

CURRICULUM VITAE

GENERAL DATA

Name: **Kent A. Fanning**
Employer: University of South Florida (USF)
Department: Marine Science
Initial Date of USF Employment/Rank: 1973/Assistant Professor
Intermediate positions: Assoc. Professor, tenure (1977); Assist. Dept. Chair (1979-1980 & 1994-2000); Associate Dean (2000-2008)
Present Rank: Professor (awarded in 1984)

EDUCATION

<u>Institution</u>	<u>Field of Study</u>	<u>Degree</u>	<u>Date</u>
Colorado School of Mines	Chemistry	B.S.	1964
Harvard University	Biochemistry	none	1963-64
University of Rhode Island	Oceanography	Ph.D.	1973

SUMMARY OF EDUCATIONAL ACTIVITIES

- director or co-director of 12 MS theses and 4 PhD dissertations
- served on at least 20 MS committees and 7 PhD committees
- currently major advisor or co-major advisor to 3 MS and 2 PhD students
- taught or co-taught advanced courses in sediment geochemistry, phytoplankton/nutrient dynamics, marine geochemistry, and oceanographic research techniques
- conceived and initiated expanded teaching of undergraduate course *Introduction to Oceanography* to as many as four USF campuses via Distance Learning.
- 1 to 5 graduate students in Independent Study or Directed Research each semester

HIGHLIGHTS OF OTHER USF-RELATED ACTIVITIES

- initiated and assisted the development of the relationship with St. Petersburg Progress that led to its support for Marine Science Center of Excellence and PhD, acquisition of Coastal Geology Division of the US Geological Survey, new KORC/DEP laboratory/office complex, and many other critical aspects of the progress of the department
- major participant in initiating the USF Marine Science Center of Excellence and PhD, 1975-1980
- proposal and document preparation for USF's effort to attract the USGS Coastal Geology Division
- Chair of Departmental building committee for new Knight Oceanographic Research Center (KRC) building and thus involved in selection of architect and building manager, discussions to get building raised off ground level, budget allocations, laboratory and office design and distribution, building plan approvals, color and fabric schemes, etc.

- twice Assistant Department Chair (1979-80 and 1994-2000) and involved in:
 - initial planning, St. Petersburg Progress Endowed Chair in Marine Science
 - document preparation for salary adjustments, promotion and tenure
 - salary adjustment calculations
 - administrative activities in the department and between the department and the CAS
 - outreach efforts to business and political leaders in support of USF and Marine Science
 - increasing the undergraduate teaching by Marine Science
 - outreach to public schools through newspaper articles and ocean-related student exercises
- Associate Dean of College of Marine Science (2000-2008) and served as supervisor of the majority of the support personnel of the college and thus involved in HR classifications, salary adjustments, hiring, layoffs, etc.; College representative to the building committee for the new Science & Technology building on the USF St. Petersburg campus in which the College has access to approximately half of the laboratories and classrooms; faculty evaluation and salary adjustment processes, negotiations between the College and its partner marine institutions in the region (e.g., FWRI, Mote Marine Laboratory, and USGS); preparation of annual faculty hiring plans; the procedure for the annual evaluation of the College by the Provost's office; data gathering and form preparation for the University SACS accreditation process in 2003-4; and the preparation of many reports, including the Self-Study for the External Review of the College PhD Program in 2003-4.
- Total Research funding: more than \$6.6 million (uncorrected \$) from NSF, ONR, NOAA, NASA, etc.

AREAS OF SPECIALIZATION

Chemical oceanography
 Nutrients in seawater
 Interstitial chemistry of sediments
 Transport processes across the sediment-water interface
 Geochemical processes in river plumes
 Submarine geothermal springs
 Radioisotope geochemistry

PROFESSIONAL OR RELATED ACTIVITIES

Research expeditions since 1972

26 open ocean cruises (each 1-8 weeks long) to the North Atlantic, the Equatorial Pacific, the Southern Ocean, the Barents Sea, the Caribbean, and the Mediterranean aboard the following research vessels: Alaminos, Trident, Gyre, Knorr, Atlantis II, Researcher, Polar Star, Senja and Andenes (Norwegian), Columbus Iselin, Pelican, Nathaniel B. Palmer.

15 local cruises to Eastern Gulf of Mexico aboard R/V Bellows, R/V Suncoaster, R/V F.G. Walton Smith

Invited observer, NSF GEOSECS Summer Institute, August, 1974

Invited observer, Advisory Panel Meeting, Manganese Nodule Project, International Decade of Ocean Explorations, National Science Foundation, July, 1976

Co-chairman, Session C6 on Benthic Processes and the Geochemistry of Interstitial Waters, Joint Oceanographic Assembly, Edinburgh, Scotland, September, 1976

Chairman, Session on Estuarine and Coastal Marine Chemistry, Fall Meeting of the American Geophysical Union, December, 1976

Member, Ad Hoc Committee to Acquire A Center of Excellence and Ph.D. Program, Department of Marine Science, University of South Florida, 1976-1978

Chairman, Session on Marine Chemistry, Annual Meeting of the American Geophysical Union, April, 1978

Invited member, Visiting panel from U.S. to Joint U.S.-New Zealand Workshop on Ocean Exploration, Co-sponsors: National Science Foundation, New Zealand Department of Science and Industrial Resources, and the University of Auckland, 13-17 Nov., 1978

Section Chairman, IDOE Conference on River Interaction with the Ocean (RIO), Philadelphia, PA, June, 1979

Invited participant, GOMEX Conference, National Oceanographic and Atmospheric Administration, October, 1979

Assistant Chairman, Department of Marine Science, University of South Florida, 1979-1980

Member, Environmental Development Commission, City of St. Petersburg, FL, 1982-1989, Vice Chairman (1985-1988), Chairman (1988-1989)

Invited observer, Ocean Sciences Advisory Committee, National Science Foundation, November, 1984 to 1987

Session Chairman on Reactive Variables in the Ocean, Joint Meeting of Amer. Geophys. Union and Amer. Soc. Limnol. and Oceanogr., New Orleans, LA., Jan. 1987

Invited Investigator, Norwegian Research Program for Marine Arctic Ecology (PROMARE), 1986 to 1988

Invited Member, Committee on Seabed Utilization in the Exclusive Economic Zone of the U.S., Marine Board of the National Research Council, 1987-1990

Editor, Journal of Geophysical Research (Oceans), 1992-1999.

