanent ice-ocean interaction demonstrations and demonstrated flow of ice using borax analogue
- NASA Sun and Earth Day at American Museum of Natural History, NY, March 2014.
- Career Path Panelist at Rutgers University Meteorology Club meeting, March 2013
- Organizer of the weekly Marine Geology and Geophysics seminar at LDEO, August 2012-October 2013
- Helped organize and run the "Why is Greenland Melting" reading group at LDEO, Fall 2012
- Discussed past, present, and future, sea level rise at LDEO World Science Fair booth, Washington Square Park, NY, May 2013
- Serving on the ATOC Faculty Meeting, New Hire Search, Student Concerns and Social Committee for the Department of Atmospheric and Oceanic Sciences at the University of Colorado at Boulder, 2006-2011.
- National Ice Core Laboratory volunteer, Denver, Colorado; February, 2009 under Dr. Matthew Nolan.
- Roche Colorado Regional Science Fair Judge; February 26, 2009.
- AMS conference student assistant 2005, 2006.

Professional Affiliations

New York Academy of Sciences (NYAS), member since 2019
 American Meteorological Society (AMS), member since 2003
 American Geophysical Union (AGU), member since 2007

Skills

Linux, IDL, NCL, Python, Fortran, Matlab, HTML, weather models (WRF, MAR), ocean models (MITgcm, GOTM), coupled climate models (RASM, CESM), snow models (MAR-Offline), R, ArcGIS, Geosoft, Geoda, familiar with HPC environment and batch scheduling, shell scripting, ASA and SCUBA certified.

Hobbies

Banjo, guitar, and kora player, Biker, Telemark Skier, Sailor and Windsurfer, Sourdough baker and Zymurgist, Amigarumi Animator

Internal/External Collaborators

P. Alexander (LDEO/NASA GISS), J. Austermann (LDEO, DEES), A. Boghosian (LDEO), J. Cassano (CIRES), B. Csatho (U. Buffalo), H. A. Fricker (Scripps), S. Greve (Kullorsuup Atuarfissua), T. Jordan (BAS), J. Kingslake (LDEO), S. Manizade (NASA/WFF), F-O. Nitsche (LDEO), L. Padman (ESR), S. Riser (UW), M. Serreze (NSIDC), J. Sonntag (NASA/WFF), S. Springer (ESR), M. Tedesco (LDEO), K. Tinto (LDEO), G.-D. Williams (CSIRO), K. Zinglarsen (GINR)