

## CURRICULUM VITAE

Comment [j1]: Updated Oct 2009

**Name:** John Charles Priscu

**Birthdate:** September 20, 1952

**Citizenship:** U.S.A.

### **EDUCATION:**

Ph.D., Ecology (Microbial), Univ. of California, Davis, 1982  
M.S., Biology (Limnology), Univ. of Nevada, Las Vegas, 1978  
B.S., Biology (minor music), Univ. of Nevada, Las Vegas, 1975

### **PROFESSIONAL EXPERIENCE:**

Professor of Ecology, 2000-present. Department of Land Resources and Environmental Sciences, Montana State University.

Professor of Ecology. 1994-2000. Department of Biological Sciences, Montana State University.

Associate Professor of Ecology. 1988-1994. Department of Biological Sciences, Montana State University.

Assistant Professor of Ecology. 1984-1988. Department of Biological Sciences, Montana State University.

Search Committee for the Editor-in-Chief of the AGU publication JGR-Biogeosciences. 2008-2009.

Polar Research Board-National Academy of Science. 2009-2012.

Committee on the Origin and Evolution of Life -National Academy of Science. 2008-2011.

Editorial Board. Astrobiology. 2006-present.

Chair, SCAR-SALE (Subglacial Antarctic Lake Environments) Scientific Planning Group. 2007-present.

Co-chair of the scientific international organizing committee for the SCAR Open Science Conference, August 2010, Buenos Aires, Argentina, August 2010.

Organizing Committee, Subglacial Antarctic Lake Exploration (SALE) Advanced Science and Technology Workshop, April 24-28, 2006. LGGE, Grenoble France

Instructor "Limnology in High Alpine Lakes" University of Innsbruck, Austria. July 2000.

Project Leader (Principal Investigator), Antarctic Research Teams. 1984-present.

Organizing Committee, NSF funded FASTDRILL workshop. October 2002.

Organizing Committee, American Society of Limnology and Oceanography winter meeting, Salt Lake City. February 2003.

Participant and discussion leader, National Science Foundation Workshop "Emerging Research Questions for Limnology: The Study of Inland Waters. December 2002.

National Science Foundation Office Advisory Committee for the Office of Polar Programs. 2000-2002.

National Science Foundation Advisory Committee for Environmental Research and Education 2000-2002.

United States Biology representative to the Scientific Committee of Antarctic Research (SCAR). 2000-2006.

Convener for the international Group of Specialists to plan the exploration of Lake Vostok and other subglacial lakes. 2000-2006.

National Academy of Sciences NRC Committee "Frontiers in Polar Research". 2002-2003.

National Academy of Sciences NRC Committee "Forward Contamination of Mars" 2004-2006.

United States Ice Core Working Group member. 2002-2008.

Advisory Committee for the United States Ice Core Drilling Services. 2002-2008.

Participant and rapporteur. American Society of Limnology and Oceanography/NSF funded workshop on Emerging Issues in Limnology. Boulder, CO. December 2002.

Review Committee, Public Radio Documentary Series "The DNA Files". 2000-2001.

Sponsor for the NASA Planetary Biology Internship Program. 2000-present.

Sponsor for NASA GSRP and Space Grant Consortium students. 1997-present.

Sponsor for NASA Montana Space Grant Consortium students. 1996-present.

Team member, Lake Baikal, USSR expedition, July-August, 1990. Funded by the National Geographic Society.

Team member, International expedition to study the physics, chemistry and biology of southern Patagonian lakes, March 1992. Funded by German Government.

Editorial Board, American Geophysical Union, Antarctic Research Series. 1993-2002.

Editorial Board, Limnology and Oceanography. 1988-1991.

NSF Review Panel, Division of Polar Biology and Medicine 1990, 1993.

NSF Review Panel, Life in Extreme Environments (LEn) Program 1999.

Chairperson, McMurdo (Antarctica) Area Scientific Users Committee 1995-present.

Organizing Committee and Working Group Chairman, Environmental Management Workshop on the McMurdo Dry Valleys (Antarctica). 14-17 March 1995, Sante Fe, New Mexico. Funded by NSF.

Chairperson, Winter Research in Antarctica Workshop. 7-9 September 1999. NSF headquarters, Arlington Virginia. Funded by NSF.

Biological Cruise Leader. Cruise II-87, USCG Icebreaker "Polar Sea", February 1987. This cruise examined the influence of nutrients on phytoplankton C and N metabolism off the Ross Ice Shelf, Antarctica. Funded by NSF Division of Polar Programs.

Adjunct Research Professor. University of Southern California Biological Oceanography Program in conjunction with NASA, 1986-1987. Research topic: Influence of environmental variables on nitrogen enzymology in Antarctic sea-ice microalgae. Funded by NSF Division of Polar Programs.

Adjunct Research Professor. University of Southern California Biological Oceanography Program, 1985-1986. Research topic: Physiology of Antarctic Sea-Ice Microalgae: Changes in Photosynthetic Metabolism During the Course of a Spring Bloom. Funded by NSF Division of Polar Programs.

Adjunct Research Professor. Department of Biological Sciences, University of Nevada, Las Vegas. 1984.

Research Scientist. New Zealand Antarctic Research Program. 1984-1985. Research topic: Carbon and Nitrogen metabolism of Antarctic stream and lake ecosystems. Funded by an NSF International Programs grant and a grant from the New Zealand Government.

Staff Research Scientist. 1982-1984. Division of Marine and Freshwater Science, Taupo Research Laboratory, Division of Scientific and Industrial Research, New Zealand.

Research Scientist. Cruise 1144 of RV Tangaroa, New Zealand government research vessel. 1983. Objectives: To define the importance of upwelled nitrate to phytoplankton productivity in the eastern Tasman Sea.

Leader-Primary Productivity Section: Workshop on biological production off the west coast of New Zealand. Wellington, New Zealand. Oct. 1983.

Director, Chem-Pro Consultants, Inc. 1979-Present. Environmental research in aquatic systems.

Research Assistant-Field Director, Castle Lake Research Group, Univ. of California, Davis. 1979-1981. Maintenance and operation of the Castle Lake field station and supervision of routine limnological data collection and analysis.

Instructor. 1980. Limnology laboratory, Univ. of California, Davis.

Instructor. 1978. "Ecology of a Desert Pond: Adult education course organized through the Continuing Education Department of the Univ. of Nevada, Las Vegas.