Invited Participant, Nitrogen Dynamics in the North Atlantic Basin, Block Island, RI., 8-14 May 1994. (Convenors: R.W. Howarth and J.N. Galloway). Expenses paid by World Meteorol. Org. of U.N. and the Mellon Foundation.

Invited Member, National Science Foundation Review Panel on Western Arctic Shelf-Basin Interactions, Office of Polar Programs, Aug. 8-10, 2001.

Invited Member, External Review Panel, Geochemical and Environmental Research Group (GERG), Texas A & M University, College Station, TX, Feb. 25-27, 2009

PATENT (US)

Method for measuring nitrite and nitrate in aqueous medium (US Patent Number 5,858,792).
 Inventors: Fanning; Kent (St. Petersburg, FL); Masserini, Jr.; Robert (Gulfport, FL)
 Assignee: University of South Florida (Tampa, FL)

Issued: January 12, 1999

HONORS, AWARDS, BIOGRAPHIES

Engineers Day Scholarship, Colorado School of Mines, 1959-63
B.S. Degree with High Honors
National Science Foundation Graduate Fellowship, University of Rhode Island, 1967-70
National Science Foundation Student Observer, Joint Oceanographic Assembly, Tokyo, 1970
Phi Kappa Phi Honorary Society
Award and biography, Outstanding Young Men of America, 1975
American Men and Women of Science
Sigma Xi
Who's Who in the South and Southwest

PROFESSIONAL ORGANIZATIONS

The American Geophysical Union
The Oceanography Society

RESEARCH AND CREATIVE ACTIVITIES

1. Publications

Books

Studies on Dissolved Silica at the Boundaries of the Ocean System. University Microfilms, Ann Arbor, Michigan, 1973.

The Dynamic Environment of the Ocean Floor. 1982. D.C. Heath and Company, Lexington, Massachusetts (edited by K.A. Fanning and F.T. Manheim), 502 p.

Chapters or segments of books

Inorganic aspects of petroleum operations. In: Proceedings of Marine Environmental Implications of Offshore Drilling in the Easter Gulf of Mexico (ed. R.E. Smith), 1974, State University System Institute of Oceanography, 1974 (E.R. Corcoran and K.A. Fanning, pp. 235-252).

Nutrients in Tampa Bay. In: Proceedings of the Bay Area Scientific Information Society (edited by R. Lewis and J.L. Simon), 1985, Bellweather Press., Minneapolis, MS (Fanning, K.A. and L.M. Bell, pp. 109-129).

The use of mixing curves in the study of processes in river plumes. In: *The Review of the Health of the Oceans*, G.E.S.A.M.P., United Nations Educ. Sci. and Cultural Org., Paris, France, 1984 (Fanning, K.A.).

²²⁶Ra and ²²²Rn in Florida's rivers and estuaries. In: *Proceedings of the Florida Natural Radiation and Technologically Enhanced Radiation Symposium* (ed. W. Properzio), Daytona Beach, FL, 1987 (K.A. Fanning, J.A. Breland II, and L. Torres) -- pp. 162-169.

²²⁶Ra and ²²²Rn along Florida's coasts. In: *Proceedings of the Florida Natural Radiation and Technologically Enhanced Radiation Symposium* (ed. W. Properzio), Daytona Beach, FL, 1987 (K.A. Fanning, L. Torres, and J.A. Breland II) -- pp. 203-209.

Some observations of ²²⁶Ra and ²²²Rn in the public drinking water supply of St. Petersburg, Florida during the period 1980-1982. In: *Proceedings of the Florida Natural Radiation and Technologically Enhanced Radiation Symposium* (ed. W. Properzio), Daytona Beach, FL, 1987 (J.A. Breland II and K.A. Fanning) -- pp. 128-139.

Nitrate. In: *Sediment Monitoring at Deep-Ocean Low-Level Radioactive Waste Disposal Sites -- Methods Manual*. Editor: J. Booth. U.S. Env. Prot. Admin., Office of Radiation Programs, Wash., DC., 1988.

Oceanography and Chemical Oceanography Terms. In: **Glossary of Geology**, 4th Edition, Julia Jackson (editor), American Geological Institute, Alexandria, VA, 1997, 769 pp.

Muller-Karger, F.E., R. Varela, R.C. Thunell, M.I. Scranton, G.T. Taylor, Y. Astor, C.R. Benitez-Nelson, L. Lorenzoni, K.A. Fanning, E. Tappa, M.A. Goñi, D. Rueda, and C. Hu. 2010. The Cariaco Basin: CARIACO Oceanographic Time Series. In: *Carbon and Nutrient Fluxes in Continental Margins: A Global Synthesis*, (edit. By K.-K Liu, L. Atkinson, R. Quiñones, L. Talaue-McManus), Springer-Verlag, Berlin, Heidelberg.

Articles

Schink, D.R., K.A. Fanning, & J. Piety. A sea-bottom sampler that collects both water and sediment simultaneously. 1966. *J. Mar. Res.*, **24**, 365-374.

Fanning, K.A. & D.R. Schink. 1969. Interaction of marine sediments with dissolved silica. *Limnol. Oceanogr.*, **14**, 59-69, 1969.

