

## JAMES PAUL HOFFMANN

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### EDUCATION

Ph.D., 1981, University of Wisconsin, Madison  
Major – Botany, Minor - Statistics/Water Chemistry  
Advisor - Dr. Linda E. Graham  
Thesis title: The role of vitamins in the growth and ecology  
of *Cladophora glomerata* (Chlorophyta).

B.Sc., 1969, Cornell University, Ithaca, New York  
Major – Biology (Marine), Minor - Chemistry

**Honors:** NYU Faculty Resource Network University Associate – Summer 2004  
IBM Invention Achievement Award for US Patent# 6,314,390 B1, 2001  
Nominated for Carrigan Undergraduate Teaching Award, 1994  
Davis Graduate Fellowship, 1975  
New York State Regents Scholarship, 1965

### PROFESSIONAL AFFILIATIONS

International Society of Genetic and Evolutionary Computation (2001- present)  
American Society of Limnology and Oceanography (1984 – 2000)  
North American Benthological Society (1988 – 2000)  
Phycological Society of America (1984 – 2000)

### PROFESSIONAL EXPERIENCE

University of Vermont, Burlington, Vermont

#### **College of Agriculture and Life Sciences**

Department of Plant Biology (Primary Appointment)

Lecturer and Research Assistant Professor - 1983 -1990

Assistant Professor - 1990 - 1996

Associate Professor - 1996 to present. Teach courses on aquatic botany, and plant ecology. Conduct research on the ecology of algae, and the development of simulation models of aquatic ecosystems. Supervise M.S. and Ph.D. candidates.

Sabbatical Leave – 1998: *IBM Advanced Technology Division*, Essex Junction, VT. Developed evolutionary algorithms for optimizing simulation models. *Université d’Auvergne* and *Université Blaise Pascal*, Clermont-Ferrand, France: learned object-oriented programming for ecosystem simulation models incorporating 3D visualization.

Director – 2002 to 2005. Administered new CALS Integrated Biological Science program.

#### **College of Engineering and Mathematical Sciences**

Department of Computer Science (Secondary Appointment)

Associate Professor – 2002 to present. Conduct research on evolutionary computation applied to modeling complex biological systems. Teach course on Evolutionary Computation.

**University of Wisconsin**, Madison, Wisconsin

Department of Plant Pathology, 1981-1983

Postdoctoral Research Associate - directed a research team investigating the effect of temperature, light and nutrient stress in the susceptibility of the nuisance aquatic macrophyte, *Myriophyllum spicatum* to disease.

Institute for Environmental Studies, Summer 1980

Lecturer - conducted a graduate workshop on lake management techniques.

Department of Botany, 1974-1979

Teaching Assistant - taught laboratory and discussion sections on general botany and phycology; received rating of excellent on 91% of student evaluations.

Research Assistant - wrote grant and secured funding from the Department of Interior for a study of the role of vitamins and epiphytic bacteria in the nutritional ecology of *Cladophora*.

Department of Bacteriology, 1972-1974

Laboratory Assistant - conducted radioisotope studies on thermophilic bacteria, lichen photosynthesis as a function of water potential, and the effect of power plant thermal effluent on algal community photosynthesis.

**Institute for Health Planning**, Madison, Wisconsin, 1981

Computer Programmer - wrote data base management programs in FORTRAN and BASIC on a UNIVAC 1180.

**University of Michigan**, Ann Arbor, Michigan

College of Engineering, 1979-1980

Consultant - designed and directed a controlled-environment photosynthesis study of the nuisance alga *Cladophora* as a function of temperature and light. This project was part of an E.P.A. study entitled, "Ecological Studies and Mathematical Modeling for the Control of *Cladophora* in the Great Lakes."

Employed at several oceanographic institutions, 1967-1972

Research Technician - conducted research on macro and micro algal ecology and physiology. Duties included operation of small boats; SCUBA diving; water sampling; oceanographic cruises; chemical analyses, algal culturing and data analysis.

**RESEARCH INTERESTS**

[Modeling complex biotic systems with evolutionary computation](#); aquatic ecosystems; physiological ecology of algae, especially photosynthesis and production as affected by the interactions among physicochemical factors; competition theory; production and use of algal biomass.

## FUNDING HISTORY

### Current

1. Title: Investigating the Advantages of Gene Expression Programming over Genetic Programming for Evolving Novel Models of Biological Systems. [J. Hoffmann (PI), S. Levine, T. Perkins]  
Source: Department of Energy EPSCoR  
Amount: \$40,000  
Period: 2005-2007
2. Title: Using Genetic Programming to Evolve Optimally Specified Process Models of Biological Systems. [J. Hoffmann (PI), D. Benti]  
Source: U.S. Department of Agriculture-Hatch  
Amount: \$35,000  
Period: 2003-2007

