

Notice to Research Vessel Operators No. 103

Subject: Forms Required for Requesting Authorization to Conduct Marine Scientific Research in Denmark and Greenland Waters.

Released by the Department of State, Bureau of Oceans and International Environmental and Scientific Affairs, April 16, 1993.

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Enclosed please find a copy of a form required by the Government of Denmark for requesting authorization to conduct marine scientific research in Danish jurisdiction, including Greenland. This form was developed as a result of a United Nations workshop held to investigate implementation of the relevant provisions of the UN Convention on Law of the Sea. Presently this document is required in addition to materials required by NTRVO No. 67. However, it is possible that at some later date, the Department of State will require the universal use of this document in lieu of the Cruise Prospectus form for all research vessel clearances. A NTRVO will be issued if, and when, this occurs.

Also there is a form which must be submitted in addition to other requirements for Denmark, if proposed research will be conducted in Greenland waters. Please contact the Research Vessel Clearance Officer at the Department of State to obtain this form, titled "Project Proposal/Data Sheet for U.S. Scientific Research in Greenland".

The stated prior notice requirement for research vessel clearance requests for Denmark is three months. Therefore, it is required that all requests be submitted to the Department of State at least four months prior to proposed research, and in compliance with the "UNOLS Handbook for International Operations of U.S. Scientific Research Vessels".

APPLICATION FOR CONSENT TO CONDUCT MARINE SCIENTIFIC RESEARCH IN AREAS UNDER NATIONAL JURISDICTION OF DENMARK

Date: February 21, 2003

1. GENERAL INFORMATION

1.1 Cruise name and/or number: HLY-03-01

1.2 Sponsoring institution:

Name: National Science Foundation

Address: 4201 Wilson Boulevard, Arlington, Virginia 22230, USA

Name of Director: Dr. Rita R. Colwell

1.3 Scientist in charge of the project:

Name: Dr. Kelly Kenison Falkner
Address: 104 Ocean Admin Bldg, COAS-OSU,
Corvallis OR 97331-5503 USA
Telephone: 541-737-3625
email: kfalkner@coas.oregonstate.edu
Telefax: 541-737-2064

1.4 Scientist(s) from Denmark involved in the planning of the project:

Name(s): Dr. Knud Falk
Address: Dansk Polar Center
Strandgade 100 H
DK-1401 Copenhagen K, Denmark
Phone +45 32880130 fax +45 3288 0101
email- kf@dpc.dk

1.5 Submitting officer:

David Forcucci
1519 Alaskan Way S
Seattle, WA 98134
Nationality: USA
Telephone: 206-217-6648 Fax: 206-217-6878
Email: Dforcucci@pacnorwest.uscg.mil

2. DESCRIPTION OF PROJECT (ATTACH ADDITIONAL PAGES AS NECESSARY)

2.1 Nature and objectives of the project:

The scientific goal of this research program is to determine the forcing and variability of seawater and ice fluxes through Nares St. Specific objectives of this cruise are to:

- 1) conduct CTD-rosette based tracer hydrographic sections in northern Baffin Bay and throughout Nares St to the Lincoln Sea
- 2) deploy 26 moorings in Nares St.-see attached figure for target placement
- 3) recover at least 4 long piston cores in the slope region just south of Bylot Island
- 4) retrieve bivalves from Nares St.
- 5) launch 48 XCTD's at locations near western Davis St. and between Lancaster Sound and Barrow.

2.2 Relevant previous or future research cruises:

The moorings will be retrieved and redeployed from the ice using aircraft early in the spring of 2005. They will be retrieved from the ice using aircraft early in the spring of 2003

2.3 Previously published research data relating to the project: None

3. METHODS AND MEANS TO BE USED

1. Particulars of vessel:

Name: USCGC Healy

Nationality (Flag state): USA

Owner: United States Coast Guard

Operator: United States Coast Guard

Overall length (meters): 128

Maximum draught (meters): 8.9

Displacement/Gross tonnage: 16,000 LT

Propulsion: Diesel Electric

Cruising & Maximum speed: 12knts & 15 knts

Call sign: NEPP

Method and capability of communication (including emergency frequencies): INMARSAT (A, B & C), UHF, HF, VHF, Iridium