Fanning, K.A. & M.E.Q. Pilson. 1971. Interstitial silica and pH in marine sediments: some effects of sampling procedures. *Science*, **173**, 1228-1231

- Fanning, K.A. & M.E.Q. Pilson. 1972. A model for the anoxic zone of the Cariaco Trench. *Deep-Sea Res.*, **19**, 847-863.
- Fanning, K.A. & M.E.Q. Pilson. 1973. On the spectrophotometric determination of dissolved silica in natural waters. *Anal. Chem.*, **45**, 135-140.
- Fanning, K.A. & M.E.Q. Pilson. 1973. The lack of inorganic removal of dissolved silica during river-ocean mixing. *Geochem. Cosmochim. Acta* **37**, 2405- 2415.
- Fanning, K.A.. 1973. Studying the chemicals trapped between deep-sea mud particles. *Maritimes*, **17**, 14-51 -- non-refereed.
- Fanning, K.A. & M.E.Q. Pilson. 1974. The diffusion of dissolved silica out of deep-sea sediment. *J. Geophys. Res.*, **79**, 1293-1297.
- Schink, D.R., Fanning, K.A., & M.E.Q. Pilson. 1974. Dissolved silica in the upper pore waters of the Atlantic floor. *J. Geophys. Res.*, **79**, 2243-2250.
- Schink, D.R., N.L. Guinasso, & Fanning, K.A.. 1975. Processes affecting the concentration of silica at the sediment-water interface of the Atlantic Ocean. *J. Geophys. Res.*, **80**, 3013, 3131.
- Carder, K.L., Fanning, K.A., P.R. Betzer, & V.I. Maynard. 1977. Dissolved silica and the circulation in the Yucatan Strait and deep eastern Gulf of Mexico. *Deep-Sea Res.*, **24**, 1149-1160, 1977.
- M.L. Bender, Fanning, K.A., P.N. Froelich, G.R. Heath, & V.I. Maynard. 1977. Interstitial nitrate profiles and the oxidation of sedimentary organic matter in the eastern Equatorial Atlantic. *Science*, **198**, 605-609, 1977.
- Fanning, K.A. & V.I. Maynard. 1978. Dissolved boron and nutrients in the mixing plumes of the major tropical rivers. *Netherlands J. of Sea Res.: special volume on investigation of the Congo River plume*, **12(3/4)**, 345-354.
- Fanning, K.A., J.A. Breland, & R.H. Byrne. 1980. *Marine Geothermal Springs Along Florida's West Coast. Coast. Oceanogr. & Climatol. News*, **2**, -- non-refereed.
- Fanning, K.A. & V. Maynard-Hensley. 1980. Oxidative changes to nitrate and boron in marine pore waters. *Nature*, **287**, 38-41.
- Fanning, K.A., R.H. Byrne, J.A. Breland II, P.R. Betzer, W.S. Moore, R.J. Elsinger, & T.E. Pyle. 1981. Geothermal springs of the West Florida continental shelf: evidence for dolomitization and radionuclide enrichment. *Earth & Plant. Sci. Lett.*, **52**, 345-354.

- Fanning, K.A., J.A. Breland & R.H. Byrne. 1982. Radium-226 and radon-222 in coastal waters and rivers of west-central Florida: high concentrations and atmospheric degassing. *Science*, **215**, 667-670.
- Fanning, K.A., K.L. Carder and P.R. Betzer. 1982. Sediment resuspension by coastal waters: a potential mechanism for nutrient re-cycling on the oceans margins. *Deep-Sea Res.*, **29(8A)**, 953-965.
- G.A. Vargo, K.A. Fanning, & L.M. Bell. 1984. Antarctic plankton and the marine geochemistry of radium-226, barium, and germanium. *Antarctic Jour. of the U.S.*, **18**, -- non-refereed.
- G.A. Vargo, K.A. Fanning, C. Heil, & L.M. Bell. 1986. Growth rates and the salinity response of an Antarctic ice microflora community. *Polar Biol.* **5**, 241-247.
- Fanning, K.A., G.A. Vargo, L.M. Bell, & R.W. Young. 1988. Covariation of reactive solutes in the sea. *Marine Chemistry*, **24**, 215-238.
- Fanning, K.A.. 1989. Influence of atmospheric pollution on oceanic nutrient limitation. *Nature*, **339**, 460-463.
- Fanning, K.A. & L.M. Torres. 1991. ²²²Rn and ²²⁶Ra: Indicators of sea-ice effects on air-sea gas exchange. *Polar Res.* **10**, 51-58.
- Fanning, K.A.. 1992. Nutrient provinces in the sea: concentration ratios, reaction rate ratios, and ideal co-variation. *Jour. Geophys. Res.* **97**, 5693-5712.
- Rutherford, E.H., B.J. Bendis, G.A. Vargo, and K.A. Fanning. 1995. Review of historical Tampa Bay water quality data. *Florida Sci.*, **58**, 67-81.
- Squires, A.P., G.A. Vargo, R.H. Weisberg, K.A. Fanning, and B. Galperin. 1995. Review and synthesis of historical Tampa Bay water quality data. *Florida Sci.*, **58**, 228-233.
- Michaels, A.F., D.Olson, J.L.Sarmiento, J.W.Ammerman, K.Fanning, R.Jahnke, A.H.Knap, F.Lipschultz, & J.M.Prospiero.1996. Inputs, Losses and transformations of nitrogen and phosphorus in the pelagic North Atlantic Ocean. *Biogeochemistry* **35**: 181-226.
- Wanninkhof, R., G. Hitchcock, W.J. Wiseman, G. Vargo, P.B. Ortner, W. Asher, D.T. Ho, P. Schlosser, M.L. Dickson, R. Masserini, K. Fanning, and J.-Z. Zhang. 1997. Gas exchange, dispersion, and biological productivity on the west Florida shelf: results from a Lagrangian tracer study. *Geophys. Res. Lett.*, **24**, 1767-1770.

