

## *CURRICULUM VITA James K.B. Bishop*

### **EDUCATION**

B.Sc.(Hon.): Physical and inorganic chemistry: University of British Columbia, Canada, May 1971  
Sc.D: Massachusetts Institute of Technology- Woods Hole Oceanographic Institution Joint Program in Oceanography, June 1977. "The chemistry and vertical flux of oceanic particulate matter."

### **EMPLOYMENT**

Post Doctoral Fellow	1977-1978	Lamont-Doherty Earth Obs. Columbia University
Assoc. Research Sci.	1978-1989	Lamont-Doherty Earth Obs. Columbia University
Senior Staff Assoc.	1989-1992	Lamont-Doherty Earth Obs. Columbia University
Research Scientist	1992-1993	Lamont-Doherty Earth Obs. Columbia University
Adjunct Sr. Research Sci.	1993-1997	Lamont-Doherty Earth Obs. Columbia University
Physical Scientist	1993-1997	NASA Goddard Institute for Space Studies, Goddard Space Flight Centre (GS-15)
Professor	1993-1998	School of Earth and Ocean Sciences, University of Victoria, British Columbia, Canada
Adjunct Sr. Research Sci.	1997-2003	Dept. of Applied Physics. Columbia University
Adjunct Professor	1998-2002	School of Earth and Ocean Sciences, University of Victoria, British Columbia, Canada
Geological Staff Scientist	1998-	EO Lawrence Berkeley National Laboratory
Adjunct Professor	1998-	Department of Earth Science, UC Berkeley

### **RESEARCH INTERESTS**

Ocean Carbon Dynamics; Physical, biological, and chemical controls on the cycles of inorganic and organic chemical species in the ocean. Satellite and in-situ remote sensing.

### **TEAM MEMBER**

EOS-Interdisciplinary investigation: "Interannual variability of the carbon, energy and water cycles", J. Hansen, PI. 1993-2000.

SeaWiFS Science Team: "SeaWiFS: Production and analysis of Global Short Wave and Photosynthetically Active Surface Irradiance Fields using International Satellite Cloud Climatology Project (ISCCP) Data" 1988-2003.

### **OTHER CONTRIBUTIONS:**

Carbon Cycle Science Ocean Implementation Group (US Carbon Cycle Science Program). 2002-2004  
Co-Director, DOE Center for Research on Ocean Carbon Sequestration. Co Proposed/chaired AGU sessions on the science of Ocean Carbon Sequestration. 1999-2002

Dec 2001: Proposed and Co-Chaired. AGU special session: "Pushing the Envelope, A tribute to the career and accomplishments of John M. Edmond".

Member: WCRP, Baseline Surface Radiation Budget Network - Science Panel. 1996-2000

Member: US-Joint Global Ocean Flux Study (JGOFS) Time Series oversight committee. 1992-2000

Member: Canadian-JGOFS Science Steering Committee. 1996-1999.

Director: University of Victoria Regional Inductively Coupled Plasma Mass Spectrometer facility 1993-1998.

Reviewer: Nature, Science, Deep-Sea Research, Marine Chemistry, Journal of Marine Research, Limnology and Oceanography, Global Biogeochemical Cycles, Geochimica et Cosmochimica Acta.

Panel member NSF (OCE), NOAA, NOPP

Co-Developer: (with Prof. Glenn Flierl, MIT; Dr. David Glover, WHOI) of the net-work distributed object-oriented data system for JGOFS. The system provides access to distributed physical, geochemical, and biological data bases. Access via Mosaic and Netscape: <http://www1.whoiedu/jgofs.html>

### **PROFESSIONAL AFFILIATIONS**

American Geophysical Union.

