BRUCE R. FRIEDMANN
SENIOR ENVIRONMENTAL SCIENTIST

EDUCATION
- University of California, B.A. Zoology
- Southern Maine Vocational Technical Institute, Marine Science and Engineering

PROFESSIONAL AFFILIATIONS
- New York State Wetlands Forum
- Orange County Land Trust Stewardship Program

SELECTED PROFESSIONAL PUBLICATIONS AND PRESENTATIONS
- VanHeukelem, W.F., R.M. Harrel, S.G. Hughes, S. Lindell, and B. Friedmann. 2000. Optimal conditions for swimbladder inflation in striped bass larvae reared in intensive systems. Northeastern Regional Aquaculture Center. NRAC Pub. No. 00-006. Univ. Ma. North Dartmouth, MA. 5pp.
- Friedmann, B.R. and K. M. Shutty. 1999. Effect of timing of oil film removal and first feeding on swim bladder inflation success among intensively cultured striped bass larvae. N. Am. J. Aquacult. 61(1):43-46.
- Friedmann, B.R. 1995. Culture techniques for the large-scale production of intensively-cultured striped bass, *Morone saxatilis,* fry and fingerlings. Presented at Aquaculture '95. San Diego, CA. 1-4 February.
- Friedmann, B.R. 1995. Comparative aspects of the larviculture of North American temperate basses (Percichthyidae) and their hybrids. Presented at Aquaculturem '95. San Diego, CA. 1-4 February.

PROFESSIONAL EXPERIENCE
- **Senior Environmental Scientist, Ecological Analysis LLC. Middletown, NY.**
  → Collected environmental field data and prepared SEQRA documents for environmental impact analyses, including vegetation and/or wildlife surveys, ecosystem assessments and wetland delineations for projects in Sullivan County (Menderis Road, McKean Pond, and Westbourne Estates).

- **Environmental Scientist/Consultant, Tim Miller Associates, Inc. Cold Spring, NY.**
  → Collected environmental field data and prepared SEQRA documents for environmental impact analyses, including vegetation and wildlife field survey, ecosystem assessments and wetland delineations. Conducted stormwater runoff monitoring at construction sites. Project field sites were located within the lower Hudson River Valley in towns of Westchester, Putnam, Dutchess, Rockland, Orange, Ulster, and Sullivan Counties.

  → Protected species for which field and literature investigations have been conducted include:
    - Indiana bat (*Myotis sodalis*)
    - Bog turtle (*Clemmys muhlenbergii*)
    - Gray petaltail (*Tachopteryx thoreyi*)
    - Willdenow's sedge (*Carex willdenowii* var. *Willdenowii*)
    - Putty Root (*Aplectrum hyemale*)
    - Downey wood-mint (*Blephilia ciliata*)
    - Globe-fruited ludwigia (*Ludwigia sphaerocarpa*)
    - Virginia false gromwell (*Onosmodium virginianum*)
    - Hooker's orchid (*Platanthera hookeri*)
    - Wild comfrey (*Cynoglossum virginianum*)
    - Devil's bit (*Chamaelirium leuteum*)
    - Rattlebox (*Crotalaria sagittalis*)
    - Shining bedstraw (*Galium concinnum*)
    - Beaked agrimony (*Agrimonia rostellata*)
    - Narrow-leaved sedge (*Carex amphibola* var. *Amphibola*)

- **Aquaculture Research Supervisor, AquaFuture, Inc., Turners Falls, MA.**
  → Directly responsible for operations of research hatchery and staff at a 600,000 gallon indoor commercial culture facility for hybrid striped bass. Supervised research projects under the aegis of NOAA, USDA/NRAC, and USDA/SBIR programs, and the US-Israel Science and Technology Commission.

- **Biology Laboratory Manager, EA Engineering, Science, and Technology, Inc., Alexandria, Egypt.**
  → Directly responsible for daily operations of the environmental field and laboratory staff of the Alexandria, Egypt, Wastewater Treatment Program for USAID EIS. Supervised a field and laboratory staff of 12 Egyptian scientific professionals and technicians. Designed and directed development of program environmental database and provided related input to program reports.

- **Aquatic Biologist, EA Engineering, Science, and Technology, Inc., Newburgh, NY., and Texas Instruments Ecological Services, Verplanck, NY.**
  → Conducted aquatic and terrestrial field surveys in New York, New Jersey, Florida, and Puerto Rico. Supervised design, construction and operational phases for various freshwater and saltwater aquaculture and bioassay testing facilities.