Research Associate. 1976-1978. Supervisor of field collection and analysis of routine limnological data from Lakes Mead and Mohave (Colorado River), in conjunction with the U.S. Bureau of Reclamation and the Univ. of Nevada, Las Vegas.

Research Assistant. 1976-1978. The quantification of chlorophyll in water bodies utilizing remote laser sensing. The research was in conjunction with the U.S. Environmental Protection Agency and the Univ. of Nevada, Las Vegas.

Research Assistant. 1975-1977. The effects of sewage effluent from Las Vegas Wash on water quality in Lake Mead, in conjunction with Clark County Sanitation District No. 1, Waste Treatment Physical Development Section and the Univ. of Nevada, Las Vegas.

Research Assistant. 1975. Biological control of the encephalitis mosquito Culex tarsalis. The research was in conjunction with the Clark County, Nevada Vector Control Program and the Univ. of Nevada, Las Vegas.

Teaching Assistant. 1975. General Zoology and Human Ecology. Univ. of Nevada, Las Vegas.

Research Assistant. 1974. Evaluation of the proposed Alton Coal-Slurry Pipeline on the fauna of the Moapa River, Utah-Nevada, in conjunction with Engineering Management, Inc. and the Univ. of Nevada, Las Vegas.

#### **MEMBERSHIP IN PROFESSIONAL SOCIETIES:**

The American Society of Limnology and Oceanography  
Phycological Society of America  
American Association for the Advancement of Science  
American Society for Microbiology

American Geophysical Union

**MAJOR AREA OF RESEARCH:**

Aquatic Ecosystem Ecology  
Nutrient biogeochemistry  
Microbial Ecology/Physiology  
Life in Extreme Environments  
Astrobiology

**SELECTED INVITED LECTURES:**

2009. Earth's polar regions as models for the microbiology of other frozen worlds. Plenary lecture. AMS Philadelphia 18-22 May 2009.
2008. Invited lecture. POP-Tech 2008. "The lost world beneath the Antarctic Ice Sheet". 24 October 2008, Camden, Main
2008. Invited lecture. IBM. What does polar science tell us about the evolution of life? 10 October 2008, Palo Alto, California
2008. Plenary Lecture. Subglacial Lakes and Rivers: Diversity in the cold. Third International Conference on Polar and Alpine Microbiology. 11-15 May, Banff, Canada.
2008. Invited lecture. University of Nevada, Las Vegas-2008 BIOS Lecture. "Beyond Polar Bears and Penguins: What can we Learn from Polar Science?" 11 April 2008.
2007. Philip Hauge Abelson Advancing Science Seminar (Emerging Polar Frontiers) sponsored by the American Association for the Advancement of Science (AAAS). October 2007, Washington, DC.
2007. Manion Lecture. Carrol College, Helena, Montana. How Are Our Poles Changing?" 11 April 2007.
2007. Invited Lecture. "Climate and Ecosystem Response in Earth's South Polar Regions". University of Alberta, Canada and the Ecosystem Research Institute, Alberta. April 2007.
2007. Invited Lecture. "What Can We Learn from Our Polar Regions". Madrid, Spain. Funded by Fundacion la Caixa; CosmoCaixa (National Museum of Spain). April 2007.
2006. Invited Lecture. "Icy Earth as a Model for Extraterrestrial Ecology". University of California, Davis. October. 2006.
2006. Plenary Lecture. "Subglacial Lake Exploration: From a Curiosity to Focus for Scientific Research. SCAR XXIX Open Science Conference, Hobart, Tasmania, 12-14 July 2006.
2006. Plenary Lecture "Life on Mars and Europa". Astrobiology Symposium. Washington, D.C. March 2006.
2006. Invited Lecture "Subglacial Microbial Systems". International Society of Microbial Ecology. Vienna, Austria. August 2006.

2006. Japanese National Institute of Polar Research, Toyko, Japan. Three lectures presented on life in and under permanent ice sheets. February 2006.

2005. Plenary lecture “Is There a Deep Cold Biosphere?” Meeting of the international society of subsurface microbiology. Jackson Hole, Wyoming. August 2005.

2005. C.B. van Niel Memorial Lecture, Stanford University, Hopkins Marine Station. 20 May 2005.

2004. Murdock Trust Lecture “A High School Education Plan About Living Ice” Partners in Science National Conference for High School Teachers, San Diego, CA. 16-17 January 2004.

2004. Invited Lecture “Live in a Deep Freeze” University of Southern California. 10 February 2004.

2004. Plenary Lecture “Are Earth’s Ice Caps Alive?”. Canadian Society of Microbiology, national meeting. Edmonton, Canada. 20-23 June 2004.

2004. Invited Lecture to the National Science Teachers Association “Pond Water Popsicles”. 8 July 2004. Big Sky, Montana.

2004. Invited Lecture “Antarctic Subglacial Lakes”. Water and Ice, 20th Anniversary Symposium, Swiss Committee on Polar Research, 18 September 2004. Bern, Switzerland.

2004. Invited Lecture “Earth’s Icy Biosphere”, Utah State University. 26 January 2004

2002. Plenary Lecture “Perennial Antarctic Ice: An Oasis for Life in a Polar Desert and a Model for Other Icy Worlds”. Russian Astrobiology Center, St. Petersburg, Russia. Marcy 2002.

2001. Plenary Lecture “Is there a Deep-Cold Biosphere?”. AAAS annual meeting. 15-20 February, San Francisco, California.

2001. Plenary Lecture. American Society of Microbiology “Life in Extremely Cold Environments”. 20-24 May, Orlando, Florida.

2001. D.E. Laudenbach Lecture. “What Can We Learn from Polar and Alpine Ecosystems” Univ. of Western Ontario. 2 April 2001.

2000. Invited Lecture. Geosciences lecture series-May, Princeton University, New Jersey.

1999. Invited Lecture. “Life in Ice”. Cambridge University, England.

1985. Invited Lecturer, Sigma XI Research Society. “Antarctic Lakes and Streams: Cold Desert Ecosystems”. Univ. California, Davis.

#### **HONORS AND AWARDS:**

2010. Nominated as a Fellow to the American Geophysical Union.

2008. Invited Essay by the National Science Foundation addressing Darwin’s influence on polar regions. “Origin and Evolution of Life on a Frozen Earth” [http://www.nsf.gov/news/special\\_reports/darwin/](http://www.nsf.gov/news/special_reports/darwin/)

2006. Named as a Fellow to the American Academy for the Advancement of Science (AAAS).

2004. A Valley in Antarctica named for research in Antarctica. Description follows: Priscu Valley. Antarctic I.D. 18658. 772900S 1604700E. An upland ice-free valley on the E side of Prentice Plateau in Olympus Range. The valley opens N to the head of McKelvey Valley. Named by US-ACAN (2004) after John C. Priscu, Department of Biological Sciences, Montana State University, Bozeman, MT; USAP investigator in the McMurdo Dry Valleys, 1984-2002.