**FIELD EXPERIENCE**

**Bishop: 30 Research Expeditions - 79 weeks at sea; & Bishop Group: 5 Expeditions: 19 weeks at sea**

Apr. 1972 W. Metcalf, R/V Knorr, Puerto Rico, 2 weeks.  
Jun. 1972 A.P. Lisitzin, R/V Dmitri Mendeleev, Los Angeles-Callao, 5 weeks.  
Oct. 1973 G. Thompson, R/V Atlantis II, Barbados-San Juan, 4 weeks.  
Dec. 1973 C. Summerhayes, R/V Chain, Dakar-Capetown, 4 weeks.  
Oct. 1974 P. Wiebe, R/V Atlantis II, Bermuda-Woods Hole. 11 days.  
Jun. 1976 J. Corliss, R/V Melville, Balboa-Balboa, 4 weeks.  
Feb. 1978 S. Honjo, R/V Atlantis II, San Juan-WHOI, 3 weeks.  
Jul. 1979 D.W. Spencer, R/V Knorr, Balboa-Balboa, 3 weeks.  
Nov. 1979 S. Honjo, R/V Gilliss, Balboa-Balboa, 2 weeks.  
Sep. 1981 P. Wiebe, Atlantis II-110, Warm Core Gulf Stream Rings. 3 weeks.  
Apr. 1982 P. Wiebe, Oceanus 118, Warm Core Rings. 2.5 weeks  
Jun. 1982 P. Wiebe, Oceanus 121, Warm Core Rings, 2.5 weeks.  
Aug. 1982 P. Wiebe, Oceanus 125, Warm Core Rings, 2.5 weeks.  
Sep. 1982 P. Wiebe, Knorr, Warm Core Rings, 3.5 weeks.  
May. 1990 H. Etcheber, Le Suroit, ECOFER-2, 2 weeks  
Nov. 1991 **Chief Scientist**, Oceanus 246, MULVFS - 5 days.  
Jan. 1992 J. Murray, JGOFS eqpac, MULVFS, 7 weeks  
Aug. 1992 R. Barber, JGOFS eqpac, MULVFS, 7 weeks  
May 1993 **Chief Scientist**, R/V Iselin 9303, MULVFS, - 8 days  
Feb 1996 F. Whitney, R/V Tully 9601, MULVFS 21 days  
May 1996 P. Boyd, R/V Tully 9603, MULVFS 26 days  
Feb 1997 F. Whitney, R/V Tully 9704, MULVFS 18 days  
July 2000 J. Sherman, R/V J H Martin, Spray test, 1 day  
Nov 2000 **Chief Scientist**, R/V Sproul, NOPP, 2 days  
Feb 2001 **Chief Scientist**, R/V Sproul, NOPP, 2 days  
Aug 2001 **Chief Scientist**, R/V New Horizon, NOPP/MULVFS, 14 days  
Jul 2002 **Chief Scientist**, R/V Sproul, NOPP, 2 days  
June 2003 J. Bullister, R/V Ron Brown A16N, Carbon Explorers, PIC sensor NOAA/ONR, 21 days  
June 2004 K. Buesseler, R/V Kilo Moana, VERTIGO Carbon flux DOE/NSF 21 days.  
July 2005 K. Buesseler, R/V Revelle VERTIGO Carbon flux DOE/NSF 42 days.

**Other Bishop - group Seagoing work**

Aug. 1996 F. Whitney, R/V Tully 9618, MULVFS 26 days (LBNL group)  
April. 2001 US Coast Guard Icebreaker Polar Star, Carbon Explorer 7 days (Todd Wood)  
Jan. 2002 K. Johnson, R/V Revelle, Carbon Explorers / MULVFS 45 days (LBNL group)  
Mar. 2004 P. Verdugo, R/V Kilo Moana, Optical carbon Flux instrument 10 days (LBNL group)  
Jan. 2005 R. Wanninkof, R/V Ron Brown, A16S. Part. Inorganic Carbon 45 days (A. Thompson)

**REFEREED PUBLICATIONS**

**Submitted: 1**

1 Lam, P.J., J.K.B. Bishop, High Biomass Low Export Regimes in the Southern Ocean. *Deep-Sea Reserch II* [LBNL# 59452].

**In Press: 1**

- 1 Glover, D.M., C.L. Chandler, S.C. Doney, K.O. Buesseler, G. Heimerdinger, J.K.B. Bishop, and G.R. Flierl. The U.S. JGOFS Data Management Experience. *Deep Sea Research II*.