Name of master: Captain Daniel Oliver

Number of crew: 75

Number of scientists on board: 35

2. Aircraft or other craft to be used in the project: HH-65 helicopter; Arctic Survey Boat

3. Particulars of methods and scientific instruments:

3.3 Particulars of methods and scientific instruments		
Types of samples and data	Methods to be used	Instruments to be used
Water samples-hydrography	CTD-rosette casts	Seabird CTD-911+SBE32 Carousel
Current profiling	ADCP's	75kHz and 150 kHz in-hull
Bottom mapping	Single and multi- beam echosounders	Bathy2000 Seabeam Swath Mapper
Long sediment cores (= 30 m)	Piston corer	Broda 30-m design
Moored current profiling	ADCP	RDI Workhorse LongRangers
Moored ice-draft profiling	ADCP	ASL ice sonars
Moored pressure sensors		Parascientific Digiquarz sensors
Moored conductivity-temp records	CT sensors	Seabird
Bi-valve shells	Divers	
Conductivity-temperature profiles	XCTD deployment	TSK-XCTD's

1. Indicate whether harmful substances will be used: No harmful substances will be released as part of science operations

2. Indicate whether drilling will be carried out: No drilling will be done

3. Indicate whether explosives will be used: No explosives will be used

4. INSTALLATIONS AND EQUIPMENT

Details of installations and equipment (dates of laying, servicing, recovery; exact locations and depth):

Summary of HLY-03-01 Cruise Plan with Target Station Locations

Location	Station	Lat dec degree N	Long dec degree W	Depth m	Activity	Es t Begin Date/Time
St. John's	depart	47.63	52.75			7/21/03 6:00
Cape Dyer	Waypoint	66.67	61.17	62	Doppler	7/25/03 17:44
Baffin Bay	central	72.73	67.22	2000	Begin section	7/26/03 21:13
	Baffin-W	72.33	74.44	2000	12 stn Rosette/CTD & Doppler	7/28/03 20:14
TBD	coring	72.33	74.44	1500	Piston cores	7/30/03 20:14
	central	72.73	67.22	2000	Doppler	7/31/03 7:15
	Baffin-N	75.93	67.22	2000	12 stn Rosette/CTD & Doppler	8/2/03 11:15
Baffin Bay	Waypoint	76.50	74.00		Transit	8/2/03 19:48
Smith Sound	S01	78.33	72.88	100	Rosette/CTD & Doppler	8/3/03 19:00
	S02	78.33	73.39	300	Rosette/CTD & Doppler	8/3/03 21:15
	S03	78.33	73.90	600	Rosette/CTD & Doppler	8/3/03 23:29
	S04	78.33	74.43	500	Rosette/CTD & Doppler	8/4/03 1:46
	S05	78.33	74.95	200	Rosette/CTD & Doppler	8/4/03 4:02
Kane Basin	P08	78.65	71.13	20	Mooring (pressure)+clams	8/4/03 17:55
	P03	78.90	75.53	20	Mooring (pressure)+clams	8/5/03 8:38
	Waypoint	78.90	75.00	180	Transit	8/5/03 9:52
	KS	79.68	71.00	225	Mooring (ADCP)	8/6/03 2:44
	P06	79.87	71.10	20	Mooring (pressure)+clams	8/6/03 8:05
	P05	80.13	67.10	20	Mooring (pressure)+clams	8/6/03 21:00
Kennedy Channel	K01	80.37	67.59	200	Mooring (SBE37)	8/7/03 2:59
	K01	80.37	67.59	200	CTD & Doppler	8/7/03 3:29
	K02	80.37	67.72	210	Mooring (ADCP)	8/7/03 6:44
	K02	80.37	67.72	210	Rosette/CTD & Doppler	8/7/03 7:44
	K03	80.39	67.82	240	Mooring (SBE37)	8/7/03 11:01
	K03	80.39	67.82	240	CTD & Doppler	8/7/03 11:31
	K04	80.40	67.92	290	Mooring (ADCP)	8/7/03 14:46
	K04	80.40	67.92	290	Rosette/CTD & Doppler	8/7/03 15:46
	K05	80.41	68.05	311	Mooring (SBE37)	8/7/03 19:04
	K05	80.41	68.05	311	CTD & Doppler	8/7/03 19:34
	K06	80.42	68.13	380	Mooring (ADCP)	8/7/03 22:48
	K06	80.42	68.13	380	Rosette/CTD & Doppler	8/7/03 23:48
	K03	80.43	68.25	380	Mooring (SBE37)	8/8/03 3:03
	K03	80.43	68.25	380	CTD & Doppler	8/8/03 3:33
	K08	80.45	68.37	380	Mooring (ADCP)	8/8/03 6:50
	K08	80.45	68.37	380	Rosette/CTD & Doppler	8/8/03 7:50
	K09	80.46	68.50	303	Mooring (SBE37)	8/8/03 11:08
	K09	80.46	68.50	303	CTD & Doppler	8/8/03 11:38
	K10	80.47	68.63	303	Mooring (ADCP)	8/8/03 14:56
	K10	80.47	68.63	303	Rosette/CTD & Doppler	8/8/03 15:56
	K11	80.48	68.75	303	Mooring (SBE37)	8/8/03 19:13
Location	Station	Lat dec degree N	Long dec degree W	Depth m	Activity	Es t Begin Date/Time
	K11	80.48	68.75	303	CTD & Doppler	8/8/03 19:43