- Walsh, J.J., D.A. Dierterle, F.E. Muller-Karger, R. Bohrer, W. P. Bissett, R. Aparicio, R. J. Varela, H.T. Hochman, C. Schiller, R. Diaz, R. Thunell, G. T. Taylor, M.I. Scranton, K.A. Fanning, and E.T. Peltzer. 1999. Simulation of carbon/nitrogen cycling during spring upwelling in the Cariaco Basin. *Jour. Geophys. Res.*, **104**, 7807-7825.
- Masserini, R.T., Jr. and K.A.Fanning. 2000. A Sensor Package for the Simultaneous Determination of Nanomolar Concentrations of Nitrite, Nitrate, and Ammonia in Seawater by Fluorescence Detection. *Marine Chemistry*, **68**, 323-333.
- Lenes, J.M., B.P. Darrow, C. Cattrall, C. Heil, G.A. Vargo, M. Callahan, R.H. Byrne, J.M. Prospero, D.E. Bates, K.A. Fanning, and J.J. Walsh. 2001. Iron fertilization and the Trichodesmium response on the West Florida shelf. *Limnol. Oceanogr.* **46**, 1261-1277.
- G.A. Vargo, C.A. Heil, D. Spence, M.B. Neely, R. Merkt, K. Lester, R.H. Weisberg, J.J. Walsh, and K. Fanning. 2002. The hydrographic regime, nutrient requirements, and transport of a *Gymnodinium breve* DAVIS red tide on the West Florida shelf. *Proc. 9th Intern. Symp. Harmful Algal Blooms*, Hobart, Tasmania, ed. Hallegraeff, Blackburn, Bolch, & Lewis, pp. 157-60,.
- Darrow B.P., Walsh J.J., Vargo G.A., Masserini R.T., Fanning K.A., and Zhang J.Z. 2003. A simulation study of the growth of benthic microalgae following the decline of a surface phytoplankton bloom. *Contin. Shelf Res.*, **23**, 1265-1283.
- Walsh, J.J., R. Weisberg, D. Dieterle, R. He, B. Darrow, J. Jolliff, K. Lester, G. Vargo, G. Kirkpatrick, K. Fanning, T. Sutton, A. Jochens, D. Biggs, B. Nababan, C. Hu, and F. Muller-Karger. 2003. Phytoplankton response to intrusions of slope water on the West Florida Shelf: models and observations. *Jour. Geophys. Res.*, **108**, 3190, doi: 10.1029/2002JC001406.
- Y.M. Serebrennikova and K.A. Fanning. 2004. Nutrients in the Southern Ocean GLOBEC Region: Variation, Water Circulation and Cycling. *Deep-Sea Res. II*, **51**, 1981-2002.
- Walsh, J.J., J.K. Jolliff, B.P. Darrow, J.M. Lenes, S.P. Milroy, A. Remsen, D.A. Dieterle, K.L. Carder, F.R. Chen, G.A. Vargo, R. H. Weisberg, K.A. Fanning, F.E. Muller-Karger, E. Shinn, K.A. Steidinger, C.A. Heil, C.R. Tomas, J.S. Prospero, T.N. Lee, G.J. Kirkpatrick, T.E. Whitledge, D.A. Stockwell, T.A. Villareal, A.E. Jochens, and P.S. Bontempi. 2006. Red tides in the Gulf of Mexico: where, when, and why? *Journal of Geophysical Research* **111**: C11003, doi:10.1029/2004JC002813
- Scranton, M.I, M. McIntyre, Y. Astor, G.T. Taylor, F. Muller-Karger, K. Fanning. 2006. Temporal Variability in the Nutrient Chemistry of the Cariaco Basin. pp.

139-160, In: Neretin L., Jorgensen B.B. & Murray J. (eds.), Past and Present Water Column Anoxia, NATO Sci Ser., Springer Publ., 541 p.

Serebrennikova, Y., K.A. Fanning, & J.J. Walsh. 2008. Modeling the nitrogen and carbon cycling in Marguerite Bay, Antarctica: annual variations in ammonium and Net Community Production. *Deep-Sea. Res. II*, **55**, 393-411
doi:10.1016/j.dsr2.200700.009

Thunell, R., C. Benitez-Nelson, F. Muller-Karger, L. Lorenzoni, K. Fanning, M. Scranton, R. Varela, and Y. Astor. 2008 Si cycle in the Cariaco Basin, Venezuela: Seasonal variability in silicate availability and the Si:C:N composition of sinking particles, *Global Biogeochem. Cycles*, **22**, GB4001,
doi:10.1029/2007GB003096.

Vargo, G.A., C.A. Heil, K.A. Fanning, L.K. Dixon, M.B. Neely, K. Lester, D. Ault, S. Murasko, J. Havens, J.J. Walsh, and S. Bell. 2008. Nutrient availability in support of *Karenia brevis* blooms on the central West Florida Shelf: What keeps *Karenia* blooming? *Contin. Shelf. Res.*, **28**, 73-98.

Muller-Karger, F., K. Fanning, A. Hine, W. Hogarth, and J. Dixon. 2010. The College of Marine Science at the University of South Florida. *Gulf of Mexico Science*, **28**, 164-172

Podlaska A., S.G. Wakeham, K.A. Fanning, and G.T. Taylor. 2012. Microbial community structure and chemoautotrophic activity in the oxygen minimum zone of the eastern tropical North Pacific. *Deep-Sea Research Part I*. **66**, 77-89,
doi:[10.1016/j.dsr.2012.04.002](https://doi.org/10.1016/j.dsr.2012.04.002)

Taylor G.T., F. Muller-Karger, R.C. Thunell, M.I. Scranton, Y. Astor, R. Varela, L. Troccoli-Ghinaglia, L. Lorenzoni, K.A. Fanning, S. Hameed, O. Doherty. 2012. Ecosystem response to global climate change in the southern Caribbean Sea. *Proc. Nat'l. Acad. Sci. (USA)* doi:10.1073/pnas.1207514109.

Technical Reports

The chemical, physical, and biological processes influencing particle-sea interactions in the Caribbean Sea and Gulf of Mexico, Office of Naval Research, 1977, 54 pages (co-authors P.R. Betzer and K.L. Carder).

Environmental studies of hydrothermal discharges on the west Florida continental shelf, Department of Energy, 1977, 22 pages (co-authors, R.H. Byrne and P.R. Betzer).

The chemical, physical, and biological processes influencing particle-sea interactions in the Caribbean Sea and Gulf of Mexico, Office of Naval Research, 1978, 83 pages (co-authors, P.R. Betzer and K.L. Carder).

The properties and impact of submarine geothermal springs on the west Florida continental shelf, Department of Energy, 1978, 35 pages (co-authors, R.H. Byrne and P.R. Betzer).

The chemical, physical, and biological processes influencing particle-sea interactions in the Caribbean Sea and Gulf of Mexico, Office of Naval Research, 1979, 61 pages (co-authors, P.R. Betzer and K.L. Carder).

Environmental Management and Public Concern, Final Report to Gulf of Mexico Planning Workshop (GOMEX) (ed. D. Atwood), N.O.A.A., 1980, 39 pages.

The west Florida continental shelf: a study of geothermal flows and other processes affecting radionuclides and trace metals, Department of Energy, 1980, 28 pages (co-authors, R.H. Byrne and P.R. Betzer).