### Completed

3. Title: Developing Cross-Disciplinary Learning Experiences in Evolutionary Computation  
Source: Center for Teaching and Learning – University of Vermont  
Amount: \$5,000  
Period: 2004 - 2005
4. Title: A Novel Approach for Developing and Evaluating PDE Models of the Spatial Spread of Invasive Species. [J. Hoffmann (PI), D. Benti]  
Source: Department of Energy EPSCoR and U.S. Department of Agriculture-Hatch  
Amount: \$65,000  
Period: 2000-2003
5. Title: The Role of Natural versus Anthropogenic Factors in Assessing Ecological Risks in Agricultural Watersheds. [M. Watzin (PI), J. Hoffmann, N. Gotelli, A. McIntosh]  
Source: Environmental Protection Agency EPSCoR  
Amount: \$268,633  
Period: 2000-2002
6. Title: [Optimization of an Algal System for Small-Scale Tertiary Wastewater Treatment.](#)  
[J. Hoffmann (PI)]  
Source: U.S. Department of Agriculture-Hatch  
Amount: \$54,438  
Period: 1995-2000
7. Title: Understanding Phosphorus Cycling, Transport and Storage in Stream Ecosystems as a Basis for Phosphorus Management.  
[J. Hoffmann (PI), E. Cassell, J. Drake, S. Levine, D. Meals, D. Wang]  
Source: U.S. Environmental Protection Agency  
Amount: \$190,000  
Period: 1993-1996

8. Title: Evaluation of a Modified Algal Turf Scrubber for Small-Scale Tertiary Treatment of Wastewater. [J. Hoffmann (PI), K. Squires]  
Source: U.S. Geological Survey via Vermont Water Resources Research Center.  
Amount: \$128,870 [includes match]  
Period: 1993-1996
9. Title: Acquisition of an Inductively Coupled Plasma Atomic Emission Spectrometer.  
[D. Ross (PI), P. Kindstedt, T. Scherbatskoy, W. Harper, W. Jokela, D. DeHayes, J. Hughes, J. Hoffmann]  
Source: U.S. Department of Agriculture – NRICGP  
Amount: \$49,975  
Period: 1996
10. Title: Disturbance Effects on the Autecology of Early and Late Successional Stream Diatoms.  
[J. Hoffmann (PI)]  
Source: UVM Institutional Research Grant  
Amount: \$3,162  
Period: 1993
11. Title: Water Quality Restoration of Dairy-Products Wastewater by Attached Algae.  
[J. Hoffmann (PI)]  
Source: U.S. Department of Agriculture-Hatch  
Amount: \$7,500  
Period: 1992-1995
12. Title: The Influence of Hydrodynamics on the Growth of Attached Algae. [J. Hoffmann(PI)]  
Source: Ecological Systems Inc., Bethesda, Maryland  
Amount: \$2,700  
Period: 1992-1994
13. Title: Microscope Image Analysis Equipment and Software. [P. Lintilhac (PI), P. Hannah, T. Perkins, T. Otter, R. Ullrich, J. Hoffmann, D. Barrington]  
Source: UVM RAC  
Amount: \$14,395  
Period: 1992
14. Title: The Interaction of Light Intensity and Flowing Water on the Growth of a Phosphorus-Limited Alga. [J. Hoffmann (PI), P. Cook]  
Source: U.S. Geological Survey via Vermont Water Resources Research Center.  
Amount: \$107,569 [includes match]  
Period: 1988-1990
15. Title: A Preliminary Investigation of the Population Dynamics of a Unicellular Periphytic Alga.  
[J. Hoffmann (PI), P. Cook]  
Source: UVM Institutional Research Grant  
Amount: \$3,330  
Period: 1987-1989

16. Title: The Interaction of Phosphorus Concentration and Flowing Water on the Growth of Stream Algae. [J. Hoffmann (PI), P. Cook]  
Source: U.S. Geological Survey via Vermont Water Resources Research Center  
Amount: \$37,483 [includes match]  
Period: 1987-1988
17. Title: Feasibility of Tertiary Wastewater Treatment by Attached Microbes (Periphyton) in Cold Regions. [J. Hoffmann (PI), J. Morris, P. Cook]  
Source: U.S. Dept. of Interior via Vermont Water Resources Research Center  
Amount: \$76,148 [includes match]  
Period: 1984-1986
18. Title: Feasibility of Tertiary Wastewater Treatment by Attached Microbes (Periphyton) in Cold Regions. [J. Hoffmann (PI), J. Morris, P. Cook]  
Source: UVM Institutional Research Grant  
Amount: \$3,500  
Period: 1984-1985
19. Title: Development of a Biology 1 Slide File for Laboratory Instruction. [J. Hoffmann]  
Source: UVM Instructional Development Center  
Amount: \$1,800  
Period: 1984-1985
20. Title: The Role of Vitamins and Epiphytic Bacteria in the Nutritional Ecology of *Cladophora*. [G. Gerloff (PI), J. Hoffmann]  
Source: U.S. Dept. of Interior via Wisconsin Water Resources Research Center.  
Amount: \$20,000  
Period: 1977-1979