2004. Nominated and accepted membership to the World Water and Climate Network (WWCN) as their advisor on Antarctic water bodies.

2004. BBC Radio interview "The Lost World", 19 January 2004.

2003. Richard P. Goldthwaite Award. Presented by the Byrd Polar Research Center for novel research in glaciology.

2000. Featured Scientist. BBC-Discovery documentary: "The Lost World: Lake Vostok".

2000. Featured Scientist. National Public Radio live broadcast -February- "Science Friday" with Ira Flatow.

1996. Robert and Nora Wiley award for meritorious research. Presented by the Montana State University Foundation.

1998. A first order stream named for research in Antarctica. Description follows: Priscu Stream. Antarctic I.D. 17354. 773900S 1624500E. Meltwater stream, 3,000 m long, flowing SW from SE end of Lacroix Glacier to the NE end of Lake Bonney in Taylor Valley, Victoria Land. Named by US-ACAN in 1996 after John C. Priscu, ecologist, Montana State University; principal investigator from 1984 on numerous studies of marine and fresh water systems in the McMurdo region and the author of numerous papers on the ecology of this area; led first WINFLY expedition (1991) into the McMurdo Dry Valleys.

1989. Alexander von Humboldt Foundation research scholarship to study at the Limnology Institute, University of Constance, Germany.

1989. Fulbright Foundation research scholarship to study at the Limnology Institute, University of Constance, Germany. Declined.

1987. Invited participant in the National Science Foundation sponsored workshop "Complex Ecological Interactions in Freshwater Ecosystems", held at the University of Notre Dame, March 1987.

1987. Antarctic service medal from the Secretary of the Navy for field exploration in Antarctica.

1987. Antarctic service medal from the National Science Foundation for scientific exploration in Antarctica.

1979. Jastro-Shields Research Scholarship, Univ. of California, Davis.

1976, 1977. Selected to participate in research on the natural history of Baja, Mexico. Sponsored by the Univ. of Nevada, Las Vegas Biology and Geology Departments.

1975. Selected by the Who's Who Among Students in American Universities and Colleges Selection Committee as a Candidate for their annual publication.

1975. Continuing education scholarship from the Univ. of Nevada to study the natural history of the Grand Canyon.

1975. Continuing education scholarship from the Univ. of Nevada to study the migration and mating patterns of the Gray Whale and Elephant Seal along the west coast of Baja, Mexico.

1972-1976. Captain, University of Nevada Las Vegas, soccer team.

1976-1978. Captain, Vegas United semiprofessional soccer team.

### **SCIENTIFIC PRESENTATIONS**

Over 250 oral presentations and posters presented at national and international meetings since 1985.

### **SCIENTIFIC PUBLICATIONS:**

#### **Books:**

Chyba, C. et al. 2005. Prevention of the Forward Contamination of Mars. The National Academies Press, Washington D.C. 167p.

Detrich, H.W., J.W. Deming, C. Fraser, J.T. Holibaugh, W.M. Mohn, J.C. Priscu, G.N. Somero, M.F. Thomashow and D. H. Wall. 2003. Frontiers in Polar Biology in the Genomic Era. The National Academies Press, Washington D.C. 166p.

Priscu, J.C. (oversight editor). 2003. Biogeochemistry of the Ross Sea. Vol. 78. American Geophysical Union, Washington, DC. 358p.

Priscu, J.C. (editor) 1998. Ecosystem Dynamics in a Polar Desert: the McMurdo Dry Valleys, Antarctica. Vol 72. American Geophysical Union, Washington, DC. 369 pp, includes CDROM.

Priscu, J.C. (oversight editor). 1998. Sea Ice Microbial Communities. Vol. 73. American Geophysical Union, Washington, DC. 198 pp.

Priscu, J.C. (oversight editor). 1996. Foundations for Ecosystem Research: The Palmer Peninsula, Antarctica. Vol. 70. American Geophysical Union, Washington, DC. 448 pp.

#### **Refereed–Journal Articles:**

Herbei, R. Lyons, W.B., Laybourn-Parry, J., Gardner, C., Priscu, J.C., McKnight, D. M. Physiochemical Properties Influencing Biomass Abundance and Primary Production in Lake Hoare, Antarctica. Ecological Modeling, Submitted.

Takacs-Vesbach, C., Zeglin, L. and Priscu, J.C. Microbial diversity in the McMurdo Dry Valleys, Antarctica. In, McKnight, D.M. and Doran, P.T (eds.) The McMurdo Dry Valleys as Analogues for other Cold Planets. Oxford Press. Submitted.

Samarkin1, V.A., M.T. Madigan, M.W. Bowles, K.L. Casciotti, J.C. Priscu, C.P. Kay, and S.B. Joye. Abiotic nitrous oxide production in a hypersaline environment, Don Juan Pond, Antarctica. Nature. Submitted.

Priscu, J.C. 2009. Life at the ends of the Earth. Bioscience 59:709-710.