Dissolved Salts. In: River Interactions with the Ocean. Report of River plumes, IDOE Workshop (ed. R.J. Gibbs), pp. 19-34, 1980.

Chemical Measurements. In: Physical, Chemical and Biological Measurements off Puerto Rico, 1981, U.S. Department of Energy, DOE/NBM-1043 (vols. 1 and 2), Lawrence Berkeley Laboratories, Berkeley, California.

Chemical parameters. 1992. Section 3.2 in: Review and synthesis of historical Tampa Bay water quality data -- Final report, Tampa Bay National Estuary Program Technical Rep #7-92, King Engineering, Inc., Tampa, FL.

The role of urea in the dynamics of phytoplankton in Tampa Bay, Final Report, Surface Water Improvement and Management Program. Southwest Florida Water Management District, 1993.

GERG External Review Committee Report, authors: Kent Fanning, Fredrick Prahl, & Robert Weller, March 31, 2009

Book Reviews

The Nature of Seawater, Report of the Dahlem Workshop on the Nature of Seawater, Berlin, March 10-15, 1975 (edited by E.D. Golfberg), 719 pages, *Limnol. Oceanogr.*, **22**, 972, 1977.

The Fate of Fossil Fuel CO₂ in the Oceans, Marine Science Series, Volume 6, Plenum Press, New York, 1977 (edited by N.R. Andersen and A. Malahoff), 749 pages, *Bull. Amer. Meteor. Soc.*, **61**, 30-32, 1980.

Feature Newspaper Articles on Science

"Florida's Rise", Discovery Section, ST. PETERSBURG TIMES, May 18, 1993 (the historical role of Florida's limestone in controlling carbon dioxide and global warming).

"Solar Powered", Discovery Section, ST. PETERSBURG TIMES, March 1, 1994 (sunlight, ocean color, and the marine food web)*.

"Inside Real Florida", Discovery Section, ST. PETERSBURG TIMES, March 8, 1994 (the balance of seawater and freshwater flows in the limestone beneath Florida)*.

"The Living Ocean", Discovery Section, ST. PETERSBURG TIMES, March 7, 1995. (The Florida Aquarium and what its purification systems reveal about the cycling of nutrients in the sea)*

"Under the Bridge", Discovery Section, ST. PETERSBURG TIMES, March 14, 1995 (The Florida Aquarium and the features and influences on sea life attached to horizontal and vertical surfaces in the ocean)*

**sent to Florida public schools in Pinellas and Hillsborough counties along with collections of student exercises on the oceans*

2. Grants and Contracts

National Science Foundation, #GA41200. Dissolved silica in the deep eastern Caribbean Sea, January 1, 1974 - December 31, 1975. \$45,900.

Bureau of Land Management. Dissolved micronutrients from the MAFLA lease area, Contract MAFLA 08559 CT4-11, May 1, 1974 - December 31, 1974. (Component of the SUSIO Consortium). \$5,870.

National Science Foundation, supplement to #GA-41200. Benthic processes affecting dissolved silica and phosphate in semi-enclosed marine basins, April 1, 1975 - December 31, 1975. \$8,700.

National Science Foundation, #OCE 74-01480-A02. Benthic diffusion and marine nutrients, January 1, 1975 - December 31, 1976. \$38,505.

National Science Foundation, DES and IDO #OCE 76-10515. Conference on benthic processes and the geochemistry of interstitial waters of marine sediments, January 1, 1976 - July 1, 1977. \$38,000. (with Frank T. Manheim and William W. Hay).

Texas A&M University. Analytical services on R/V GYRE cruise 76-G-4, January 1, 1976 - (indefinite). \$2,400.

Florida Power Corporation. Evaluation of Anclote Estuary Water Quality Data from 1971 to 1975, February, 1976 - June, 1976. \$3,759.

City of Tampa, Florida. Laboratory analyses of nutrients in connection with primary productivity experiments in Hillsborough Bay, Florida, January, 1976 - (indefinite). \$16,230.

United States Department of the Interior. Bibliographic studies on marine mineral resources, August 1, 1976 - July 31, 1977. \$4,739.

National Science Foundation. #OCE-7682416. The rates of interstitial reactions in upper marine sediment: silica and related variables, January 1, 1977 - December 31, 1978. \$101,124.

Office of Naval Research, #N00014-75-CO39. The chemical, physical, and biological processes influencing particle-sea interactions in the Caribbean Sea and Gulf of Mexico, April 1977 - January 1978. \$120,000 (with P.R. Betzer and K.L. Carder).

United States Department of Energy, #EE-77-S-05-54B6. Physical and chemical properties of a geothermal submarine spring, July 1977 - June 1979. \$104,000 (with T.E. Pyle and P.R. Betzer).

Office of Naval Research, #N00014-75-C-539. The chemical, physical, and biological processes influencing particle-sea interactions in the Caribbean Sea and Gulf of Mexico, February 1978 - January 1980. \$249,000 (with P.R. Betzer and K.L. Carder).

United States Department of Energy, #79EV05486.000. The properties and impact of submarine geothermal springs on the west Florida shelf, October 1979 - September 1980. \$54,000 (with R.H. Byrne and P.R. Betzer).

United States Department of Energy, #79EV05486.000. Processes affecting radionuclides and trace metals on the west Florida continental shelf, October 1980 - March 31, 1982. \$30,000 (with R.H. Byrne and P.R. Betzer).

United States Bureau of Land Management. Nutrient analyses on the west Florida shelf. Subcontract through Continental Shelf Associates, September 1980 - August 1981. \$8,400.

City of Tampa, Florida. Nutrient Analyses of Hillsborough Bay, Florida, September 1, 1980 - December 1, 1980. \$13,650.

United States Department of Energy, Office of Thermal Energy Conversion.
Chemical studies of the OTEC site off southeastern Puerto Rico, September 1,
1980 - December 31, 1981. \$21,946.

USF Faculty Research & Creative Scholarship Award. A method for re-evaluation of
the Redfield Ratios for Nutrients and Carbon Dioxide in the Deep Sea, April 22,
1982 to September 21, 1983. \$3,400.

City of Tampa. Nutrient Storage & Release in Hillsborough Bay Sediments, January
1, 1983 - December 31, 1983. \$12,466.