	K12	80.50	68.87	300	Mooring (ADCP)	8/8/03 23:00
	K12	80.50	68.87	300	Rosette/CTD & Doppler	8/9/03 0:00
	K13	80.51	69.00	200	Mooring (SBE37)	8/9/03 3:18
	K13	80.51	69.00	200	CTD & Doppler	8/9/03 3:48
	P04	80.53	69.20	20	Mooring (pressure)+clams	8/9/03 8:18
	P03	80.52	66.67	20	Mooring (pressure)+clams	8/9/03 17:18
	KN	81.03	65.60	300	Mooring (ADCP)	8/10/03 2:50
	P02	81.23	65.95	20	Mooring (pressure)+clams	8/10/03 9:13
	P01	81.20	63.38	20	Mooring (pressure)+clams	8/10/03 17:56
	Waypoint	82.00	61.00	400	Doppler	8/11/03 4:24
Lincoln Sea	section	84.00	60.00	1000	Rosette/CTD & Doppler	8/12/03 4:27
Kennedy Channel	Waypoint	82.00	61.00		Transit	8/13/03 4:29
Smith Sd	Waypoint	78.00	74.00		Transit	8/15/03 2:11
	Waypoint	76.60	71.50		Transit	8/15/03 13:27
Thule	Port call	76.57	68.78		Final transit	8/15/03 17:14