- Wadham, J.L., Tranter, M., Skidmore, M., Hodson, A.J., Priscu, J.C., Lyons, W.B., Sharp, M., Wynn, P., Jackson, M. Biogeochemical weathering under ice: size matters. *Nature-Geochemistry*. In prep.
- Murray, A.E., F. Kenig, C.H. Fritsen, C.P. McKay, K.M. Cawley, D.M. McKnight, V. Samarkin, A. Ponce, P.T. Yung, P. Wagh, V. Peng, J.C. Priscu, P.T. Doran. 2009. Microbial Life at -13 °C in the Brine of an Ice-Sealed Antarctic Lake. In prep.
- Jepsen, S.M., E.E. Adams and J.C. Priscu. Sediment Melt Dynamics in Permanent Antarctic Lake Ice. *Arctic, Antarctic and Alpine Research*. In press.
- Hand, K.P., C. F. Chyba, J. C. Priscu, R. W. Carlson and K. H. Nealson. 2009. Astrobiology and the Potential for Life on Europa. (R. Pappalardo, ed). In press.
- Mikucki, J.A., A. Pearson, D. T. Johnston, A.V. Turchyn, J. Farquhar, D.P. Schrag, A. D. Anbar, J. C. Priscu, P. A. Lee. 2009. A contemporary, microbially-maintained, ferrous subglacial 'ocean'. *Science*, 324:397.
- Priscu, J.C. and C.M. Foreman. 2009. Lakes of Antarctica. p. 555-566 in G.E. Likens (ed.) *Encyclopedia of Inland Waters* volume 2. Oxford: Elsevier Press. 6492 pp.
- Jaraula, C.B., F. Kenig, P.T. Doran, J.C. Priscu and K. A. Welch. 2009. Composition and biodegradation of synthetic oils and hydraulic fluid spilled on the perennial ice cover of Lake Fryxell, Antarctica. *Environmental Science and Technology*, 43: 2708-2713.
- Lanoil, B., M. Skidmore, J. C. Priscu, S. Han, W. Foo, S. W. Vogel, S. Tulaczyk, and H. Engelhardt. 2009. Bacteria beneath the West Antarctic Ice Sheet. *Environmental Microbiology* 11(3), 609–615.
- Jaraula, C.B., F. Kenig, P.T. Doran, J.C. Priscu and K. A. Welch. 2008. SPME-GCMS study of the natural attenuation of aviation diesel spilled on the perennial ice cover of Lake Fryxell, Antarctica. *Science of the Total Environment*. 407:250-262.
- Morgan-Kiss, R., A.G. Ivanov, S. Modla, K. Szymmek, N.P.A. Huner, J.C. Priscu, J.T. Lisle and T.E. Hanson. 2008. Identity and physiology of a new psychrophilic eukaryotic green alga, *Chlorella* cold. Sp. isolated from a transitory pond near Bratina Island, Antarctica. *Extremophiles* DOI 10.1007/s00792-008-0176-4.
- Priscu, J.C., B.C. Christner, J.E. Dore, M.B. Westley, B.N. Popp, K.L. Casciotti, and W.B. Lyons. 2008. Extremely supersaturated N<sub>2</sub>O in a perennially ice-covered Antarctic lake: Molecular and stable isotopic evidence for a biogeochemical relict. *Limnology and Oceanography*, 53: 2439-2450.
- Hodson, A., A.M. Anesio, M. Tranter, A. Fountain, M. Osborn, J. C. Priscu, J. Laybourn-Parry, B. Sattler. 2008. Glacial ecosystems. *Ecological Monographs*, 78(1), 41–67.
- Priscu, J.C., S. Tulaczyk, M. Studinger, M. C. Kennicutt II, B.C. Christner, and C.M. Foreman. 2008. Antarctic Subglacial Water: Origin, Evolution and Ecology. *In*: W. Vincent and J. Laybourn-Parry (eds.), *Polar Lakes and Rivers*. Oxford University Press. Pp. 119-135
- Christner, B.C., M.L. Skidmore, J.C. Priscu, M. Tranter, and C.M. Foreman. Bacteria in subglacial environments. 2008. In R. Margesin, F. Schinner, J.-C. Marx, and C. Gerday (eds.), *Psychrophiles: From Biodiversity to Biotechnology*. Springer, New York. Pp. 51-71.

Sävström, C. J., Lisle, A.M. Anesio, J.C. Priscu and J. Laybourn-Parry. 2008. Bacteriophage in Polar Inland Waters. *Extremophiles*. 12(2):167-175.

Foreman, C.M., B. Sattler, J. A. Mikucki, D. L. Porazinska and J. C. Priscu. 2007. Metabolic Activity and Diversity of Cryoconites in the Taylor Valley, Antarctica. *JGR-Biogeosciences*, 112: Vol. 112, No. G4, G04S32, 10.1029/2006JG000358.

Barrett, J.E., R.A. Virginia, W.B. Lyons, D.M. Mcknight, J.C. Priscu, P.T. Doran, A.G. Fountain, D.H. Wall and D.L. Moorhead. 2007. Biogeochemical stoichiometry of Antarctic dry valley ecosystems. *J. Geophysical Research-Biogeochemistry*. 112, G01010, doi:10.1029/2005JG000141.

The Lake Ellsworth Consortium - A. Behar, M. Bentley, D. Blake, P. Christoffersen, C. Cockell, H. Corr, D.C. Cullen, H. Edwards, A. Ellery, C. Ellis-Evans, G. Griffiths, R. Hindmarsh, D.A. Hodgson, E. King, H. Lamb, L. Lane, K. Makinson, M. Mowlem, J. Parnell, D.A. Pearce, J. C. Priscu, A. Rivera, M.A. Sephton, M.J. Siegert, M.R. Sims, A.M. Smith, M. Tranter, J.L. Wadham, G. Wilson, J. Woodward. 2007. Exploration of Ellsworth Subglacial Lake: a concept paper on the development, organisation and execution of an experiment to explore, measure and sample the environment of a West Antarctic subglacial lake. *Rev. Environ. Sci. Biotechnol.* 6:161–179. doi: 10.1007/s11157-006-9109-9. Also published in *Life in Extreme Environments*, Amils, R., Ellis-Evans, C. and Hinghofer-Szalkay, H.G (eds), Springer, Dordrecht, the Netherlands, 25-44 (2007).

Jepsen, S.M, J.C. Priscu, R. E. Grimm, M.A. Bullock. 2007. The Potential for Lithoautotrophic Life on Mars: Application to Shallow Interfacial-Water Environments. *Astrobiology*, 7:342-354.

Mikucki, J.A. and J.C. Priscu. 2007. Bacterial diversity associated with Blood Falls, A subglacial outflow from the Taylor Glacier, Antarctica. *Applied and Environmental Microbiology* 73: 4029–4039.

Priscu, J.C., B.C. Christner, C.M. Foreman and G. Royston-Bishop. 2007. Biological Material in Ice Cores. *Encyclopedia of Quaternary Sciences*. Volume 2. (Editor in Chief, S.A. Elias). p. 1156-1166. Elsevier B.V., UK.

Lyons, W.B., J. Laybourn-Parry, K. A. Welch and J.C. Priscu. 2006. Antarctic lake systems and climate change. *In: D.M. Bergstrom, P. Convey, A.H.L. Huiskes (Eds.). Trends in Antarctic Terrestrial and Limnetic Ecosystems: Antarctica as a Global Indicator*. Springer, Dordrecht.

Jepsen, S.M., E. E. Adams and J. C. Priscu. 2006. Fuel movement between grain boundaries in ice. *Cold Regions Science and Technology* 45:158–165.