National Science Foundation, DPP-8214213. Antarctic plankton and the marine
geochemistry of radium, germanium, and barium. (with G.A. Vargo) September
1, 1982 - May 30, 1986. \$150,412.

National Science Foundation, Travel grant to attend IUGG in Hamburg, Germany,
August 1983. \$1,500.

City of Tampa. Nutrient Storage and Release in Hillsborough Bay Sediments. Up to
\$12,466 (on a per sample basis). January 31, 1983 - (indefinite).

National Science Foundation - International Programs. Food web studies in the
Barents Sea (Cooperative grant run through Scripps Institute, O. Holm-Hansen,
coordinator) April 1, 1985 - June 30, 1986. \$4,500.

University of South Florida - Faculty Research and Creative Scholarship Award,
April 1, 1985 - June 1, 1986. \$3,200. Turbulence ^{222}Rn , ^{226}Ra , and
photoadaptation in Arctic phytoplankton.

University of South Florida - Faculty Research and Creative Scholarship Award,
April 1, 1980 - March 31, 1989. \$5,000. Radon and radium under sea ice -- a
study of mixing in a Polar ocean.

American Scandinavian Foundation. The use of radon-222 and radium-226 in the
Barents Sea as tracers of seawater circulation and its effects on phytoplankton.
\$2,000. Spring/Fall, 1988.

Florida Surface Water Improvement and Management Program (SWIM), Southwest
Florida Water Management District. The role of urea in nitrogen dynamics of
phytoplankton in Tampa Bay. \$16,320. June, 1989 - May, 1990.

National Science Foundation. Dynamics of Ventilation of the Central Caribbean
Deep Basin (OCE-9013392), 3/1/90 - 9/30/93. Co-P.I.'s C. Rooth and W. Johns
of RSMAS at Univ. of Miami. Total Funding to me: \$192,000 (NSF) + \$2989
(USF) = \$194,899 or \$55,685 per year. Overall funding: \$1,300,000.

National Science Foundation, Travel Award to attend PRO MARE conference in Trondheim, Norway, 12-16 May 1990, five Co-P.I.'s, my portion: \$1125, awarded through Scripps Institution of Oceanography.

National Science Foundation. OCE9207157, Nutrient analyses on WOCE Pacific Line P-13, 06/15/92 - 05/31/93, \$28,000.

Florida Department of Natural Resources, Water column analyses research, contract C7100, 05/02/92 - 05/01/93, \$16,500.

Florida Department of Natural Resources, Nutrient and salinity analyses on waters from the West Florida Shelf, contract C8122, 07/01/93 - 12/31/93, \$8,250.

National Science Foundation. Nutrient/oxygen analyses in the Arabian Sea, subcontract from JGOFS Arabian Sea Process Study Logistics grant through Old Dominion Univ., 05/94 - 03/97, \$49,934.

National Oceanic & Atmospheric Administration, Design of modules for measuring nitrate and ammonia on a towed instrument array (co-PI's: R. Gilbert, USF College of Engineering, and S. Hendrix, Univ. of Tampa, Chemistry Dept.), NA360A0292 (part of USF Institute for Marine Engineering), 08/01/93 - 07/31/94, \$47,683.

National Aeronautics & Space Administration, Biological changes following reconnections of BMCD/USFWS impoundments on the Kennedy Space Center, NAG10-0130, 12/02/93 - 12/01/96, \$67,500.

Office of Naval Research, Sensors for nitrate and ammonia in seawater, (co-PI's: R. Gilbert, USF College of Engineering, and S. Hendrix, Univ. Tampa, Chemistry Dept.) sub-contract from N00014-94-1-0871, Support of the Research Activities of a Marine Engineering Institute at the University of South Florida, 06/01/94 - 05/31/95, \$43,200.

Office of Naval Research, High-sensitivity nutrient sensors in seawater, (co-PI's: R. Gilbert, USF College of Engineering, and S. Hendrix, Univ. Tampa, Chemistry Dept.), sub-contract from N00014-94-1-0963, Development of Sensing Systems and Unmanned Underwater Vehicles for Land Margin-Continental Shelf Oceanographic and Environmental Measurements, 08/01/94 - 07/31/95, \$165,585.

Office of Naval Research, Development of a Remote Sensing Capability for Nitrogen-Bearing Nutrients on an unmanned underwater vehicle in the coastal ocean, (co-PI's: R. Gilbert, USF College of Engineering, and S. Hendrix, Univ. Tampa, Chemistry Dept.), Contract # N00014-96-1-5024, 1/1/96 - 12/31/97, \$556,582.

Office of Naval Research, An AUV-based Investigation of the Role of Nutrient Variability in the Predictive Modeling of Physical Processes in the Littoral Ocean, (co-PI's: J. Walsh, USF Marine Science, and R. Gilbert, USG College of Engineering), Contract # N00014-96-1-5024, 10/1/97 - 12/31/98, \$468,849

Office of Naval Research, An AUV-based Investigation of the Role of Nutrient Variability in the Predictive Modeling of Physical Processes in the Littoral Ocean, (co-PI: J. Walsh, USF Marine Science) Contract # N00014-96-1-5024, 8/1/98 - 12/31/99, \$399,087

National Science Foundation. Nutrient/oxygen/hydrographic analyses in the Southern Ocean, subcontract from JGOFS Southern Ocean Process Study Logistics grant through Univ. of Tenn., 9/1/96-12/31/98, \$82,918.

Ocean Farming, Inc. Phase I Experiments: solubility and chemical reactions of Iron Ke-Min and use by phytoplankton, (co-PI's: G. Vargo and R. Byrne), 9/1/96-indefinite, \$25,000

Office of Naval Research, An AUV-Based Investigation of the Role of nutrient Variability in the Predictive Modeling of Physical Processes in the Littoral Ocean, (co-PI: J. Walsh, USF Marine Science), Contract #N00014-96-1-5024, 12/21/99 to 12/31/00, \$321,739.

National Science Foundation (Office of Polar Programs), WinDSSock: WINter Distribution and Success of Southern Ocean Krill (GLOBEC), (Co-PI's, Eileen Hoffmann and many others), Award # 99-10100, PI's: J.Torres & K. Fanning, \$641,350, Fanning Portion: \$139,906, 9/15/00-2/29/04.