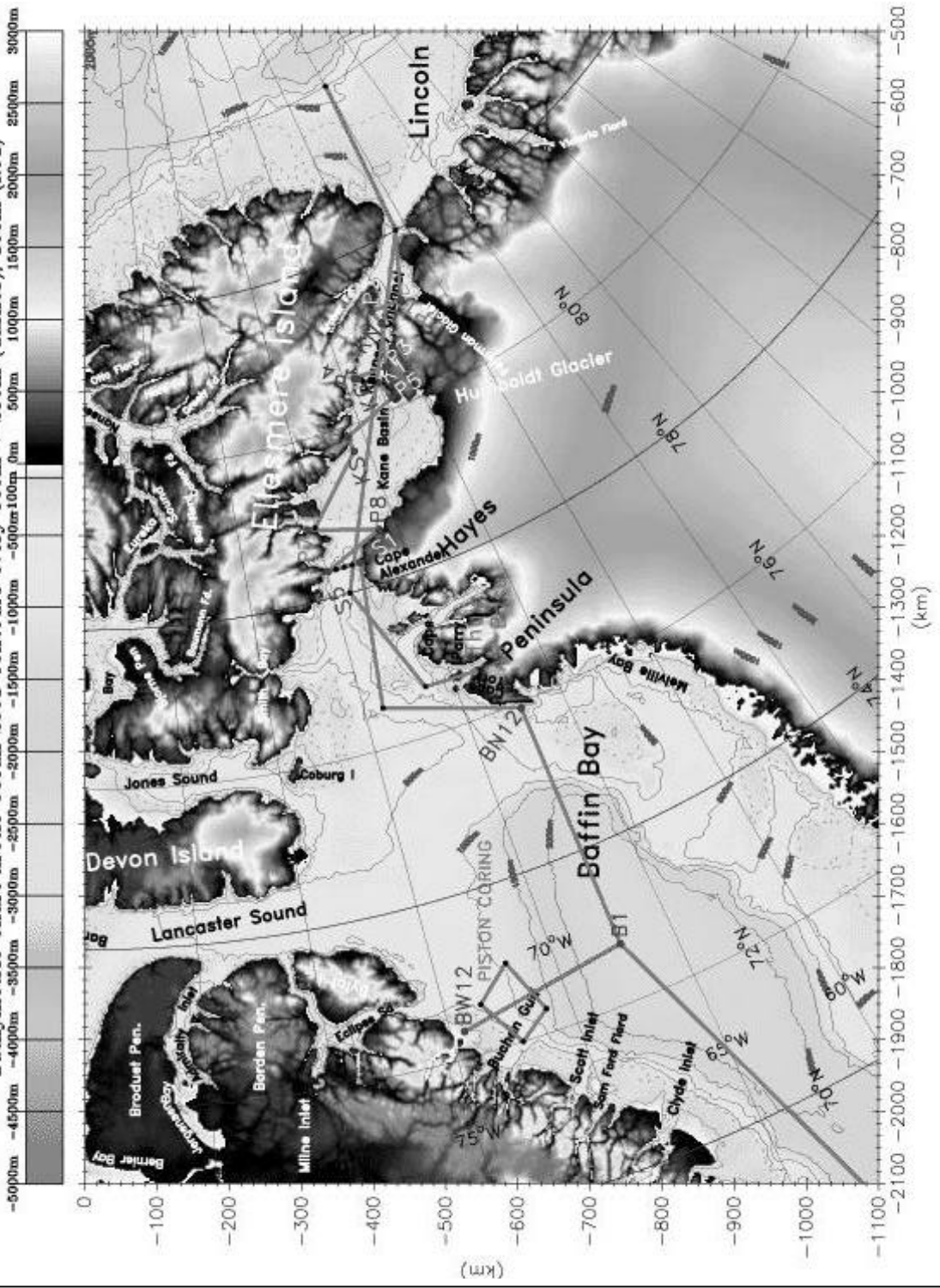
5. GEOGRAPHICAL AREAS

5.1 Indicate geographical areas in which the project is to be conducted (with reference in latitude and longitude): See above

5.2 Attach chart(s) at an appropriate scale showing the geographical areas of the intended work and, as far as practicable, the positions of intended stations, the tracks of survey lines, and the locations of installations and equipment.

Figure Caption: *Map of proposed science cruise track for July-August 2003 USCGC Healy Nares St. Expedition.* The expedition will begin at St. John's, Newfoundland on 21 July and we expect to arrive at B1 on about 24 July. Lines B1-BW12 and B1-BN12 indicate sections consisting of approximately 12 hydrographic stations each in northern Baffin Bay. The red box encloses the region from which we expect to retrieve 4 long piston cores in Canadian waters. From BN12 to S1 is a transit. Stations S1 to S5 are hydrographic stations. Stations P1-P8 are target sites for shallow water (< 20 m) subsurface pressure moorings. These moorings will be put in place with the aid of a small boat and divers and/or helicopter depending upon the ice conditions. We will also attempt to retrieve bi-valves near these sites. The K's indicate the array of instrumentation that is to be deployed on sub-surface moorings in Kennedy Channel. Exact placement will depend upon ice conditions. Time and conditions permitting, we will conduct hydrographic stations along a section in the Lincoln Sea. The plan is to then return directly to Thule arriving 15 August. We anticipate retrieving and redeploying the moorings from the ice via aircraft in early spring 2005 and conducting a final retrieval in early spring 2007. Important note: Ice and weather conditions in this region are difficult and variable. We expect to adjust the order of the proposed 2003 activities north of Baffin Bay as ice and weather permit. We will carry out ice reconnaissance missions by helicopter to assist us in the planning process.