**Published Papers: 48**

- 1 Lam, P.J., J.K.B. Bishop; C. C. Henning, M.A. Marcus, G. A. Waychunas, and I.Y. Fung. Wintertime phytoplankton bloom in the Subarctic Pacific supported by Continental Shelf Iron., *Global Biogeochemical Cycles*. **20**, GB1006, doi:10.1029/2005GB002557. [LBNL# 55467]
- 2 Bishop, J.K.B., T.J. Wood, R.E Davis, J.T. Sherman. (2004) Robotic Observations of Enhanced Carbon Biomass and Carbon Export at 55S During SOFeX - *Science*, 304, 417-420. [LBNL# 53136]
- 3 Bishop, J.K.B. R.E. Davis and J.T. Sherman (2002) Robotic Observations of Dust Storm Enhancement of Carbon Biomass in the North Pacific. *Science* 298, 817-821. [LBNL #50120].
- 4 Sheridan, C.C., C. Lee, S.G. Wakeham and J.K.B. Bishop (2002) Suspended particle organic composition and cycling in surface and midwaters of the equatorial Pacific Ocean. *Deep-Sea Research*. I 49 1983-2008.
- 5 Campbell, J.W., D. Antoine, R. Armstrong, K. Arrigo, W. Balch, R. Barber, M. Behrenfeld, R. Bidigare, J. Bishop, M.-E. Carr, W. Esaias, P. Falkowski, N. Hoepffner, R. Iverson, D. Kiefer, S. Lohrenz, J. Marra, A. Morel, J. Ryan, V. Vedernikov, K. Waters, C. Yentsch, and J. Yoder. (2002) Comparison of algorithms for estimating ocean primary productivity from surface chlorophyll, temperature, and irradiance. *Global Biogeochem.Cycles*, 16(3), 10.1029 / 2001GB001444 [LBNL# 48412]
- 6 Guay, C.K. and J.K.B. Bishop (2002) A rapid birefringence method for measuring suspended CaCO<sub>3</sub> concentrations in water, *Deep-Sea Research I*, 49, 197-210 [LBNL #46895].
- 7 Fung, I. Y., S.K. Meyn, I. Tegen, S.C. Doney, J.G. John, and J.K.B. Bishop (2000) Iron supply and demand in the upper ocean. *Global Biogeochemical Cycles*. V14(N1):281-295. [LBNL #44330]
- 8 Bishop, J.K.B., S.E. Calvert, and M. Y.-S. Soon (1999). Spatial and Temporal Variability of POC in the Northeast Subarctic Pacific. *Deep-Sea Research II*. 46(11-12) 2699-2733. [LBNL #44130]
- 9 Boyd, P.W., N.D. Sherry, J.A. Barges, J.K.B. Bishop, S.E. Calvert, M.A. Charette, S.J. Giovannoni, R. Goldblatt, P.J. Harrison, S.B. Moran, S. Roy, M. Soon, S. Strom, D. Thibault, K.L. Vergin, F.A. Whitney and C.S. Wong (1999). Transformations of biogenic particles from the pelagic to the deep ocean realm. *Deep-Sea Research II*. 46(11-12) 2761-2792. [LBNL # 45063]
- 10 Charette, M.A., S.B. Moran and J.K.B. Bishop (1999) <sup>234</sup>Th as a tracer of particulate organic carbon export in the subarctic Northeast Pacific Ocean. *Deep-Sea Research II* 46(11-12) 2833-2862. [LBNL #44174]
- 11 Eek, M., M.J. Whiticar, J.K.B. Bishop and C.S. Wong. (1999) Carbon Isotope Composition of Alkenones along Line P - NE Pacific: Effects of pCO<sub>2</sub>, Nutrients and Temperature. *Deep-Sea Research II* 46(11-12) 2863-2876. [LBNL #45076]
- 12 Thibault, D., S. Roy, C.S. Wong, and J.K.B. Bishop (1999). The Downward Flux of biogenic material in the NE subarctic Pacific: importance of algal sinking and mesozooplankton herbivory. *Deep-Sea Research II*. 46(11-12) 2669-2698. [LBNL #46479]
- 13 Bishop, J.K.B. (1999) Transmissometer Measurement of POC. *Deep-Sea Research I*. 46(2) 353-369. [LBNL# 43996]
- 14 Bishop, J.K.B., W.B. Rossow and E.G. Dutton (1997) Surface Solar Irradiance from ISCCP 1983-1991. *J. Geophys. Res. (Atmospheres)*, 102, 6883-6910.
- 15 Dunne, J.P., J.W. Murray, J. Young, L.S. Balistrieri, and J.K.B. Bishop, (1997) <sup>234</sup>Th and particle cycling in the central equatorial Pacific. *Deep-Sea Research II*. 44 2049-2084.
- 16 McLaughlin, F.A., Carmack, E.C., Macdonald, R.W. and Bishop, J.K.B. (1996), Physical and Geochemical Properties across the Atlantic/Pacific water mass front in the southern Canadian Basin. *J. Geophys. Res.* 101 (C1) 1183-1197.
- 17 Jeandel, C., Bishop, J.K.B. and Zindler, A.N. (1995). Exchange of Neodymium and its isotopes between seawater, small and large particles in the Sargasso Sea. *Geochimica. et Cosmochimica Acta*. 59, 535-547.
- 18 Luo, S., T.L. Ku, M. Kusakabe, J.K.B. Bishop and Y.L. Yang (1995) Tracing particle cycling in the upper ocean with <sup>230</sup>Th and <sup>228</sup>Th - an investigation in the equatorial Pacific along 140 W. *Deep Sea Research II*, 42 805-829.