Office of Naval Research, An AUV-Based Investigation of the Role of Nutrient Variability in the Predictive Modeling of Physical Processes in the Littoral Ocean, (co-PI: J. Walsh, USF Marine Science) Second-year Renewal to Contract #N00014-96-1-5024, 12/1/00 to 12/30/01, \$350,041

Office of Naval Research, An AUV-Based Investigation of the Role of Nutrient Variability in the Productive Modeling of Physical Processes in the Littoral Oceans, (Co-PIs: J. Walsh & R. Masserini, College of Marine Science, USF), Contract # N00014-02-1-0240, 1/01/2001 to 4/30/2007, \$1,354,247 (KAF portion: \$1,087,724).

Army Corps of Engineers (pass-through from the Florida Fish & Wildlife Conservation Commission). Data set discovery and discrete analyses and nutrient monitoring of the Caloosahatchee/Charlotte Harbor region, 5/1/05 – 9/30/05, \$52,710.

Office of Naval Research, An AUV-Based Investigation of the Role of Nutrient Variability in the Productive Modeling of Physical Processes in the Littoral

Oceans, (Co-PI: R. Masserini, College of Marine Science, USF), Contract # N00014-07-1-0800, 5/01/2007 to 4/30/2011, \$724,636.

National Science Foundation, Collaborative Research: The Cariaco Basin Oceanographic Time Series Program, Award #0326268 (Co-PI: F. Muller-Karger, R. Weisberg), Oct. 1, 2003- Sept. 30, 2010, \$2,695,079 (KAF portion: \$262,537).

National Science Foundation, Collaborative research: The Cariaco Basin Oceanographic Time Series Program, Award #0963028 (Co-PI: F. Muller-Karger et al.), Nov., 2009- Oct., 2013, \$1,214,290 (KAF portion: \$148,479 = \$37,120/yr, USF account #2500137301)

National Science Foundation, STREAMS-Supporting Talented and Remarkable Environmental And Marine Science students, Award #0728588 (Co-PI's: K. Carvalho-Knighton, A.J. Pyrtle, Henry Alegria), Jan. 1, 2008 – July 31, 2012, \$541,796.

US Geological Survey, Nutrient Analyses for Seawater, USF Acct. 2500135300, 06/09/09 – 09/30/10, \$2,940.

Florida Fish & Wildlife Conserv. Comm. (FWC), Nutrient Analyses from FWRI Ecohab, USF Acct 2500138100, 08/14/10 – 06/30/10, \$8,970

Florida Fish & Wildlife Conserv. Comm., Nutrient Analyses from FWRI Ecohab, USF Acct 2500138100, 09/13/09 – 06/15/11, \$12,000

California State Univ., Seawater nutrient analysis for macroalgal culture medium for Moss Landing Marine Labs, NSF Grant (Mar. 2009-Mar. 2010), USF Acct. 2500138200, 8/18/09 – 8/31/10, \$794

US Geological Survey, Nutrient Analyses for Seawater, USF Acct. 2500151200, 07/16/12 – 07/15/13, \$3,738 (= \$3,738/yr).

3. Abstracts, Oral, and Poster Presentations (since 1980)

Breland, J.A., II, K.A. Fanning, R.H. Byrne, & P.R. Betzer. Hydrothermal processes on the West Florida Shelf. *EOS (abstracts of Fall Meeting, Amer. Geophys. Union)*, **61(46)**, 1980, p. 1003.

Fanning, K.A., K.L. Carder & P.R. Betzer. Turbulent resuspension of sediment on continental margins: a potential mechanism for fertilizing coastal waters. *EOS (abstracts of Fall Meeting, Amer. Geophys. Union)*, **61(46)**, 1980, p. 1000.

Fanning, K.A. Radium-226 and Radon-222 on the West Florida Continental Shelf including Tampa Bay. Lecture to Department of Geology and Geophysics, Yale University, July, 1981.

Breland, J.A., II & K.A. Fanning. ^{226}Ra and ^{222}Rn in rivers and estuaries of western Florida. *EOS (abstracts of joint AGU-ASLO meeting, San Antonio, Texas)*, **63**, 1982, p. 56.

Fanning, K.A. Radon distribution on the northeastern shelf of the Gulf of Mexico: possible anthropogenic input. *EOS (abstracts of joint AGU-ASLO meeting, San Antonio, Texas)*, **63**, 1982, p. 77.

Fanning, K.A. Radiocarbon in North Atlantic Pore Waters: implications for carbonate return to the ocean. XVIII General Assembly, Int. Un. Geod. Geophys., I.A.P.S.O. Symp., Hamburg, Germany, August, 1983. Abstract PS-1, 16.

Vargo, G.A., C. Heil, L. Bell, K.A. Fanning, & C. Hewes. Growth rates of Antarctic ice microflora. AGU/ASLO Ocean Sciences Meeting, January, 1984, New Orleans, LA.

Fanning, K.A., G.A. Vargo, L.M. Bell, and P.N. Froelich. Geochemical cycles and element. Si ratios in Antarctic diatoms. Southern Oceans Meeting, AGU/ASLO, December, 1984, San Francisco, CA. *EOS*, **65**, 915.

Fanning, K.A. Co-variation of reactive variables in the sea. *EOS (abstracts of Fall Meeting, Amer. Geophys. Union)*, **67(44)**, 1008, 1986.

Fanning, K.A. Invited Lecture Nitrate-to-phosphate ratios in the ocean. Graduate School of Oceanography, University of Rhode Island, April, 1987.

Fanning, K.A. Invited Lecture: Radon-222 and radium-226 in high latitude oceans. NSF Conference on Radium and Radon Analyses, Princeton University, May, 1987.

Fanning, K.A. Anomalous $\text{NO}_3:\text{PO}_4$ ratios in the West Central North Atlantic Ocean. *EOS (Abstracts of the 1988 Ocean Sciences Joint Meeting of Amer. Geophys. Union and Amer. Soc. Limnol. and Oceanog.)*, 1754, 1987.

Fanning, K.A. Ideal Nutrient Covariation and Nitrate:Phosphate ratios in the Ocean, presented to Gulf Coast Geochemical Conference, Univ. of S. Miss., Spring, 1988.