## PUBLICATIONS

### PEER REVIEWED

- Bentil, D.E., Ellingwood, C.D., Osei, M.B. and **Hoffmann, J.P.** 2007. Analysis of a Schnute Postulate-based Unified Growth Model for Model Selection in Evolutionary Computation. BioSystems 89: (In Press).
- Hoffmann, J.P.** 2006. Simultaneous Inductive and Deductive Modeling of Ecological Systems via Evolutionary Computation and Information Theory. Transactions of the Society for Modeling and Simulation International – Special Issue on Ecological and Environmental Simulation. Simulation 82 (7): 439-450.
- Hoffmann, J.P.** 2005. Darwin and Computational Ecology: How Simple Computational Models of Evolution Help our Search for Better Models of Ecological Systems. Keynote Address: In Proceedings of Open International Conference on Modeling and Simulation - OICMS 2005, Hill, D. R. C., V. Barra., and M. K. Troer (Eds.), Blaise Pascal University, France, pp 27-39.
- Eppstein, M.J. and **Hoffmann, J.P.** 2005. Crystallographic Case Study in an Interdisciplinary Evolutionary Computation Course. In *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO-2005)* – Special Session on Evolutionary Computation in Practice, Washington, D.C., 2005.
- Osei, B. M., **Hoffmann, J. P.**, Ellingwood, C. D., and Bentil, D.E. 2005. Probabilistic Uncertainty in Population Dynamics. WSEAS Transactions on Biology and Medicine 1(2):51-56.

- Hoffmann, J.P.**, Ellingwood, C.D., Bonsu, O.M. and Benteil, D.E. 2004. Ecological model selection via evolutionary computation and information theory. Invited paper for special issue on biological applications of evolutionary computation. Journal of Genetic Programming and Evolvable Machines 5(2): 229-241.
- Benteil, D. E., Bonsu O. M., Ellingwood, C. D., **Hoffmann, J. P.** 2003. Deterministic uncertainty in population growth. 4th IEEE International Symposium on Uncertainty Modeling and Analysis (ISUMA). IEEE Computer Society Press, Los Alamitos, CA. pp 274 - 278
- Hoffmann, J.P.**, Ellingwood, C.D., Bonsu, O.M. and Benteil, D.E. 2002. Turning genes off and on: Using genetic algorithms with complexity-based fitness for model selection in ecology. . Proceedings of the Genetic and Evolutionary Computation Conference (GECCO-2002) – Workshop Special Session on Biological Applications of Evolutionary Computation, pp 38-40.
- Gustina, G.W. and **Hoffmann, J.P.** 2000. Periphyton dynamics in a mountain stream during winter. Artic, Antarctic and Alpine Research. 32(2): 127-134.
- Wang, D., Levine, S., Meals, D.W., **Hoffmann, J.P.**, Drake, J.C. and Cassell, E.A. 1999. Importance of in-stream nutrient storage to P export from a rural, eutrophic river in Vermont, U.S.A. In T. Manley [Ed.] *Lake Champlain in Transition: From Research Toward Restoration*. American Geophysical Union. Water Science and Application 1:205-223.
- Meals, D.W., **Hoffmann, J.P.**, Levine, S.N., Cassell, E.A., Wang, D., Drake, J.C., Pelton, D.K., Galarneau, H.M. and Brown, A.B. 1999. Retention of spike additions of soluble phosphorus in a northern eutrophic stream. J. N. Am. Benthol. Soc. 18:185-198.
- Watts, J., Bittner, C., Heaberlin, D. and **J. Hoffmann**. 1999. Extraction of compact model parameters for ULSI MOSFETs using a genetic algorithm. Modeling and Simulation of Microsystems, Technical Proceedings of the Second International Conference, San Juan, Puerto Rico, pp 176-179.
- Hoffmann, J. P.** 1998. Wastewater treatment with suspended and non-suspended algae - a review. J. Phycol. 34(5): 757-763.
- Cassell, E.A., Dorioz, J.M., Kort, R.L., **Hoffmann, J.P.** Meals, D.W., Kirschtel, D. and Braun, D.C. 1998. Watershed Modeling: Dynamics of phosphorus storage, cycling, transport and export. J. Environ. Qual. 27:293-298.
- Borchardt, M.A., **Hoffmann, J.P.** and Cook, P.W. 1994. Phosphorus uptake kinetics of *Spirogyra fluviatilis* (Charophyceae) in flowing water. J. Phycol. 30 (3): 403-417
- Hoffmann, J.P.** 1993. Investigating hydrodynamic effects on diatoms at small temporal and spatial scales. In G. A. Lamberti and A. D. Steinman [Eds.] *Research in Artificial Streams: Applications, Uses and Abuses*. J. N. Am. Benthol. Soc. 12(4): 356-359.
- Hoffmann, J.P.** 1990. Dependence of photosynthesis and vitamin B<sub>12</sub> uptake on cellular vitamin B<sub>12</sub> concentration in the multicellular alga *Cladophora glomerata* (Chlorophyta). Limnol. Oceanogr. 35(1):100-108.
- Davis, L.S., **Hoffmann, J.P.** and Cook, P.W. 1990. Seasonal succession of algal periphyton from a wastewater treatment facility. J. Phycol. 26(4): 610-617.
- Davis, L.S., **Hoffmann, J.P.** and Cook, P.W. 1990. Production and nutrient accumulation by periphyton in a wastewater treatment facility. J. Phycol. 26(4): 617-623.