Bathymetric Chart Arctic Ocean 2001 Contours every 500m + 250m (dashes), 100m (Red)



6. DATES

6.1 Expected dates of first entry into and final departure from the research area of the research vessel:

Entry July 21, 2003. Departure August 15, 2003

6.2 Indicate if multiple entry is expected: The cruise track alternates between Canadian and Greenland waters.

7. PORT CALLS

7.1 Dates and names of intended ports of call in Denmark: August 15-19, Thule, Greenland

7.2 Any special logistical requirements at ports of call: No

7.3 Name/Address/Telephone of shipping agent (if available): Not available

8. PARTICIPATION

8.1 Extent to which Denmark will be enabled to participate or to be represented in the research project:

PI is in process of seeking marine mammal or bird observer(s) from Greenland to participate in the cruise and has contacted Knud Falk at the Danish Polar Center for this purpose.

8.2 Proposed dates and ports for embarkation/disembarkation:

Embarkation St. John's, Newfoundland 21Jul03; Majority off science party debarks Thule, Greenland 15Aug03; Remaining science party rides through the Northwest Passage to Barrow AK 29Aug03

9. ACCESS TO DATA, SAMPLES AND RESEARCH RESULTS

9.1 Expected dates of submission to Denmark of preliminary reports which should include the expected dates of submission of the final results:

No more than 30 days from the end date of the cruise

9.2 Proposed means for access by Denmark to data and samples: Data will be placed in public archives in the US and Canada.

9.3 Proposed means to provide Denmark with assessment of data, samples and research results or provide assistance in their assessment or interpretation

Contacts in the science and local communities will be forwarded copies of the cruise report. The report and subsequent data summaries and findings and names and contact information of cognizant personnel will be posted at a project web-site in a timely fashion. All data will be archived in timely fashion in accordance with policy established by the National Science

9.4 Proposed means of making results internationally available:

The archival systems for the data are internationally accessible. The PI's will provide additional assistance upon request..

KELLY KENISON FALKNER

ASSOCIATE PROFESSOR

OREGON STATE UNIVERSITY

College of Oceanic & Atmospheric Sciences

Citizenship: U.S.
Date & Place of Birth: March 1, 1960; Lancaster, NH
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EDUCATION

B.A., Chemistry with, Russian minor, Reed College, 1983
Ph.D., Chemical Oceanography, M.I.T./W.H.O.I. Joint Program in Oceanography, 1989
Languages: French & Russian

ACADEMIC POSITIONS

Postdoctoral Researcher, M.I.T., 1989-1990
NATO Postdoctoral Research Fellow, Groupe de Recherche Géodésie Spatiale, Centre National D'Etudes Spatiales, Toulouse, France, 1990-1992
Assistant Professor, College of Oceanic & Atmospheric Sciences, 1992-1997
Associate Professor, College of Oceanic & Atmospheric Sciences, 1997-present

NON-ACADEMIC POSITIONS, EDITORSHIPS, etc...

Associate Editor, *Geochimica et Cosmochimica Acta*, 2002-

RESEARCH INTERESTS

Application of inorganic elemental and isotopic measurements to aqueous geochemical issues.

This entails sampling and analyses of waters and associated solids of diverse media including snow, ice, rivers, lakes, seas and the ocean and analytical technique development using state-of-the-art laboratory instrumentation, including ICPMS, TIMS & IRMS.

Topics studied include:

Recent history of lead pollution in the northern hemisphere as recorded in Greenland snow
Factors controlling the chemical composition of the large lakes (Baikal, Issyk-Kul)
Large-scale biochemical perturbations in the Black Sea
Measurement and cycling of osmium in the oceans

Current projects include:

Tracing origins and pathways of river waters and other contributions to the upper Arctic Ocean
Characterizing nature and causes of variability in Arctic circulation
Characterizing tributary and main stem river chemistry of the Salmon River, OR as part of a collaborative study of salmon life history as recorded in their otoliths
Deciphering sources of recent pronounced freshwater variability in the Gulf of Alaska

HONORS

National Science Foundation Arctic Service Award, 2000
COAS Student Mentoring Award, 2000
Office of Naval Research Young Investigator Award, 1993
NATO Postdoctoral Fellowship, 1990
Association for Women in Science Predoctoral Award, 1987
National Science Foundation Graduate Research Fellowship, 1984-87
Phi Beta Kappa, 1983