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SELECTED PROFESSIONAL PUBLICATIONS AND PRESENTATIONS

- Friedmann, B.R., W.P. Dey, and S.M. Jinks. 1995. Use of oleophilic pads to achieve high swimbladder inflation percentages among intensively-cultured striped bass, Morone saxatilis. Poster session at Aquaculture '95. San Diego, CA. 1-4 February.
- Friedmann, B.R. 1994. Larviculture techniques for the large-scale production of intensively cultured striped bass fry and fingerlings. Presented at the 1994 Striped Bass Workshop of the Atlantic States Marine Fisheries Commission. Washington, D.C. 14-17 February, 1994.
- Friedmann, B.R. 1990. Intensive culture techniques for striped bass fingerlings. In Proceedings of a Workshop on Biology and Culture of Striped Bass (*Morone saxatilis*) (R.H. Peterson, ed.). Can. Tech. Rep. Fish. Aquat. Sci. 1832:vi + 66 pp.
- Dunning, D.J., Q.E. Ross, B.R. Friedmann, and K.L. Marcellus. 1990. Coded wire tag retention by, and tagging mortality of, striped bass reared at the Hudson River Hatchery. Am. Fish. Soc. Sym. 7:262-266.
- Mattson, M.T., B.R. Friedmann, D.J. Dunning, and Q.E. Ross. 1990. Magnetic tag detection efficiency for Hudson River striped bass. Am. Fish. Soc. Sym. 7:267-271.
- Kreamer, Q.L., B.R. Friedmann, and W.P. Dey. 1988. Larval striped bass (*Morone saxatilis*) mortality under intensive culture conditions - Evidence of the role of water composition and nutrition from tissue monitoring and diet-related phenomena. International Fish Health Conference. 19-21 July. Vancouver, B.C.

PROFESSIONAL EXPERIENCE - continued

→ Supervised freshwater and estuarine field studies for impact assessment of electric generating stations in New York and Florida watersheds. Performed trapping transects for marking and population estimates of small mammals. Supervised field collection activities for in situ vertebrate and invertebrate bioassay monitoring of sewerage effluent from Puerto Rican Sewerage Authority (PRASA) treatment plants.

→ Designed, constructed, and supervised a toxicology laboratory for the testing of freshwater bioassay organisms in accordance with the standard protocols of U.S. Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation (NYSDEC). Conducted Rapid Bioassessment Protocol (RBP) field fisheries surveys according to EPA RBP protocols. Field tested and conducted environmental risk assessment stream surveys according to NYSDEC Biothreat Model protocols.

→ Developed and applied relational database programs to integrate and track information for samples processed concurrently in multiple labs. Queried, extracted, and condensed data for presentation in tables and reports. Prepared quarterly and annual operating reports.

→ Prepared courtroom exhibits as staff assistant biologist during 316(b) adjudicatory hearings for Hudson River utility companies. Co-authored related multiplant impact reports for regional electric utilities, and provided data documentation and technical librarian research services as support functions for staff witnesses.

→ Responsible for hiring, training, daily scheduling and tasking of up to 25 scientific professionals and technicians.

INDUSTRIAL EXPERIENCE

- **Chemical Plant Operator, BASF Corporation. Peekskill, NY.**
  → Conducted plant operations at a coated mica manufacturing facility utilizing gas-fired belt furnaces, belt filters, bag houses, centrifugal separators, screw conveyors and tray dryers for a 10 metric ton (MT) daily production of specialty effects pigments for the automotive, cosmetics and plastics industries. Process operator at the facilities combined demineralized water plant and industrial pretreatment wastewater plant.

- **Chemical Plant Operator, Nepera, Inc., Harriman, NY.**
  → Conducted plant operations at a vitamin B3 manufacturing plant, a SCADA-controlled, FDA-regulated manufacturing facility utilizing high pressure/temperature reactors, crystallizers, centrifuges, compactors, mills, and packaging equipment for a 10 MT daily production.

- **Chemical Treatment Plant Operator, LMS Engineers, LLP., Pearl River, NY.**
  → Responsible for operational SPDES compliance of a SCADA-controlled waste metals removal pre-treatment system at an IBM computer chip manufacturing facility.