- Morris, J.W., Stuart, L.S., **Hoffmann, J.P.** and Cook, P.W. 1988. Potential for tertiary nitrogen removal by a periphytic algal system. In Liptak, S.C., Atwater, J.W. and Mavinic, D.S. [Eds.] *Environmental Engineering: Proceedings of the 1988 Joint CSCE-ASCE National Conference*. Canadian Society for Civil Engineering in conjunction with Environment Canada and the University of British Columbia, Vancouver, B.C. pp. 270-273.
- Colman, J.A., Sorsa, K., **Hoffmann, J.P.**, Smith, C.S. and Andrews, J.H. 1987. Yield-and photosynthesis-derived critical concentrations of tissue phosphorus and their significance for growth of Eurasian Water Milfoil, *Myriophyllum spicatum* L. Aq. Bot. 29:111-122.
- Hoffmann, J.P.**, Colman, J.A., Kutchera, K.M., Nordheim, E.V. and Andrews, J.H. 1984. A laboratory culture system for pathological and physiological studies of rooted aquatic plants. Can. J. Bot. 62:2290-2296.
- Hoffmann, J.P.** and Graham, L.E. 1984. Effects of selected physicochemical factors on growth and zoosporogenesis of *Cladophora glomerata* (Chlorophyta). J. Phycol. 20:1-7.
- Graham, J.M., Auer, M.T., Canale, R.P. and **Hoffmann, J.P.** 1982. Ecological studies and mathematical modeling of *Cladophora* in Lake Huron: 4. Photosynthesis and respiration as functions of light and temperature. Internat. Great Lakes Res. 8:100-111.
- Brock, T.D. and **Hoffmann, J.P.** 1974. Temperature optimum of algae living in the outfall of a power plant on Lake Monona. Wis. Acad. Sci. Arts Letts. 62:195-203.

## **BOOK REVIEWS**

- Klein, R.M. and **Hoffmann, J.P.** 1987. Book review of a Biology of the Algae by Philip Sze, Quarterly Review of Biology 62(1):91-92.
- Hoffmann, J.P.** 1986. Book review of Systematics of the Green Algae, D.E.G. Irvine and John, D.M. (Eds.). Quarterly Review of Biology 61(2):274.

## **MISCELLANEOUS PUBLICATIONS**

- Hoffmann, J. P.**, J. Watts, C. Bittner and d. Heaberlin. 1999. Experiments with a Genetic Algorithm for Fitting a 6sf MOSFET Model. Project Summary Report, IBM Microelectronics, 47 pp.
- Hoffmann, J.P.**, E.A. Cassell, J.C. Drake, S. Levine, D.W. Meals and D. Wang. 1996. Understanding Phosphorus Cycling, Transport and Storage in Stream Ecosystems as a Basis for Phosphorus Management. U.S. EPA Technical Report No. 20. 285 pp.
- Hoffmann, J.P.** 1995. Treating wastewater with attached algae: a research facility to optimize performance. Alternative Wastewater Treatment: Conference Proceedings. Lake Champlain Basin Program, Education Report No. 4, pp. 70-72.
- Hoffmann, J.P.** and Vigoreaux, J. (Eds.) 1993. Introductory biology lab manual. Kendall/Hunt Publishers, Dubuque, Iowa, 87 pp.

Cook, P.W., **Hoffmann, J.P.**, Morris, J.W. and Stuart, L.S. 1986. Feasibility of tertiary wastewater treatment by attached microbes (periphyton) in cold regions. Vermont Water Resources Center Technical Report 84-06, 36pp.

**Hoffmann, J.P.** and Gerloff, G.C. 1980. The significance of vitamins and the epiphytic bacterial community in the nutritional ecology of *Cladophora glomerata*. Wisconsin Water Resources Center Technical Report 80-07, 24pp.

### **PUBLISHED ABSTRACTS**

Osei, B. M., **Hoffmann, J. P.** Ellingwood, C. D., and Bentil, D.E. 2005. Probabilistic Uncertainty in Population Dynamics. WSEAS Multiconference at Udine, Italy, January, 2005.

Bonsu, O., Bentil, D., **Hoffmann, J.P.**, and Ellingwood, C. Modeling Invasive Species Dynamics. Mathematical Association of America and Young Mathematicians Network, Phoenix, AZ, January, 2004.

**Hoffmann, J.P.**, Ellingwood, C.D., Bonsu, O.M. and Bentil, D.E. Turning genes off and on: Using genetic algorithms with complexity-based fitness for model selection in ecology. Genetic and Evolutionary Computation Conference (GECCO-2002), New York City, July, 2002.