PROFESSIONAL ACTIVITIES**National Committees**

University National Oceanographic Laboratory System Arctic Icebreaker Coordinating Committee member 1996-2002

NSF Office of Polar Programs, Ocean-Atmosphere-Ice Interactions Steering Committee, 1997-2001

NSF Office of Polar Programs, Strategic Plan for Marine Science in the Arctic Committee, 1998-99

Review Panels

NSERC Site Review Panel for acquisition of ICPMS at UVic, Victoria, BC, January 1994

NSF Chemical Oceanography Panel, July 1993, May 1997 & November 1997

NSERC Earth and Environmental Sciences Grant Selection Committee, 1996-1997

Committee of Visitors to evaluate NSF Office of Polar Programs, July, 2000

Professional Organizations

American Geophysical Union

Association for Women in Science

Oceanography Society

Sigma Xi

American Chemical Society

American Society of Limnology & Oceanography

Field Work

Participant in 28 oceanographic, limnologic and riverine sampling expeditions: 1981-2003; Chief Scientist for 7 missions

RECENT PUBLICATIONS

Guay, C. K., G. P. Klinkhammer, K. K. Falkner, R. Benner, P. G. Coble, T. E. Whitley, B. Black, F. J. Bussell and T. A. Wagner (1999) High-resolution measurements of dissolved organic carbon in the Arctic Ocean by in situ fiber-optic spectrometry, *Geophysical Research Letters* 26:8: 1003-1110.

Moore, W. S. and K. Kenison Falkner (1999) Cycling of radium and barium in the Black Sea, *J. Environmental Radioactivity* 43:247-254.

Macdonald, R. W., E. C. Carmack, F. A. McLaughlin, K. Kenison Falkner and J. H. Swift (1999) Connections among ice, runoff and atmospheric forcing in the Beaufort Gyre, *Geophysical Research Letters*, 26:14:2223-2226.

Woodhouse, O. B., G. Ravizza, K. Kenison Falkner, P.J. Statham and B. Peucker-Ehrenbrink (1999) Osmium in seawater: concentration and isotopic composition vertical profiles in the eastern Pacific Ocean, *Earth and Planetary Science Letters*, 173:223-233.

Sherrell, R. M., Boyle E. A., Falkner K. K., and N.R. Harris (2000) Temporal variability of Cd, Pb, and Pb isotope deposition in central Greenland snow. *Geochem. Geophys. Geosyst.*, vol. 1, Paper number 1999GC000003 [13,582 words, 6 figures, 2 tables]. May 30, 2000.

Guay, Christopher K. H., Kelly Kenison Falkner, Robin .D. Muench, Manfred Mensch, Markus Frank, and Reinhold Bayer (2001) Wind-driven transport pathways for Eurasian Arctic river discharge, *Journal of Geophysical Research*, 106:C6:11,469-11,480.

Alleau, Y., D. Colbert, P. Covert, B. Haley, X. Qiu, R. Collier, K. Falkner, B. Hales, L. Gordon and F. Prahl (2001) Th-234 applied to particle removal rates from the surface ocean: a mathematical treatment revisited, *Geophysical Research Letters*, 28:14:2855-2857.

Jones, E. P., J. H. Swift, L. G. Anderson, G. Civitarese, K. K. Falkner, G. Kattner, M. Lipizer, F. McLaughlin and J. Olafsson (2002) Tracing Pacific water in the North Atlantic Ocean, *Journal of Geophysical Research*, in press.

Vollmer, M. K., R. F. Weiss, R. T. Williams, K. K. Falkner, X. Qiu, E. A. Ralph and V. V. Romanovsky (2002) Physical and chemical properties of the waters of saline lakes and their importance for deep-water renewal: Lake Issyk-Kul, *Geochimica Cosmochimica Acta*, 66:24:4235-4246.

Morison, J. H., K. Aagaard, K. K. Falkner, K. Hatakeyama, R. Moritz, J. E. Overland, D. Perovich, K. Shimada, M. Steele, T. Takizawa and R. Woodgate (2002) The North Pole Environmental Observatory, *EOS, Trans. Am. Geophys. Soc.*, 83:33:357-361.