- 19 Ku, T.L., S. Luo, M. Kusakabe, and J.K.B. Bishop (1995). <sup>228</sup>Ra-derived nutrient budgets in the upper equatorial Pacific and the role of "new" silicate in limiting productivity. *Deep Sea Research II*. 42, 479-497.
- 20 Liu W.T., Zhang, A, and J.K.B. Bishop (1994). Evaporation and solar irradiance as regulator of sea surface temperature in annual and interannual changes. *J. Geophys. Res.*, 99 (C6), 12,623-12,637.
- 21 Bishop, J.K.B., Smith, R.C. and Baker, K., (1992) Springtime distributions and variability of biogenic particulate matter in Gulf Stream warm-core ring 82B and surrounding N.W. Atlantic waters. *Deep-Sea Research*. 39 (1A) s295-s326.
- 22 Joyce, T.M., Bishop, J.K.B., and Brown, O.B., (1992) Observations of offshore shelf-water transport induced by a warm-core ring. *Deep-Sea Research*. 39 (1A), s97-s114.
- 23 Altabet, M.A., Bishop, J.K.B., and McCarthy, J.J. (1992) Differences in particulate nitrogen concentration and isotope composition for samples collected by bottles and large-volume pumps in Gulf Stream warm-core rings and the Sargasso Sea. *Deep-Sea Research*. 39 (1A), s405-s417.
- 24 Mitchell, B.G., E. Brody, O. Holm-Hansen, C. McClain, J.K.B. Bishop, (1991) Light limitation of phytoplankton biomass and macronutrient utilization in the Southern Ocean. *Limnol. & Oceanogr.* 36(8) 1662-1677.
- 25 Bishop, J.K.B. and W.B. Rossow. (1991) Spatial and temporal variability of global surface solar irradiance. *J. Geophys. Res.*, 96 (C9), 16,839-16,858.
- 26 Bishop, J.K.B. (1991) Getting good weight. in: *Marine Particles: Analysis and Characterization*. D.C. Hurd and D.W. Spencer, eds., Geophysical Monograph 63, 229-234. American Geophysical Union.
- 27 Bishop, J.K.B., (1990) Determination of Ba in seawater using Vanadium/Silicon modifier and direct injection graphite furnace atomic absorption spectrometry. *Analytical Chemistry*. 62, 553-557.
- 28 Bishop, J.K.B. (1989) Regional extremes in particulate matter composition and flux: effects on the chemistry of the ocean interior. In Berger, W.H., Smetacek, V.S., and Wefer, G. eds. Productivity of the ocean present and past. Dahlem Konferenzen. Chichester: John Wiley and Sons Ltd.. pp 117-137.
- 29 Bishop, J.K.B. (1988) The barite-opal-organic carbon association in oceanic particulate matter. *Nature* 332, 341-343.
- 30 Conte, M.H. and J.K.B. Bishop (1988) Nanogram quantification of lipid classes in oceanic particles by high-performance thin layer chromatography. *Lipids* 23, 493-500.
- 31 Bishop, J.K.B. and M.Q. Fleisher (1987) Particulate manganese dynamics in Gulf Stream warm-core rings and surrounding waters of the N.W. Atlantic. *Geochimica et Cosmochimica Acta* 51(10), 2807-2826.
- 32 Bishop, J.K.B., J.C. Stepien, and P.H. Wiebe (1987) Particulate matter distributions, chemistry and flux in the Panama Basin: response to environmental forcing. *Progress in Oceanography* 17, 1-59.
- 33 Marra, J., P.H. Wiebe, J.K.B. Bishop, and J.C. Stepien (1987) Primary production and grazing in the plankton of the Panama Bight. *Bulletin of Marine Science* 40, 255-270.
- 34 Bishop, J.K.B., M.H. Conte, P. Wiebe, M. Roman and C. Langdon (1986) Particulate matter production and consumption in deep mixed layers: Observations in a warm core ring. *Deep-Sea Research* 33, 1813-1841.
- 35 Bishop, J.K.B. and T.M. Joyce (1986) Spatial distributions and variability of suspended particulate Matter in Warm Core Ring 82B. *Deep-Sea Research* 33, 1741-1760.
- 36 Conte, M.H., J.K.B. Bishop, and R. Backus (1986) 12-KHZ non-migratory deep scattering layers of Sargasso Sea origin in warm core rings. *Deep-Sea Research*, 33, 1869-1884.
- 37 Bishop, J.K.B. (1986) The correction and suspended mass calibration of Sea Tech transmissometer data. *Deep-Sea Research* 33, 121-134.
- 38 Be, A.W.H., J.K.B. Bishop, M. Sverdrlove and W. Gardner (1985) Standing stock, vertical distribution and flux of planktonic foraminifera in the Panama Basin. *Marine Micropaleontology* 9, 307-333.
- 39 Bishop, J.K.B., D. Schupack, R.M. Sherrell and M. Conte (1985) A Multiple Unit Large Volume in-situ Filtration System (MULVFS) for sampling oceanic particulate matter in mesoscale environments. In: A. Zirino, ed., Mapping Strategies in Chemical Oceanography, Advances in Chemistry Series, Vol. 209, American Chemical Society, Washington, D. C., 155-175.
- 40 Lambert, C.E., J.K.B. Bishop, P.E. Biscaye and R. Chesselet (1984) Particulate aluminum, Iron and Manganese as indicators of resuspension processes in the Deep Atlantic. *Earth and Planetary Science Letters* 70, 237-248.

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- 41 Bishop, J.K.B., and J. Marra (1984) Variations in primary production and particle flux through the base of the euphotic zone at the site of the Sediment Trap intercomparison Experiment (Panama Basin). *Journal of Marine Research* 42, 189-206.
- 42 Gardner, W.D., J.K.B. Bishop and P.E. Biscaye (1984) Nephelometer observations at the STIE site, Panama Basin. *Journal of Marine Research* 42, 207-219.
- 43 Bishop, J.K.B. and P.E. Biscaye (1982) Chemical Characterization of individual particles from the nepheloid layer in the Atlantic Ocean. *Earth and Planetary Science Letters* 58, 265-275.
- 44 Bishop, J.K.B., R.W. Collier, D.R. Ketten, J.M. Edmond (1980) The Chemistry, biology and vertical flux of particulate matter from the upper 1500 m of the Panama Basin. *Deep-Sea Research* 27A, 615-640.
- 45 Bishop, J.K.B., D.R. Ketten and J.M. Edmond (1978) The chemistry, biology and vertical flux of particulate matter from the upper 400 m of the Cape Basin in the S.E. Atlantic Ocean. *Deep-Sea Research*. 25, 1121-1161.
- 46 Bishop, J.K.B., J.M. Edmond, D.R. Ketten, M.P. Bacon and W.B. Silker (1977) The chemistry, biology, and vertical flux of particulate matter from the upper 400 m of the equatorial Atlantic Ocean. *Deep-Sea Research* 24, 511-548.
- 47 Bishop, J.K.B., J.M. Edmond (1976) A new large volume filtration system for the sampling of oceanic particulate matter. *Journal of Marine Research* 34, 181-198.
- 48 Bishop, J.K.B., W.R. Cullin, M.C.L. Gerry (1971) <sup>35</sup>Cl Nuclear quadropole resonance of some phosphorus chlorine compounds. *Canadian Journal of Chemistry* 49, 3910-3913.