Swisher, B.J., Watzin, M.C., Gotelli, N.J., **Hoffmann, J.P.** Alexander, G.G., and D.M. Varney. Land Use and Stream Architecture: Predicting Macroinvertebrate Community Composition below Stream Confluences. 52nd Annual Meeting, North American Benthological Society, Pittsburg, Pennsylvania, May, 2002.

Osei, B., **Hoffmann, J.P.**, Bentil, D. and Ellingwood, C. Using an Evolutionary Algorithm for Model Selection and Optimization. International Workshop on Protein Folding. Center for Theoretical Physics, Trieste, Italy, June, 2001.

**Hoffmann, J.P.**, Bentil, D., Osei, B. and Ellingwood, C. Using an Evolutionary Algorithm for Model Selection and Optimization. NSF and DOE EPSCoR Workshop, Brookhaven National Lab, Brookhaven, NY, May, 2001

Watts, J., Bittner, C., Heaberlin, D. and **Hoffmann, J.P.** Extraction of compact-model parameters for ULSI MOSFETs using a genetic algorithm. Second International Conference on Modeling and Simulation of Microsystems, Semiconductors, Sensors and Actuators, San Juan, Puerto Rico, April, 1999

**Hoffmann, J.P.** and Cassell, E.A. Modeling phosphorus cycling, transport and storage in stream ecosystems typical of the Lake Champlain Basin. Lake Champlain Research Conference, Burlington, VT, May, 1998.

Wang, D., Cassell, E.A., Drake, J.C., **Hoffmann, J.P.**, Levine, S., Meals, D.W., Brown, A., Gustina, G., Pelton, D. and Shabunia, H. Phosphorus cycling, transport, and storage in the LaPlatte River, Vermont. Lake Champlain Research Conference, Burlington, VT, May, 1998.

Meals, D.W., **Hoffmann, J.P.**, Levine, S., Cassell, E.A., Wang, D., Drake, J.C., Pelton, D., Galarneau, H. and Brown, A. Retention of spike additions of soluble phosphorus in the LaPlatte River, Vermont. Lake Champlain Research Conference, Burlington, VT, May, 1998.

Kirschtel, D.B., and **Hoffmann, J.P.** Eco-hydrodynamics of diatom immigration: interaction between Reynolds number and density of microscale roughness elements. 46th Annual Meeting, North American Benthological Society, Prince Edward Island, Canada, June, 1998.

- Kirschtel, D.B., **Hoffmann, J.P.**, and Squires, K.D. Eco-hydrodynamics of diatom immigration: the effects of microscale roughness in turbulent flow. 45th Annual Meeting, North American Benthological Society, San Marcos, Texas, May, 1997.
- Cassell, E.A., Dorioz, J.M., Kort, R.L., **Hoffmann, J.P.** Meals, D.W. Watershed Modeling: Dynamics of phosphorus storage, cycling, transport and export. Special Symposium on Agricultural Phosphorus and Eutrophication at the annual meeting of the American Society of Agronomy, Indianapolis, Indiana, November, 1996
- Kirschtel, D.B. and **Hoffmann, J.P.** *Au Revoir M. Verhulst*: Alternatives to the logistic function for modeling the growth of algal biofilms. 44th Annual Meeting, North American Benthological Society, Kalispell, Montana, June 1996.
- Wang, D., Cassell, E.A., Drake, J.C., **Hoffmann, J.P.**, Levine, S., Meals, D.W., Braun, D.C., Brown, A., Pelton, D., Shabunia, H. and Windhausen, L. Influences on phosphorus output from a rural river in the Lake Champlain Basin. 81st Annual Meeting, Ecological Society of America, Providence, Rhode Island, August 1996.
- Hoffmann, J.P.**, Gustina, G.W. and McKenny, H.C. Dynamics of periphyton-phosphorus interactions in a eutrophic river in northern Vermont. 43rd Annual Meeting, North American Benthological Society, Keystone, Colorado May 1995.
- Gustina, G.W. and **Hoffmann, J.P.** Periphyton dynamics in montane streams during winter. 43rd Annual Meeting, North American Benthological Society, Keystone, Colorado May 1995.
- Kirschtel, D.B., **Hoffmann, J.P.** and Squires, K.D. Ecohydrodynamics of diatom immigration: the effects of microscale roughness elements in low Reynolds number flow. 43rd Annual Meeting, North American Benthological Society, Keystone, Colorado May 1995.
- McKenny, H.C. and **Hoffmann, J.P.** Analysis of diatom communities along a river pollution gradient: their effectiveness as a biological water quality index. 43rd Annual Meeting, North American Benthological Society, Keystone, Colorado May 1995.
- Hoffmann, J.P.** and St. John, M. 1993. Hydrodynamic influence of current velocity interacting with substrate roughness on periphyton production in experimental wastewater treatment streams. 41st Annual Meeting, North American Benthological Society, University of Calgary, Calgary, CANADA May 1993.
- Hoffmann, J.P.** A small-scale closed-channel laboratory stream for quantifying stream diatom demographics. Special session on Design and Use of Artificial Streams. 40th Annual Meeting, North American Benthological Society, Louisville, KY. May 1992.
- Hoffmann, J.P.** and Cook, P.W. A closed-channel laboratory stream for investigating the population dynamics of stream diatoms. Fourth International Phycological Congress. Duke University, Durham, N.C. August 1991.
- Borchardt, M.A., **Hoffmann, J.P.** and Cook, P.W. Phosphorus uptake kinetics of *Spirogyra fluviatilis* in flowing water. 38th annual meeting, North American Benthological Society, Blacksburg, VA, May 1990.
- Hoffmann, J.P.** Preliminary results with a closed-channel laboratory stream for studying the population biology of diatoms. 3rd Annual Algal Ecology Consortium, Erlanger, KY, April 1990.