Christner, B.C., G. Royston-Bishop, C. M. Foreman, B. R. Arnold, M. Tranter, K. A. Welch, W. B. Lyons, A. I. Tsapin, and J. C. Priscu. 2006. Limnological Conditions in Subglacial Lake Vostok, Antarctica. *Limnology and Oceanography*. 51: 2485-2501.

Morgan-Kiss, R.M., J.C. Priscu, T. Pockock, L. Gudynaite-Savitch and N. PA Huner. 2006. Adaptation and acclimation of photosynthetic microorganisms to permanently cold environments. *Microbial and Molecular Biology Reviews*. 70: 222–252.

Priscu, J.C. 2005. An Ecosystem of Superlatives. *Bioscience* 55(9): 804-806.

Priscu, J.C., M.C. Kennicutt II, R.E. Bell, S.A. Bulat, J.C. Ellis-Evans, V.V. Lukin, J.-R. Petit, R.D. Powell, M.J. Siegert and I. Tabacco. 2005. Exploring subglacial Antarctic lake environments. EOS, Transactions of the Geophysical Union. Vol. 86, No. 20: 17,193-17,197.

Christner, B.C. and J.C. Priscu. 2005. Subglacial Lake Vostok. Encyclopedia of Water. Wiley Intersciences.

Royston-Bishop G., Priscu J.C., Tranter M., Christner B., Siegert M.J., Lee V. 2005. Incorporation of particulates into accreted ice above subglacial Lake Vostok, Antarctica. Annals of Glaciology 40: 145-150.

Tranter, M. A.G. Fountain, C. H. Fritsen, W.B. Lyons, J.C. Priscu, P.J. Stratham and K.A. Welch. 2005. Perturbation of hydrochemical conditions in natural microcosms entombed within Antarctic ice. Ice and Climate News 6:22-23.

Christner, B.C., J. A. Mikucki, C. M. Foreman, J. Denson and J.C. Priscu. 2005. Glacial ice cores: A model system for developing extraterrestrial decontamination protocols. Icarus 174: 572–584.

Priscu, J.C., C.H. Fritsen, E.E. Adams, H.W. Paerl, J.T. Lisle, J.E. Dore, C.F. Wolf and J. A. Mikucki. 2005. Perennial Antarctic lake ice” A refuge for cyanobacteria in an extreme environment. p. 22-49, In: J.D. Castello and S.O. Rogers (Eds.). Life in Ancient Ice. Princeton Press.

McKay, C.P. D.T. Andersen, W. H. Pollard, J. L. Heldmann, P.T. Doran, C.H. Fritsen, and J. C. Priscu. 2005. Polar Lakes, Streams, and Springs as Analogs for the Hydrological Cycle on Mars. P. 219-233, In Water on Mars and Life (Tetsuya Tokano, Ed). Advances in Astrobiology and Biogeophysics, Springer-Verlag, Berlin, Heidelberg.

Pocock, T., M.-A. Lachance, T. Proschold, J. C. Priscu, S. Kim, and N. P. A. Huner. 2004. Identification of a psychrophilic green alga from Lake Bonney, Antarctica: *Chlamydomonas raudensis* Ettl. (UWO 241) (Chlorophyceae). Journal of Phycology 40 (6): 1138-1148.

Foreman, C.M., C. F. Wolf, and J.C. Priscu. 2004. Impact of episodic warming events on the physical, chemical and biological relationships of lakes in the McMurdo Dry Valleys, Antarctica. Aquatic Geochemistry, 10:239-268.

Mikucki, J.A., C.M. Foreman, J.C. Priscu, W. B. Lyons, B. Sattler, and K. Welch. 2004. Geomicrobiology of Blood Falls: A Saline, Iron-rich Subglacial Feature of Taylor Glacier, Antarctica. Aquatic Geochemistry, 10:199-220.

Roberts, E.C., J.C. Priscu and J. Laybourn-Parry. 2004. Microplankton dynamics in a perennially ice-covered Antarctic lake-Lake Hoare. Freshwater Biology, 49:853-869.

Roberts, E.C., Priscu, J.C., Wolf, C., Lyons, W.B. and Laybourn-Parry, J. 2004. The distribution of microplankton in the McMurdo Dry Valley Lakes, Antarctica: Response to ecosystem legacy or present day climatic controls? Polar Biology, 27, 238-249.

Lee, P.A., J.C. Priscu, G. R. DiTullio, S. F. Riseman, N. Tursich and S. J. De Mora. 2004. Elevated levels of dimethylated-sulfur compounds in Lake Bonney, a poorly ventilated Antarctic lake. Limnology and Oceanography, 49: 1044-1055.

- Lee P.A., J.A. Mikucki, C. M. Foreman, J. C. Priscu, G.R. DiTullio, S. F. Riseman, S. J. de Mora, C. F. Wolf and L. Kester. 2004. Thermodynamic constraints on microbially mediated processes in lakes of the McMurdo Dry Valleys, Antarctica. *Geomicrobiology Journal*, 21:1–17.
- Neumann, K., W. B. Lyons, J. C. Priscu, D. J. Des Marais, K. A. Welch. 2004. The Carbon Isotopic Composition of Dissolved Inorganic Carbon in Perennially Ice-Covered Antarctica Lakes: Searching for a Biogenic Signature. *Annals Glaciol.* 39:518-524.
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- Downes, M.T. and J.C. Priscu. 1995. Profiles of electrode potential and dissolved oxygen in lakes of the McMurdo dry valleys. *Antarctic Journal of the United States* 30:305-307.
- Edwards, R.L. and J.C. Priscu. 1995. Relationships between vertical nutrient flux and phytoplankton biomass and productivity in lakes of the Taylor Valley, Antarctica. *Antarctic Journal of the United States* 30:303-305.
- Priscu, J.C. and P.J. Neale. 1995. Phototactic response of phytoplankton forming discrete layers within the water column of Lake Bonney, Antarctica. *Antarctic Journal of the United States* 30:301-303.
- Takacs, C.D. and J.C. Priscu. 1995. Responses of bacterial growth to inorganic and organic nutrient enrichment in the lakes of the dry valleys, Antarctica. *Antarctic Journal of the United States* 30:303-305.
- Priscu, J.C., B.B. Ward and M.T. Downes. 1993. Water column transformations of nitrogen in Lake Bonney, A perennially ice-covered Antarctic Lake. *Antarctic Journal of the United States, 1993 Review Volume* 28:237-239.
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- Bartlett, R.D. J.C. Priscu and C. D. Woolston. 1993. Influence of high salinity levels on ambient inorganic nitrogen and <sup>15</sup>-nitrogen extraction efficiency in Lake Bonney, Antarctica. *Antarctic Journal of the United States, 1993 Review Volume* 28:245-246.
- Woolston, C.D. and J.C. Priscu. 1993. Phytoplankton utilization of ammonium and nitrate in Lake Bonney: A preliminary assessment. *Antarctic Journal of the United States, 1993 Review Volume* 28:241-243.
- Wing, K.T. and J.C. Priscu. 1993. Microbial communities in the permanent ice cap of Lake Bonney, Antarctica: Relationships among Chlorophyll *a*, gravel and nutrients. *Antarctic Journal of the United States, 1993 Review Volume* 28:246-249.
- Smith, J.J. and J.C. Priscu. 1993. Microbial respiration potential in Lake Bonney using a novel tetrazolium reduction method. *Antarctic Journal of the United States, 1993 Review Volume* 28:244-245.
- Priscu, J.C. 1992. Particulate organic matter decomposition in the water column of Lake Bonney, Taylor Valley, Antarctica. *Antarctic Journal of the United States, 1992 Review Volume* 27:260-262.
- Lizotte, M.L. and J.C. Priscu. 1992. Algal pigments as markers for stratified phytoplankton populations in Lake Bonney (dry valleys). *Antarctic Journal of the United States, 1992 Review Volume* 27:260-262.