- Vesley, E. & K.A. Fanning. 1993. Silica in the deep Caribbean Sea: distributions during three decades. The Oceanography Society, 3rd Annual Meeting (abstract), p. 208.
- Penta, H.L. & K.A. Fanning. 1995. Chemodenitrification in the presence of the oxyhydroxide lipidocrocite in seawater. *First SEPM Congress on Sedimentary Geology, August 13-16, 1995*, **1**, 99-100.
- Rutherford, E.H. & K.A. Fanning. 1996. High N:P ratios in the N.W. Pacific: natural or anthropogenic causes. EOS Transactions (Ocean Sciences Mtg., AGU/ASLO), **76**, p. OS148
- Betzer, P.R., S.E. Dunn, S.M. Smith, R.H. Byrne, K.L. Carder, P.G. Coble, D.K. Costello, K.A. Fanning, T.H. Hopkins. 1996. Sediment-water interactions on continental shelves. EOS Transactions (Ocean Sciences Mtg., AGU/ASLO), **76**, p. OS142
- Rutherford, E.H. & K.A. Fanning. 1996. (NO₃ + NO₂):PO₄ ratios (N:P) in the Arabian Sea. EOS Transactions (Fall AGU meeting), **77**, abstract OS12A-13.
- Serebrennikova, Y.M. & K.A. Fanning. 2002. Study on Ammonia in the Antarctic Ocean. OS41C-28, Amer. Geophys. Union Meeting, February 2002, Hawaii.
- Masserini, R.T., Fanning, K.A., Wanninkhof, R. 2004. Diurnal Cycling of Ammonium and Chlorophyll Within a Bolus of Seawater Labeled With the Deliberate Tracer Sulfur Hexafluoride. *Eos Trans. AGU*, **84**(52), Ocean Sci. Meet. Suppl., Abstract OS32H-07.
- Scranton, M., Fanning, K., Percy, D., Bohrer, R., and Astor, Y. (2006) Long Term Trends in the Cariaco Basin, *Eos Trans. AGU*, **87**(36), Ocean Sci. Meet. Suppl., Abstract OS25G-14
- Serebrennikova, Y and Fanning, K.A. (2006), Nitrogen and Carbon Cycling in Marguerite Bay, Antarctica: a one-dimensional model, *Eos Trans. AGU*, **87**(36), Ocean Sci. Meet. Suppl., Abstract OS36B-24
- Masserini, RT, Fanning, KA, High Resolution Instrumentation for Monitoring Episodic Nutrient Events, 2008 Ocean Sciences Meeting, Session 108, Orlando, FL, March 2-7, 2008
- Thunell, R C, Benitez-Nelson, C., Muller-Karger, F, Lorenzoni, L, Fanning, K, Scranton, M, Varela, R, Astor, Y, Silicon Cycling In The Cariaco Basin, Venezuela: Seasonal Variability In Silicate Availability And The Si:C:N Composition Of Sinking Particles, 2008 Ocean Sciences Meeting, Session 197, Orlando, FL, March 2-7, 2008
- Muller-Karger, FE, Varela, R, Thunell, R, Astor, Y, Scranton, M, Taylor, G,

- Lorenzoni, L, Weisberg, R, Fanning, K, The Cariaco Ocean Time Series Program, 2008 Ocean Sciences Meeting, Session 158, Orlando, FL, March 2-7, 2008
- Li, XN, Flagg, C, Wang, DP, Weisberg, R, Taylor, G. T, Astor, Y, Fanning, K, Scranton, MI, Temporal Variability Of Oxidant And Reductant Supply To The Redox Interface In The Cariaco Basin And Controls On Chemoautotrophy, 2008 Ocean Sciences Meeting, Session 064, Orlando, FL, March 2-7, 2008
- Scranton MI, Li XN, Lopez-Gasca M, Podlaska A, Astor Y, Fanning K, Lorenzoni L, Taylor GT, (2008), Injection of oxygenated water to 300 m in the Cariaco Basin, *EOS Trans. AGU*, 89(53), Fall Meet. Suppl, Abstract PP31C-1502
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- Podlaska, A, S Wakeham, K Fanning, GT Taylor (2010), Microbial Community Structure And Chemoautotrophic Activity In The Oxygen Minimum Of The Eastern Tropical North Pacific, *EOS Trans. AGU*, 91(26), Ocean Sci. Meet. Suppl., Abstract BO23C-02
- Taylor, G T, M. Lopez-Gasca, A. Podlaska, X. Li, L. Lorenzoni, D. Rueda, F. E. Muller-Karger, R Thunell, K. Fanning, R. Varela, Y. Astor, M. I. Scranton (2010), Temporal Variations in the Biogeochemistry of the Permanently Anoxic Cariaco Basin, *EOS Trans AGU*, 91(26) Ocean Sci Meet. Suppl., Abstract BO21B-04
- Muller-Karger, F. E.; Varela, R.; Thunell, R.; Astor, Y.; Scranton, M.; Taylor, G.; Lorenzoni, L.; Rueda, D.; Montes, E.; Fanning, K. The Cariaco Ocean Time-Series Program (Abstract ID: 7833). Amer. Soc. Limnol. Oceanogr. (ASLO) Aquatic Sciences Mtg., San Juan, PR, 13-18 Febr., 2011
- Mayo, M.; Smoak, J. M.; Smith, C. G.; Fanning, K. A.; Determination Of The Uranium Budget In The Shark River Estuary System, Everglades National Park (Abstract ID: 8036). Amer. Soc. Limnol. Oceanogr. (ASLO) Aquatic Sciences Mtg., San Juan, PR, 13-18 Febr., 2011
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Temporal Variations In The Cariaco Basin's Microbial Populations (Abstract ID: 8573) Amer. Soc. Limnol. Oceanogr. (ASLO) Aquatic Sciences Mtg., San Juan, PR, 13-18 Febr., 2011

Potter, M. F.; Fanning, K. A.; Ammonium-Silica Relationships In Anoxic Waters (Abstract ID: 8781) Amer. Soc. Limnol. Oceanogr. (ASLO) Aquatic Sciences Mtg., San Juan, PR, 13-18 Febr., 2011

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