- Borchardt, M.A., **Hoffmann, J.P.** and Cook, P.W. Phosphorus uptake and growth kinetics of a lotic species of *Spirogyra* as a function of low flow rates. Poster, 37th annual meeting, North American Benthological Society, Guelph, Ontario, Canada, May 1989.
- Morris, J.W., Stuart, L.S., **Hoffmann, J.P.** and Cook, P.W. Potential for tertiary nitrogen removal by a periphytic algal system (PAS). Joint ASCE-CSCE National Conference on Environmental Engineering, Vancouver, British Columbia, Canada, July 1988.
- Hoffmann, J.P.**, Cook, P.W., Morris, J.W. and Stuart, L.S. Feasibility of tertiary wastewater treatment by a periphytic algal community during winter. Phycological Society of America, Columbus, Ohio, August 1987.
- Hoffmann, J.P.**, Gordon, L.S., and Cook, P.W. Floristic study of attached algae at a Vermont wastewater treatment plant. Phycological Society of America, Columbus, Ohio, August 1987.
- Hoffmann, J.P.**, Gordon, L.S., and Cook, P.W. Algal growth and productivity at a Vermont wastewater treatment plant. Phycological Society of America, Columbus, Ohio, August 1987.
- Colman, J.A., Sorsa, K., Santha, C.R., **Hoffmann, J.P.**, Smith, C.S. and Andrews, J.H. The significance for growth rate of yield and photosynthesis derived critical tissue nutrient concentrations for Eurasian Water Milfoil, *Myriophyllum spicatum* L. and the blue-green alga *Microcystis aeruginosa* Kutz. American Society of Limnology and Oceanography, Madison, Wisconsin, June 1987.
- Gordon, L.S., **Hoffmann, J.P.** and Cook, P.W. A qualitative and quantitative study of an algal community in a secondary clarifier tank. Poster, 25th Northeast Algal Symposium, Woods Hole, Massachusetts, April 1986.
- Hoffmann, J.P.** The relative influence of vitamin B<sub>12</sub> and phosphorus on growth and photosynthesis of *Cladophora glomerata* (Chlorophyta) in nature. 23rd Northeast Algal Symposium, Woods Hole, Massachusetts, April 1984.
- Hoffmann, J.P.** Dependence of light-saturated photosynthesis and growth of *Cladophora glomerata* (L.) Kutz. on intracellular vitamin B<sub>12</sub> concentration. Phycological Society of America, Grand Forks, North Dakota, August 1983.
- Hoffmann, J.P.**, Kutchera, K.M., Colman, J.A., and Andrews, J.H. A culture system for pathological studies of submerged aquatic plants. Poster, The American Phytopathological Society, Des Moines, Iowa, July 1983.
- Hoffmann, J.P.**, Kutchera, K.M., Colman, J.A., and Andrews, J.H. Design and preliminary evaluation of a culture system for plant pathological studies of *Myriophyllum spicatum*. American Water Resources Association, Milwaukee, Wisconsin, March 1983.
- Graham, J.M., Auer, M.T., Canale, R.P. and **Hoffmann, J.P.** Ecological studies and mathematical modeling of *Cladophora* in Lake Huron: 4. Photosynthesis and respiration as functions of light and temperature. Environmental Protection Agency symposium on filamentous algae of the Great Lakes, Hickory Corners, Michigan, October 1981.
- Auer, M.T., Graham, J.M., Canale, R.P. and **Hoffmann, J.P.** Spatial and temporal distribution of *Cladophora glomerata* as regulated by light, temperature and internal phosphorus pool size. American Society of Limnology and Oceanography. Milwaukee, Wisconsin, June, 1981.

Auer, M.T., Graham, J.M. and **Hoffmann, J.P.** Physical and chemical factors affecting the distribution of two species of attached algae in the Laurentian Great Lakes. Lake Superior Biological Conference. Duluth, Minnesota, April 1980.

Auer, M.T., Canale, R.P., Graham, J.M. and **Hoffmann, J.P.** Photosynthetic requirements of *Cladophora glomerata* as related to distribution patterns in the Great Lakes. International Association for Great Lakes Research, Kingston, Ontario, May 1980.