### **Patents**

- 1 Bishop, J.K.B. and C.K. Guay (2000) Patent Disclosure: JIB-1595: An in-situ optical sensor for measuring particulate inorganic carbon in seawater. Appliation # 10/215518 - pending issue Mar 2006.
- 2 Bishop, J.K.B. (2005) Patent Disclosure IB-2196. Optical Sedimentation Recorder

### **Data Reports/Data Sets/Documentation: 6**

- 1 Flierl, G.R., Bishop, J.K.B., Glover, D.M. and Paranjpe, S., Data Management for JGOFS: Theory and Design. (<http://www1.whoi.edu/jgofs.html>).
- 2 Bishop, J.K.B., BR2 data set on surface solar irradiance July 1 1983 - June 30 1991, daily values, 2.5 degree x 2.5 degree gridded data set. see... <http://www.ucar.edu/dss/datasets/ds741.0.html> (November 1994).
- 3 Bishop, J.K.B., McLaren, J., Garraffo, Z., and Rossow, W.B. Documentation and description of surface solar irradiance data sets produced for SeaWiFS. In postscript. 23 pp. Posted to the GISS web page: <http://www.giss.nasa.gov/Data/SeaWiFS>. October 1994.
- 4 Liu, T.W., J.K.B. Bishop, W.B. Rossow and K. Case (1993) Monthly Maps of Ocean Surface Thermal Forcing. 1987-1991. JPL Publication 93-13, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California 17 pp.
- 5 Bishop, J.K.B., T.J. Wood, R.E Davis, J.T. Sherman. (2004) SUPPLEMENTAL ON-LINE MATERIALS: Robotic Observations of Enhanced Carbon Biomass and Carbon Export at 55S During SOFeX - *Science*, 304, 417-420.; [LBNL# 53136a] - peer reviewed
- 6 Bishop, J.K.B. R.E. Davis and J.T. Sherman (2002) SUPPLEMENTAL ON-LINE MATERIALS: Robotic Observations of Dust Storm Enhancement of Carbon Biomass in the North Pacific. *Science* 298, 817-821. [LBNL #50120a] - peer reviewed.

### **Planning Documents, Conference/Workshop proceedings: 12**

- 1 Doney S.C., R. anderson, J. K. B. Bishop, K. Caldeira, C. Carlson, M.E. Carr, R. Feely, M. Hood, C. Hopkinson, R. Jahnke, D. Karl, J. Kleypas, C. Lee, R. Letelier, C. McClean, C. sabine, J. Sarmiento, B. Stephens, R. Weller. (2004) Ocean Carbon and Climate Change (OCCC)" An Implementation Strategy for U. S. Ocean Carbon Research. UCAR 108pp.
- 2 Lam, P., and J.K.B. Bishop (2002) "Colloids in the Upper Ocean". DOE nano sciences workshop, LBNL.
- 3 Bishop, J.K.B. "Robotic observations of carbon cycle processes in remote and very stormy oceans." **Key note** presentation IGBP/JGOFS and IGBP/GAIM workshop - Measurements and Modelling of Global Ocean Productivity and Biogeochemical Fluxes", Ispra, Italy.
- 4 Lam, P.J, J.K.B. Bishop, G.A. Waychunas, S. Sutton, "Characterization of Fe in marine particles via micro-XAS: possibilities and limitations. 2001 Annual Report, Advanced Photon Source, Argonne National Laboratory. 2pp.