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- Sharp, T.R. and J.C. Priscu. 1991. Rates of primary production and growth for phytoplankton in Lake Bonney. *Antarctic Journal of the United States* 26:225-226.
- Lizotte, M.P. and J.C. Priscu. 1991. Natural fluorescence and photosynthetic quantum yields in vertically stable phytoplankton from perennially ice-covered lakes (dry valleys). *Antarctic Journal of the United States* 26:226-228.
- Neale, P.J. and J.C. Priscu. 1991. Variation of the fluorescence quantum yield in relation to photosynthesis by phytoplankton from perennially ice-covered Lake Bonney. *Antarctic Journal of the United States* 26:228-230.
- Priscu, J.C., T.R. Sharp, M.P. Lizotte and P.J. Neale. 1990. Photoadaptation by phytoplankton in permanently ice-covered Antarctic lakes: Response to a non-turbulent environment. *Antarctic Journal of the United States* 25:221-223.
- Lizotte, M.P. and J.C. Priscu. 1990. Photosynthesis-irradiance relationships in phytoplankton from Lake Bonney. *Antarctic Journal of the United States* 25:223-224.
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- Sharp, T.R. and J.C. Priscu. 1990. Ambient nutrient levels and the effects of nutrient enrichment on primary productivity in Lake Bonney. *Antarctic Journal of the United States* 25:226-228.
- Spigel, R.H., I.V. Sheppard and J.C. Priscu. 1990. Temperature and fine structure from Lake Bonney. *Antarctic Journal of the United States* 25:228-229.
- Priscu, J.C., A.C. Palmisano, C.W. Sullivan and L.R. Priscu. 1987. The effect of temperature on inorganic nitrogen and carbon metabolism in Antarctic sea-ice microalgae. *Antarctic Journal of the United States*, 1987 Review Issue.22:196-198.
- Priscu, J.C. 1987. Environmental factors regulating the dynamics of blue-green algal blooms in Canyon Ferry Reservoir, Montana. Final report to the Montana Water Resources Research Institute. 158 p.
- Priscu, J.C., L.R. Priscu, C.W. Sullivan and A.C. Palmisano. 1987. A comparison of neutral lipid content among sea-ice microbial communities in McMurdo Sound, Antarctica. *Antarctic Journal of the United States*, 1987 Review Issue 22:191-193.
- Priscu, J.C. and A. Palmisano. 1986. Contribution of carbon fixed by nitrifying bacteria during ice cover in McMurdo Sound, Antarctica. *Antarctic Journal of the United States*, 1986 Review Issue 21:171-172.
- Priscu, J.C., editor. 2001. Year-Round Access to the McMurdo Region: Opportunities for Science and Education. Special publication 01-10. Department of Land Resources and Environmental Sciences, College of Agriculture, Montana State University, USA, 60 pp.

**MAJOR RESEARCH PROPOSALS OF WHICH I AM/WAS PRINCIPAL OR CO-PRINCIPAL INVESTIGATOR:**

"A Laboratory and Field Study of the Interaction of Microalgae and Bacteria in Aquatic Biofilms", 1985-1986. Funded by NSF Ecology Program. Amount: \$93,000/1 year.

"Response of Aquatic Nitrogen Cycling and Plankton Productivity to Acidification", 1985-1988. Funded by the College of Graduate Studies, Montana State University, Faculty Creativity Program and the U.S. Fish and Wildlife Service. Amount: \$28,500/1 year.

"Factors Regulating Nuisance and Potentially Toxic Blue-Green Algal Blooms in a Through-Flow Ecosystem", 1986. Funded by the Montana State Water Resources Research Center. Amount: \$24,000/1 year.

"Quantitative Estimation of the Effects of Operation of Libby and Hungary Horse Dams on the Reservoirs Fisheries", 1988-1989. Funded by Montana Department of Fish, Wildlife and Parks. Amount: \$137,561/2 years.

"Regulation of Nitrogen Fixation by Organic Matter in Aquatic Ecosystems", 1987-1990. Funded by Procter and Gamble. Amount: \$300,000/4 years.

"Nutrient Dynamics and Attached Algal Growth in a Large River", 1990. Funded by The Soap and Detergent Association, Procter and Gamble and Stone Container Company. Amount: \$80,000/1 year.

"The Effects of Nutrient Enrichment on Benthic Algae and Young-of-the-Year Salmonid Production in the Clark Fork River". 1991. Funded by the Soap and Detergent Association and Stone Container Company. Amount: \$70,000/1 year.

"Photoadaptation by Phytoplankton in Permanently Ice-Covered Antarctic Lakes: Response to a Non-Turbulent Environment", 1989-1992. Funded by NSF Division of Polar Programs. Amount: \$315,000/3 years.

"Persistence, Distribution and Environmental Impact of Enteric Bacteria in Antarctic Seawater", 1990. Funded by NSF Division of Polar Programs. Amount: \$77,000/1 year.

"Impact of Sewage Effluent and Survival of Pathogenic Organisms in McMurdo Sound, Antarctica", 1991-1992. Funded by NSF Division of Polar Programs. Amount: \$212,414/2 years.