**Hoffmann, J.P.** Photoperiodic control of reproduction in the nuisance alga *Cladophora glomerata* (L.) Kutz (Chlorophyceae, Cladophorales). Phycological Society of America, Stillwater, Oklahoma, August 1979.

### **INVITED SEMINARS**

Darwin and Computational Ecology: How Simple Computational Models of Evolution Help our Search for Better Models of Ecological Systems. Invited Keynote address at the Open International Conference on Modeling & Simulation, June 12<sup>th</sup> – 15<sup>th</sup> 2005 – ISIMA / Blaise Pascal University – France

Evolutionary Computation and Model Selection. UVM Computer Science Seminar Series, January 2002.

Evolutionary Computation. IBM Workshop. Essex Junction, VT, May 2001, May 2002.

Deterministic Compartment Models in Ecology. Cemagref, Clermont-Ferrand, France, September 1998.

Periphyton-Phosphorus Interactions In A Cold-Region Eutrophic River. Geology Seminar Series on Lake Champlain and its Basin. University of Vermont. March 1996.

Using Periphyton For Applied And Basic Research. Current Topics in Biology lecture series. Johnson State College, Johnson, VT. March 1995.

Treating Wastewater With Attached Algae: A Research Facility To Optimize Performance. Alternative Waste Water Treatment Conference. Lake Champlain Basin Program and E.P.A., Burlington, VT. October 1994.

Algal Periphyton: A Model System For Investigating Ecological Succession. North Carolina State University, Raleigh, NC. October 1992.

Ecology of Attached Algae of Streams. Sigma Xi annual banquet. Trinity College, Burlington, VT. April 1991.

Research on The Ecology of Stream Algae at The University of Vermont. New England Association of Environmental Biologists. Fifteenth Annual Meeting, Fairlee, VT. March 1991.

Botany and Medical History. Beaumont Medical History Club. University of Vermont Medical Alumni Association, Burlington, VT. October 1990.

Structure and Dynamics of Algal Periphyton In Lotic, Hypertrophic Systems. Environmental Science Seminar. Johnson State College, Johnson, VT. February 1989.

Structure and Dynamics of Periphyton in a Lotic, Hypertrophic System. Fourth Annual Periphyton Conference, University of Louisville, Louisville, KY, March 1988.

Perspectives on Aquatic Plant Pathology. Ecology Seminar Program. Johnson State College, Johnson, VT. February 1987.

## TEACHING EXPERIENCE

### COURSES

BIOLOGY 1,2 **Principles of Biology**. (Fall: 550 students, Spring: 400 students).

Lecture, lab - 4 credits.

Course coordinator for teaching staff of 20 with 24 laboratories per week (1983 to 1991).

BIOLOGY 2 **Principles of Biology**. (Spring 1986 to 1994: 400 students).

Lecture, lab - 4 credits

Present lectures on chemistry, enzymes, thermodynamics, origin of life, cytology, membranes, respiration and photosynthesis.

BCOR 102 **Ecology and Evolution**. (Spring 2007: 48 students).

Lecture, lab - 4 credits

Core course on ecology and evolution required of life-science majors.

BOTANY 6 **The Green World**.

(Spring 1984, 1985, Fall 1986, 1988, 1990-1994, 2000-2005, 2007: 250 to 300 students).

Lecture - 3 credits Course on ethnobotany for non-science majors.

BOTANY 160 **Plant Ecology**. (Fall 1985, 1987, 1989, 1991-1997, 1999, 2002: 20 students).

Lecture, lab - 4 credits Course on plant ecology for biology majors.

BOTANY 197, 198 **Undergraduate Independent Research**.

(1988-1990, 1994-1995, 1996-1997, 2004: 21 students).

Supervised student research projects for variable credit hours.

BOTANY 213 **Plant Communities**. (Spring 1992: 12 students)

Lecture, lab - 3 credits

Course on plant community ecology for upper-level undergraduates and graduate students.

BOTANY 234 **Freshwater Algal Ecology**. (Spring 1996, 1999: 8 students)

Lecture, lab - 3 credits

Course on algal ecology for upper-level undergraduates and graduate students.

BOTANY 295 Special Topics – **Evolutionary Computation**. (Fall 2000: 15 participants).

Graduate colloquium - 1 credit

BOTANY 295 Special Topics – **Evolutionary Computation**. (Fall 2004: 16 students).

Lecture, lab - 3 credits

Course on evolutionary algorithms for advanced undergraduates and graduate students.

Cross-listed with Computer Science.

BOTANY 295 - Special Topics - **Aquatic Plants of the Lake Champlain Basin**.

(Summer 1992-1997, 1999, 2007: 15 students).

Lecture, lab and field - 3 credits.

Field course on the ecology of aquatic plants and algae of lakes and streams in the Champlain Valley.