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- 5 Bishop, J.K.B., Guay, C.K., Sherman, J.T., Moore, C.C., and R.E. Davis (2001) Prospects for a "C-Argo": A new approach for exploring ocean carbon system variability. Extended Abstract 01-07, International Workshop on Autonomous Measurements of Biogeochemical Parameters in the Ocean, Honolulu, Hawaii. Sponsors: Japan Ministry of Education, Culture, Sports, Science and Technology and Japan: National Institute for Resources and Environment (NIRE). Feb 20-22 2001. 6 pp.
- 6 Moore, C.C., Bishop, J.K.B., Perry, M.J., Ericksen, C.C., Donaghay, P.L., Hanson, A.K., and M.M. Deksheniaks (2001). Progress in optical sensors for biogeochemical measurements on autonomous platforms. Extended Abstract 02-01, International Workshop on Autonomous Measurements of Biogeochemical Parameters in the Ocean, Honolulu, Hawaii. Sponsors: Japan Ministry of Education, Culture, Sports, Science and Technology and Japan: National Institute for Resources and Environment (NIRE). Feb 20-22 2001.
- 7 Bishop, J.K.B. and Davis, R. E. (2000) Autonomous Observing Strategies for the Ocean Carbon Cycle. In ENERGY 2000, The beginning of a new millennium.. Eds. P. Catania, B. Golchert, C. Zhou, Publ. Balaban International Science Services, L'Aquila, Italy. pp 1256-1261. ISBN 1-58716-016-1.
- 8 Benson, S. Dorchak, T. Jacobs, G., Ekmann, J., Bishop, J.K.B., Grahame, T. (2000) Carbon dioxide reuse and sequestration: the state of the art today. In, ENERGY 2000, The State of the Art. Ed. P. Catania, Publ. Balaban International Science Services, L'Aquila, Italy. pp 205-226.. ISBN 086689-05-56.
- 9 Bishop, J.K.B. (2000) Strategies for Quantifying Global Ocean Carbon Dynamics in the Forbidden Zone. Ocean Carbon Transport, Exchanges and Transformations (OCTET). Proceedings of a workshop sponsored by NSF, NOAA and NASA. March 7-10, 2000. p 65-74.
- 10 Boyd, P., J.K.B. Bishop, F. Whitney (1997) Canadian JGOFS completes second phase of studies in the northeast Pacific. JGOFS Newsletter, 8, 8-9.
- 11 Bishop, J.K.B., W.B. Rossow and E.G. Dutton (1996) Clouds, Aerosols, and the Temporal and Spatial Variability of Surface Solar Irradiance: Surface flux validation for SeaWiFS. Proc. International Workshop on Research Uses of ISCCP data sets. GISS/GSFC April 15-18 1996. New York.
- 12 Bruland, K.W., Bienfang, P.K., Bishop, J.K.B., Eglinton, G., Ittekkot, V.A.W., Lampitt, R., Sarnthein, M., Thiede, J., Walsh, J.J., and Wefer, G. (1989). Group Report: Flux to the Seafloor. In Berger, W.H., Smetacek, V.S., and Wefer, G. eds. Productivity of the ocean present and past. Dahlem Konferenzen. Chichester: John Wiley and Sons Ltd., 193-215.

### **PUBLICATIONS Abstracts: 85**

- 1 Bishop, J.K.B., S.E. Wilson, and T.J. Wood (2006) Optical assessment of particles and sedimentation processes of the Twilight Zone. *Eos Trans. AGU. 87(36), Ocean Sci. Meet. Suppl. OS32H-06.*
- 2 Lam, P.J., J.K.B. Bishop (2006) Ballasting and Remineralization of POC in the Twiliight Zone of the Southern Ocean. *Eos Trans. AGU. 87(36), Ocean Sci. Meet. Suppl. OS24H-05.*
- 3 Wood, T. J., J.K.B. Bishop (2006). New Views of the Oceanic Carbon Cycle from Autonomous Explorers. *Eos Trans. AGU. 87(36), Ocean Sci. Meet. Suppl.. OS53B-05.*
- 4 Buesseler, K., J.K.B. Bishop, P. Boyd, K. Casciotti, F. Dehairs, C.H. Lambourg, D. Siegel, M. Silver, D. Steinberg, S. Saito, T. Trull, J. Valdes, B. Van Mooy (2006). What we know from VERTIGO. *Eos Trans. AGU. 87(36), Ocean Sci. Meet. Suppl.. OS22H-02.*
- 5 Dehairs, F., S. Jacquet, N. Savoy, D. Cardinal, W. Bayens, and J. Bishop (2006) Particulate Ba at station ALOHA during VERTIGO I. *Eos Trans. AGU. 87(36), Ocean Sci. Meet. Suppl.. OS23H-03.*
- 6 Lamborg, C.H., Buesseler, K.O., Valdes, J. , Bishop, J.K.B., Casciotti, K.L., Trull, T., Pike, S.M. (2006) , A comparison of remineralization time and space scales for sinking particles at station ALOHA. *Eos Trans. AGU. 87(36), Ocean Sci. Meet. Suppl. OS23H-02.*
- 7 Bishop, J.K.B. (2005) New Views of the Oceanic Carbon Cycle from Autonomous Explorers. Seventh International Carbon Dioxide Conference, Boulder, CO. Sept. 2005.
- 8 Lamborg, C.H., Buesseler, K.O., Valdes, J. ,Trull, T., Bishop, J.K.B., Casciotti, K.L., Pike, S.M. Andrews, J.E. III, Manganini, S.J., Bertrand, C. (2005) Element fluxes and recycling during VERTIGO 04: Preliminary Results. SS84-79: Multi-tracer Approaches Towards Understanding Paritcle Fluxes and Dynamics in the Sea. ALSO meeting, June 19-24 2005. Santiago de Compostela, Spain.
- 9 Bishop, J.K.B., Wood, T.J., Lam, P.J. (2005) Autonomous Assessment of the Ocean Carbon Cycle: Prospects for a Carbon ARGO. Invited Poster. International Ocean Research Convergence, UNESCO, Paris, France. June 2005.