"Influence of Phosphorus and Other Environmental Parameters on Toxin Production by the Blue-Green Alga Anabaena flos-aquae", 1991. Funded by the Soap and Detergent Association and Procter and Gamble. Amount: \$38,451/1 year.

"Biogeochemistry of nitrogen in a highly stratified, permanently ice-covered Antarctic Lake". 1992-1995. NSF Division of Polar Programs. Amount: \$340,000/3 years.

"Antarctic Dry Valleys: A Cold Desert Ecosystem", 1993-1999. This is an interdisciplinary project, of which I am a co-principal investigator, (involving 8 scientists) focusing on the effects that global climate change will have on an Antarctic desert ecosystem. NSF LTER Program. Amount: \$4,000,000/6 years. My component: \$450,000/6 years.

"Biogeochemistry of Nitrogen in a Highly Stratified, Permanently Ice-Covered Antarctic Lake". 1992-1995. NSF Division of Polar Programs. Amount: \$340,000/3 years.

NSF Research for Undergraduate Education (RUE) supplemental award to "Biogeochemistry of Nitrogen in a Highly Stratified, Permanently Ice-Covered Antarctic Lake". 1993. Amount: \$5,000/4 months.

"Nuisance Algal Blooms in the Colstrip Surge Pond: Causes and Consequences", 1992-1993. Funded by Montana Power Company. Amount: \$39,204/1 year.

"Antarctic lake ice microbial consortia: Origin, distribution, and growth physiology". 1995-1998. NSF Office of Polar Programs,. Amount: \$550,000/3 years.

NSF Research Education for Undergraduate Education (RUE) supplemental award to "Antarctic Dry Valleys: A Cold Desert Ecosystem", 1993. Amount: \$5,000/4 months.

NSF Research for Undergraduate Education (RUE) supplemental award to "Antarctic Lake Ice Microbial Consortia: Origin, Distribution, and Growth Physiology", 1997. Amount: \$5,000/4 months.

NSF Research for Undergraduate (RUE) supplemental award to "Antarctic Dry Valleys: A Cold Desert Ecosystem", 1997. Amount: \$5,000/4 months.

"Microbial life within the extreme environment posed by permanent Antarctic lake ice". 1998-2000. NSF Life In Extreme Environments Program (LExEn). Amount: \$488,758/3 years.

"The Role of Natural Legacy on Ecosystem Structure and Function in a Polar Desert: The McMurdo Dry Valley LTER Program", 1999-2005. This is an interdisciplinary project, of which I am a co-principal investigator, (involving 8 scientists) focusing on the role of resource legacy on ecosystem properties in an Antarctic desert. NSF LTER Program and the Division of Polar Programs \$4,200,000/6 year. My component: \$519,812/6 years.

"The Biogeochemistry of Dimethylsulfide (DMS) and Related Compounds in a Chemically Stratified Antarctic Lake". 1999-2002. NSF Office of Polar Programs. Amount: \$468,819/3 years.

"The Search for Life in Deep-Ice associated with Lake Vostok, East Antarctic Ice Sheet". 1999-2001. NSF Office of Polar Programs. \$13,000/4 months.

Phytoplankton in the McMurdo LTER lakes. 1999-2001. NSF Office of Polar Programs. \$30,000.

NSF Research for Undergraduate Education (RUE) supplemental award to "Biogeochemistry of DMS and related sulfur compounds in a Chemically Stratified Antarctic Lake", 1999. Amount: \$5,000/4 months.

"Bacterial Dynamics Under Antarctic Lake Ice". 1996-1999. Montana Space Grant Consortium Graduate Student Award. \$52,000/3 years.

"Microbial Nutrition in Icy Systems". 1999-2002. NASA Graduate Student Researchers Program (GSRP). \$66,000/3 years.

"Carbon and sediment cycling between soil and lake ice in the Taylor Valley, Antarctica". 2000-2003. Montana Space Grant Consortium Graduate Student Award. \$17,500/year.

"Mars Immunoassay Life Detection Instrument (MILDI). Volume 1: Investigation and Technical Plan". 2000-2002. NASA Office of Life and Microgravity Sciences and Applications, and Office of Space Flight. Total cost \$298,194/2 years (\$146,000 to MSU).

"Collaborative Research on the Geomicrobiology of Vostok Ice: Implications for Life in Lake Vostok". 2001-2004. NSF LExEn Program. \$760,000/3 years.

"Microbial Diversity and Function in the Permanently Ice-Covered Lakes of the McMurdo Dry Valleys, Antarctica", NSF Microbial Observatories Program. 2003-2008. \$1,200,000.

NSF Research Education for Undergraduate Education (RUE) supplemental award to "Microbial Diversity and Function in the Permanently Ice-Covered Lakes of the McMurdo Dry Valleys, Antarctica", 1993. Amount: \$12,000.

"Life in Polar Regions Lake Ice". 1999-2004. Montana Space Grant Consortium Graduate Student Award. \$52,000/3 years.

“Physical and biological consequences of a hydrocarbon spill on the ice cover of Lake Fryxell, Antarctica”. NSF Office of Polar Programs. \$75,034. 2004-2007.

“The Role of Resource Legacy on Contemporary Linkages Between Biodiversity and Ecosystem Processes in a Cold Desert Ecosystem: The McMurdo Dry Valley LTER Program”. \$7 million/6 years,. 2005-2011. \$619,506/6 years to MSU.

“Nuclear-Magnetic Resonance and Electrical Measurements of Unfrozen Water in Mars-Analog Materials: Implications for Habitability at Subfreezing Temperatures on Mars”. NASA Exobiology Program. 2006-2009. \$99,998 to MSU. Collaboration with R. Grimm, Southwest Research Institute, Boulder, CO.

“Application for cold chambers and associated equipment to complete a subzero science and engineering facility at Montana State University”. NSF-MRI Program. \$1,200,000. 2005-2007.

“Science and Engineering Research Facility for the Study of Subzero Environments”. Murdock Charitable Trust”. \$800,000. 2005-2007.

“Paleo Records of Biotic and Abiotic Particles in Polar Ice Cores”. NSF Office of Polar Programs. \$254,827. 2006-2008.

“IPY-The McMurdo Dry Valley Lakes: Plankton Responses During the Transition to Polar Night”. NSF Office of Polar Programs \$350,000. 2007-2010.

“The presence of hydrocarbon contaminants and biodegradation in lake ice from the McMurdo Dry Valleys”. Pending. NSF-Office of Polar Programs. \$306,655. 2007-2010.