BOTANY 295. Special Topics - **Phosphorus Dynamics in Rivers**. (Spring 1994: 4 students). Graduate colloquium - 1 credit

BOTANY 295. Special Topics - **Theoretical Plant Ecology**. (Fall 1989: 5 students). Graduate colloquium - 1 credit.

BOTANY 295. Special Topics - **Ecological Models**. (Spring 1995: 5 students). Graduate colloquium - 1 credit

BOTANY 295- Special Topics - **Plant Biology for Middle and High School Teachers** (Summer 1999, 2000: 11 students) - 3 credits (Team taught)

BOTANY 298A. Special Topics - **Phycology**. (Spring 1987: 3 students) Lecture, lab - 3 credits.

BOTANY 298B. Special Topics - **Phycology Field Trip**. (Summer 1987: 3 students). 1 credit.  
Continuation of BOTANY 298A at ocean field site.

BSCI 197, 198. **Biological Sciences Undergraduate Independent Research**. (Fall 2004: 8 students; Spring 2005: 7 students).  
Supervised student research projects for variable credit hours.

**UNDERGRADUATE RESEARCH SUPERVISION:** 21 students, Spring 1985 to present.

**INTERNSHIP SUPERVISION:**

Emilie Breugnot, graduate student, University of Paris – Summer 2001  
Adam Dow, undergraduate student, SUNY Potsdam – Summer 2002

**DISSERTATION COMMITTEES:** 32 M.S. and 10 Ph.D., Fall 1984 to present

**THESIS SUPERVISION:**

Laurie Gordon	M.S.	completed 1987
Alan Quackenbush	M.S.	completed 1990
Mark Borchardt	Ph.D.	completed 1991
Matt St. John	B.S.	completed 1992
Gregory Gustina	M.S.	completed 1996
Joseph Woerner	B.S.	completed 1997
David Kirschtel	Ph.D.	completed 2000
Bonsu Osei*	Ph.D.	completed 2005

\*(co-advised with Dr. Bentil in Mathematics)

## SERVICE EXPERIENCE

### COMMITTEES

#### **On-Campus:**

University Undergraduate Research Symposium – 1992.  
CALs Director of the Integrated Biological Science Program – 2002 to 2005  
CALs Director of the Biological Sciences Program – 2004 to 2005  
CALs/SNR/Extension Division Review - 1992 to 1993.  
CALs USDA Hatch Review Panel - 1993 to 1997, 2002.  
CALs Plant Biology Department Chair Review - 2007  
CALs Scholarship - 1993 to 1997.  
CALs Curriculum - 1991 to 1994.  
CALs Carrigan Award - 1991.  
CALs Honors - 1989 to 1991.  
CALs Computer - 1984 to 1985.  
CALs Faculty Standards - 1999 to 2002.  
CAS Zoology Department Chair Review - 1989.  
CAS Purple Howard Professorship committee (Chair) - 2001  
SNR Fisheries Biologist Search - 1995-1996  
SNR and CALs Aiken Lecture Series Planning Committee - 2001  
A.W. Mellon Undergraduate Research (Chair) - 1991 to 1996.  
Lake Champlain Science Center and Lake Studies Laboratory Planning Committee - 1994 to 1997.  
Vermont Water Resources and Lake Studies Center Advisory Committee – 1997 to present.  
Vermont Advanced Computing Center Advisory Committee - 2007  
Computer Science Department Graduate Student Admissions – 2003 to present  
Botany Department Chair Search – 1992, 2001.  
Botany Department Plant Ecologist Search (Chair) – 1993, 2001.  
Botany Department Teaching Fellowship - 1984 to 1993.  
Botany Department Space Allocation (Chair) - 1984 to 1993.  
Botany Department Curriculum (Chair) - 1992 to 2000.  
Botany Department Seminar Program - 1999 to 2002.  
Botany Department Undergraduate Program - 1997 to 1998.  
Plant and Soil Science Department Horticulturalist Search - 1995-1996

#### **Professional:**

International program committee for OICMS (biological modeling conference) – 2004 to present  
Phycological Society of America Education Committee - 1994.  
Sigma Xi Program Committee - 1991 to 1992.  
NASA plant biology panel review for Space Shuttle and International Space Station experiments.  
NSF, USDA, EPA proposal reviewer.  
Reviewer for the Journals of Phycology, North American Benthological Society, Water Resource Bulletin.  
Text reviewer for Worth Publishers and Benjamin/Cummings Publishing Company.  
Consultant to Algal Polymers Inc. on algal growth and reproduction - 1995.  
Consultant to Vermont legislature on nuisance aquatic plants - 1989.  
Consultant to Scitest Inc. and Wagner, Heindel and Noyes Inc on stream water quality – 1989.  
Developed (w/ E. Cassell and J. Drake) an all-day computer-modeling workshop for GSA – 2001.  
Organized an all-day [Evolutionary Computation workshop](#) at UVM - 2003

#### **Off-Campus:**

Town of Colchester, Malletts Bay Advisory Commission (Chair) - 1990 to 1994.  
Vermont Computer Club (150 members) Steering Committee - 1984 to 1987.