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- 10 Bishop, J.K.B. (2005) Autonomous Assessment and Understanding of the Ocean Carbon Cycle: Prospects for a Carbon ARGO. Poster. NASA Ocean Color Research Team Meeting, Portland, OR April 24-28 2005.
- 11 Bishop, J.K.B. (2005) Autonomous Monitoring of Ocean Carbon Biomass and Sedimentation. Invited. American Chemical Society, Symposium on Ocean Instrumentation, ACS meeting, San Diego, CA, March 16 2005.
- 12 Bishop, J.K.B. (2005) Autonomous Ocean Carbon Measurement, Monitoring, and Verification: A Vision. *Chapman Conference on The Science and Technology of Carbon Sequestration*. San Diego, CA Jan 16-20 2005.
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## **COURSES TAUGHT**

### **UC Berkeley, Dept of Earth and Planetary Science**

**EPS 82C Introduction to Oceans (2)** The geology, physics, chemistry, and biology of the world oceans. The application of oceanographic sciences to human problems will be explored through special topics such as energy from the sea, marine pollution, food from the sea, and climate change. Also listed as Integrative Biology C82. (Fall 2003; co taught with Professor Powell (IB)/ Fall 2004, co-taught with Professor Ingram (EPS); Expected, Sept 2006)

EPS/IB C82 has students with very diverse backgrounds (athletes to science majors). Aim of the course is give students a working vocabulary of the ocean and it's role in day to day life. We aim to engage the entire group. Where possible, I 'bring alive' material from the course by introducing lectures with a brief overview of a current ocean news item from the recent popular press.

This class was taught to 230 students in 2003; class size doubled to ~430 in 2004. The median grade in 2003 (before curving was 50%). The median grade in 2004 was over 70% no curving required. The gain in performance reflects structural changes to the course based on 2003 experience.

**EPS 103/203. Introduction to Marine Geochemistry.** (3) Three hours of lecture per week. Prerequisites: EPS 50, Chemistry 1A-1B, Mathematics 1A-1B, and Physics 7A. Course covers the global water cycle; major processes governing the distribution of chemical species within the hydrosphere; mass balances, fluxes, and reactions in the marine environment from global to submicron scales; relationships to physical, biological, and geological processes; geochemical tracers and tools. The aim of this course is to build 'vocabulary' in marine geochemistry for students interested in Marine sciences (*new* Fall 2000; Fall 2002) Bishop 100%. (Expected spring 2006)

Fall 2002 Evaluation 103. Teaching effectiveness 4.67/5.00. Course Comparison: ranked top 5% (range best to top 10%) by undergraduates. Ranked top 2 compared with 13 EPS upper level courses taught the same term. Improved from 2000.

### **University of Victoria, School of Earth and Ocean Sciences**

EOS 240 - Introduction to Geochemistry (50% effort) [S 1994, S 1995, S 1997]

Textbooks: various including Berner and Berner - Global Water Cycle. Includes a laboratory and field program study of the anoxic water column and sediments in Saanich Inlet.

EOS 425\* - Aqueous Geochemistry and the Environment (100%) [New F 1996]

Textbook: Morel and Hering: Principles and Applications of Aquatic Chemistry

MINEQL+ software. Laboratory and Field study of the geochemistry of Lake Cowichan - Mass Balance - pH, alkalinity - CO<sub>2</sub> system, Si, ICP-MS elements - regional geological context.

EOS 430/537\* - Isotope and Tracer Geochemistry (75% effort) [New F 1995, F 1996]

Textbook: Faure - Isotope Geology and current literature. Includes laboratory on isotope dilution analysis (Ba and Pb) by ICP-MS.

EOS 503 - Global Biogeochemical Cycles (50%) [S 1994, S 1995].

Textbooks: Marine Biogeochemistry - Libes; Global Water Cycle - Berner and Berner.

Current literature.

## **STUDENTS/Mentoring**

### **Current students.**

Jeffrey Dick - PhD - (2000- ) (2nd proposal - Ocean phosphorus dynamics). UC Berkeley, EPS, Preorals advisor.

## **Graduated students.**

### **Graduate:**

- Phoebe Lam - PhD (2005) Marine Particulate Matter in the Twilight Zone: Insights on Iron Cycling and Remineralization of Particulate Organic Carbon in the Ocean. UC Berkley, Department of Earth and Planetary Science, 178pp: Committee chair and principal advisor [LBNL #59338].
- Sun Young Park - PhD - (2000-2005) atmospheric chemistry (2nd Proposal - DOC sensor), UC Berkeley, EPS, Preorals advisor.
- Bubnov, P. - M.Sc. (2001). Particulate organic carbon variability in the subarctic Pacific based on transmissometer data - University of Victoria, BC, Canada: Supervisor.
- Eek, M. (Ph.D.; 2000) methane/ biomarker geochemistry. University of Victoria, BC, Canada. Committee member.
- Lu, Beiwei - M.Sc. (1999). Zooplankton distribution along the shelf break off Vancouver Island and its relationship with currents. 80pp. - University of Victoria, BC, Canada. committee member.
- McLaughlin, F. - M.Sc. (1996) Geochemical and physical water mass properties and holocarbon ventilation in the southern Canadian Basin of the Arctic Ocean. 219pp - School of Earth and Ocean Sciences, University of Victoria, Victoria, BC, Canada. - supervisor.
- Maureen H. Conte.- PhD (1989) "The biogeochemistry of particulate lipids in Warm Core Gulf Stream Ring Systems". Columbia University, 584 pp. - Columbia University. - supervisor.
- Sherrell, R. - Ph.D. (1989) The trace metal geochemistry of suspended oceanic particulate matter. MIT/WHOI. 211 pp. - committee member/external examiner.