Crary Laboratory (Antarctica) Analytical Services. NSF-OPP. \$450,000 supplement to “The Role of Resource Legacy on Contemporary Linkages Between Biodiversity and Ecosystem Processes in a Cold Desert Ecosystem: The McMurdo Dry Valley LTER Program” .

“Environmentally Non-Disturbing Under-ice Robotic ANtarctic Explorer (ENDURANCE)”. NASA ASTEP Program. \$99,235. 2008-2011.

“Astrobiology of Icy Worlds”. NASA Astrobiology Institute. Total budget: \$8,184,000/5 yrs. MSU component: \$240,975. 2008-2013.

“Collaborative Research: Integrated High Resolution Chemical and Biological Measurements on the Deep WAIS Divide Core”. NSF Office of Polar Programs- Antarctic Glaciology. Total budget: \$2,182,530. MSU Component: \$631,900. 2010-2014.

“Collaborative Research: GeomicroBiology of Antarctic Subglacial Environments (GBASE) Beneath the Mercer and Whillans Ice Streams”. Submitted to NSF Office of Polar Programs- Antarctic Integrated System Science (AISS). Total budget \$10,000,000. MSU component: \$2,540,260. October 2009-October 2014.

**MAJOR ADVISOR TO THE FOLLOWING GRADUATE STUDENTS:**

1. Robert T. Angelo, Ph.D. June 1989. "Hydrogen ion concentration and microbial activity in aquatic alpine systems".

2. Lizhu Wang, Ph.D. 1992. "Control of bacterioplankton activity in a eutrophic lake emphasizing relationships among bacteria, cyanobacteria and nutrients".
3. Thomas Miller, M.S. 1991. "Influence of inorganic and organic nutrient enrichment on blue-green algal activity and relative biomass in a eutrophic southwest Montana reservoir".
4. Thomas Sharp, M.S. 1993. "Temporal and spatial variation of light, nutrients and phytoplankton production in Lake Bonney, Antarctica, Antarctica".
5. Katrin Schwarz, M.S. 1991. "Phytoplankton responses to phytoplankton growth in a large pre-alpine lake: Lake Constance, West Germany".
6. Christopher Woolston, M.S. 1994. "Nitrogen dynamics in Antarctic lakes".
7. Michael Briggs, M.S. 1994. "Chemical and physical factors regulating blue-green algal abundance in a regulated reservoir; Colstrip, Montana".
8. Christina Takacs, Ph.D. 1999. "Bacterial activity and secondary production in Antarctic lakes".
9. Nicole Tursich, M.S. 2002. "The use of Antarctic lake phytoplankton to track global change".
10. Scott Konley, M.S. 2003. "Carbon and sediment cycling between soil and lake ice in the Taylor Valley, Antarctica".
11. Jill A. Mikucki, Ph.D. 2005. "Microbial Ecology of an Antarctic Subglacial environment".
12. Joel Moore, MSc. 2007. "Microbial Processes in the Moats of Lakes in the Taylor Valley, Antarctica."
13. Marie Sabacka, Ph.D. In progress. "Microbial Diversity Across Landscape Units in the McMurdo Dry Valleys, Antarctica".
14. Trista Vick. Bacterial Process in Lakes of the Taylor Valley, Antarctica. In progress.

**SUPERVISOR TO THE FOLLOWING POST-DOCTORAL SCIENTISTS:**

- |                            |                           |
|----------------------------|---------------------------|
| 1. Dr. Robert Murry        | 10. Dr. Emily Roberts     |
| 2. Dr. Walter Dodds        | 11. Dr. Peter Lee         |
| 3. Dr. Michael Lizotte     | 12. Dr. Christine Foreman |
| 4. Dr. N. Kangatharalingam | 13. Dr. Brent Christner   |
| 5. Dr. Kirk Lohman         | 14. Dr. Steve Jepsen      |
| 6. Dr. Robert Spiegel      | 15. Dr. Elanor Bell       |
| 7. Dr. Patrick Neale       | 16. Dr. Jill Thurman      |
| 8. Dr. Diane Brawner       | 17. Sunita Shah           |
| 9. Dr. Christopher Fritsen |                           |

**TECHNICIANS SUPERVISED:**

- |                     |                             |
|---------------------|-----------------------------|
| 1. Mary Ellen Dietz | 6. Patty Denke              |
| 2. Lori Dwyer       | 7. Teresa Tonkovich (Galli) |
| 3. John Beehler     | 8. Linda Loetterle          |
| 4. Kirk Johnson     | 9. Ian Shepard              |
| 5. Thomas Sharp     | 10. Ian Forne               |

11. Richard Bartlett  
12. Rob Edwards  
13. Van Kalbach  
14. Alix Cockcroft  
15. Margaret Giessler  
16. Jordon Grover  
17. Anne Lundberg-Martell  
18. Conrad Cooper  
19. Kate Wing  
20. Jordan Grover  
21. Amanda Grue  
22. Scott Konley

23. Jill Mikucki  
24. Nicole Tursich  
25. Tucker Stevens  
26. Craig Wolf  
27. Amy Chiuchiolo  
28. Nicholas Andrew  
29. Brianna Arnold  
30. Rob VanTreese  
31. Janet Lynch  
32. Andrew Baber  
33. Philip Lee  
34. Erik Bottos

**COURSES TAUGHT:**

1. Molecular and Cellular Biology (Biol 102, freshman level): This course presents a survey of cellular metabolism (plants and animals) and genetics.
2. Algal Ecology-Phycology (Biol 433, senior level): This course is divided into two parts. The first covers taxonomy and evolution of attached and free-living algae, the second is involved with the biochemistry, physiology and ecology of algae. Both marine and freshwater forms are covered.
3. Energetics in Aquatic Systems (Biol 502, graduate level): Covers advanced aspects of heat flow, light penetration, advection and diffusion dynamics of gases and nutrients within a liquid, and gas transfer at the air/water interface. Examines how aquatic microorganisms (bacteria and algae) reciprocate with each other and with their surrounding environment. Particular emphasis is placed on physiological adaptations by the organisms to changing environmental conditions. The course stresses how these processes relate to the biological component of marine and freshwater systems.
4. Physical-Chemical Limnology (graduate level): Focuses on the interaction of optics, mixing/diffusion and lake chemistry. Both marine and freshwater systems are discussed.
5. Advanced Biological Limnology (graduate level): Covers physiological responses of microplankton to the physical and chemical environment. The approach is examine the role of microorganisms to ecosystem structure and function.