### **Undergraduate students (U Victoria).**

- Connys, A. - B.Sc. (hon) (1998). The Geochemistry of Vancouver Island Natural Waters. Case study: Sooke Lake Reservoir. 142 pp. University of Victoria, Victoria, BC, Canada. - supervisor.
- Sinnott, G. - B.Sc. (hon) (1998). Ground water Flow and Contaminant Transport Modelling of the Burgoyne Bay Septage Facility, Saltspring Island, British Columbia. 90 pp. University of Victoria, Victoria, BC, Canada. - supervisor.
- deLeeuw, S. - B.Sc. (hon) (1997). Particulate biogenic silica dynamics in the North Pacific. University of Victoria, Victoria, BC, Canada. - supervisor.

### **Undergraduate Interns (at LBNL)**

- Brendan Carter (UC Berkeley) - Now Graduate Student at Scripps (2004).
- Lewis Hsu (UC Berkeley)
- Greg Hierson (UC Berkeley)

## **Other**

### **Laboratory Science Teacher Professional Development Program (R. Otto)**

Jennifer Howard. (June-August 2005).

### **High School Student Mentoring (HSSRP at LBNL)**

Monson, Oliver (2002) - Assisted in laboratory and at sea R/V Sproul (July 2002).

Lyra Piorotti (2003) - Analysis of remote sensing data in support of Ron Brown Expedition. ICP-MS determination of Ba.

## **POSTDOCTORAL FELLOWS**

- Alexandra Thompson (2005) UC Berkeley, Miller Postdoctoral Fellow. Co-sponsor. Led LBNL sampling program in Southern Ocean January-February 2005.
- Cara Henning (Oct 2004 -) The physical oceanography of the carbon explorers program. Biogeochemical modelling. (50% at LBNL; 50% with Fung UCB).
- Christopher Guay (Ph.D. OSU, July 1999). August 1999-October 2001. Two year NOAA Climate Dynamics Postdoctoral Fellowship to develop advanced underwater sensors for carbon system parameters.
- Christopher Still (Ph.D. Stanford university; June 2000-May 2001. DOE Hollaender Fellow (with Inez Fung). Terrestrial carbon cycle modelling.

**Recent Invitations / Seminars / Public Outreach**

Seminars

May 6 2005: Robotic Exploration of Ocean Carbon and Export Dynamics: "Close Encounters of the Ice Kind" and other stories. Invited Seminar. Dept of Environmental Engineering, Stanford University.

April 25 2005: Robotic Exploration of Ocean Carbon and Export Dynamics: "Close Encounters of the Ice Kind" and other stories. Invited Seminar. Geochemistry Seminar, Scripps Institution of Oceanography, UC San Diego

Invited Talks (declined due to seagoing commitment)

On Future for Ocean Carbon Observations: (Invited by Scott Doney, WHOI)

"The Ocean Carbon System: Recent Advances and Future Opportunities": An Ocean Carbon and Climate Change (OCCC) Workshop for August 1-4, 2005 at the Woods Hole Oceanographic Institution (Woods Hole, MA).

Carbon Explorer Science: (Invited by Claire Reimers, OSU)  
2005 Gordon Research Conference on Chemical Oceanography, August 7-12 2005.

Public Outreach: Web and Print Media:

March 2006. Chemistry World: Extreme Analysis. Royal Society of Chemistry. UK  
<http://www.rsc.org/chemistryworld/Issues/2006/March/ExtremeAnalysis.asp>

May 15 2005: Sampling the South Atlantic, by Paul Pruess  
<http://www.lbl.gov/Science-Articles/Archive/sabl/2005/May/03-sampling.html>

Aug 2004. Interviewd (not quoted): Ironing out an idea. Rei Ueyama, August 2004.  
<http://www.sacbee.com/content/news/science/story/10397389p-11317077c.html>

July 2004. American Society for Microbiology, Anna Gillis.

**FUNDED RESEARCH (Bishop PI) AT LBNL (1998-present)**

National Oceanic Partnership Program (Office of Naval Research/NSF)

1999 -2003 Autonomous Profilers for Carbon-System and Biological Observations

DOE Office of Science, OBER

1999-2002 DOE Center for Research on Ocean Carbon Sequestration

2000-2003 Autonomous Strategies for Measurement of Global Ocean Carbon Flux

2003-2006 Autonomous Assessment of Ocean Carbon Flux (renewal above)

2002-2005 Ocean Carbon Dynamics and Transfer Processes: SOFEX and Beyond

2006 One year funded extension of SOFeX and Beyond.

NASA

1997-2002 Computation and Validation of Surface Solar Irradiance From ISCCP data

NOAA

2000- 2003 Autonomous Strategies for a Global Carbon Cycle Monitoring System

2003 -2007 Exploration, Assessment, and Understanding of Oceanic  
Particulate Organic and Inorganic Carbon

LBNL LDRD

1998-2000 Ocean Particulate Carbon Dynamics

2001 Computer Tools and Methods for Demonstrating a Robotic Ocean Carbon Observing System

2004-2006 Autonomous Sensor for Dissolved Organic Matter (Strategic - with Engineering).

UC Berkeley

2003-2004 Iron Dynamics and Modelling.