Qualifications Summary

- 15 years of research and consulting experience with industry, government, and scientific institutions
- Extensive field and laboratory research on nitrogen cycling in coastal environments and shellfish aquaculture
- Research and technical reporting on habitat restoration, aquaculture development, and carbon sequestration in coastal environments
- Experience with ecological risk assessment and natural resource damage assessment
- State and federal permitting, including preparation of Environmental Impact Statements
- Restoration planning for riverine and coastal dredging projects
- Coastal dune, vernal pool, and riparian corridor restoration planning, project construction and monitoring
- Collaboration with economists on a variety of projects including environmental policy analysis, program evaluation, and bio-economic model development

HEIDI J. CLARK, PH.D.

Environmental Scientist

Fields of Expertise

Research, technical writing, and project management for coastal and marine environmental issues. Technical specialties include field and desktop data collection, analysis, and reporting for all types of audience. Areas of scientific expertise include coastal water quality, aquaculture, nutrient cycling in terrestrial and coastal environments; contaminant fate and transport; contaminated site assessment, cleanup, and restoration; ecological risk assessment; natural resource damage assessment including habitat equivalency analysis, and environmental impact assessment; carbon emissions reduction and carbon trading analysis. Special interest and expertise in collaborating with economists, policy analysts, and others on multi-disciplinary projects.

Higher Education

Ph.D., Environmental Science-Yale University (2000)
M.F.S., Forest Science-Yale University (1997)
M.S., Exercise Science-University of Massachusetts (1991)
B.A., Biology-University of California, Santa Cruz (1987)

Employment History

2009-Present	Environmental Scientist, Woods Hole Group
2005-2008	Associate, Industrial Economics Incorporated
2003-2005	Coastal Scientist, Woods Hole Group
2001-2003	Guest Scientist, Woods Hole Oceanographic Institution
1995-2001	Self Employed Environmental Consultant
1996-1997	Aquaculture Technician, Marine Biological Lab
1995-2000	Guest Student, Woods Hole Oceanographic Institution

Key Projects

Literature Review and Database Development: Long Island Sound Dredged Materials Management Planning - Environmental Scientist
Project management and technical work on a review of literature on dredge materials management for Long Island Sound. Project includes collection of all relevant publications and gray literature, and summary of information in an Access database. The database and information therein will be used to develop a Dredged Materials Management Plan for Long Island Sound.

Remediation Project Support: New Bedford Harbor Superfund Site - Environmental Scientist
Project management, data collection, and technical reporting on New Bedford Harbor remediation dredging. Ongoing work includes field data collection, data analysis, and technical reporting on progress removing PCB contamination in New Bedford Harbor.

Carbon Sequestration and Carbon Trading in the Agriculture and Aquaculture Industries- Environmental Scientist/Project Manager
Project management, data collection, and technical reporting on carbon sequestration and trading on the Chicago Climate Exchange. Special emphasis on carbon sequestration and trading in the agriculture industry, and potential for carbon offset provision by the aquaculture industry.

Natural Resource Damage Assessment and Restoration Planning: Lead-Zinc Mining Sites in the Tri-State (Oklahoma, Missouri, Kansas) Area - Environmental Scientist
Assessment of damages to riverine resources resulting from lead-zinc mining. Work included data collection and analysis; evaluation of contaminant fate and transport, technical reporting, and support for litigation. Restoration planning included riparian corridor development and in-stream habitat improvement projects.

Natural Resource Damage Assessment: Kuwait Oil Damage from 1991 Gulf War- Environmental Scientist
Assessment of damages to coastal and marine resources resulting from oil released during the 1991 Iraqi invasion of Kuwait. Work included assessment of ecosystem services lost due to oil damage, estimates of recovery time, and development of appropriate restoration projects. Presented results to the United Nations Compensation Commission (UNCC) in Geneva.

Ecological Effects of Acid Deposition: Support for EPA's Retrospective Evaluation of the Clean Air Act and Amendments - Environmental Scientist/Project Manager
Review of literature on environmental damage due to acid deposition in the United States. Work included compilation of extensive database and annotated bibliography, as well as a written report on the subject.

Key Projects (continued)

Liquid Natural Gas (LNG) Deepwater Port Environmental Impact Statement (EIS): Support for US Coast Guard's EIS Development - Environmental Scientist/Project Manager

Preparation of Marine Resources sections of an EIS for a deepwater LNG port. Work included evaluation of pre-project conditions, potential impacts on fish, benthic communities, and other marine resources. Also included consultation with resource agencies regarding time of year restrictions on project construction, endangered species impacts, and essential fish habitat assessment.

Publications and Presentations

"Carbon Trading and the Aquaculture Industry: Potential (or Lack Thereof) for Shellfish Farmers to Provide Carbon Credits on the Chicago Climate Exchange". Report to Barnstable County Cooperative Extension. December, 2007.

"Bio-economic Model of Shellfish Aquaculture: Using Aquaculture as Part of a Comprehensive Nitrogen Management System for Coastal Watersheds on Cape Cod". Report to NOAA/CICEET. 2007.

"Economic Value of Natural Resource Services Potentially Impacted by a Change in Cooling Water Regime at the Haynes and AES Alamitos Generating Stations". Prepared for Los Angeles Department of Water and Power. May 2005.

"Monitoring and Assessment of the Environmental Consequences of the Iraqi Aggression in Kuwait: Damage Assessment Report". Prepared for Safege, Nanterre, France. May 2004.

Clark, H. and J. Kremer. 2004. "Estimating direct and episodic atmospheric deposition to a coastal waterbody". *Marine Environmental Research.* June.

Clark, H., W. Clark, D. Murphy, W. Burt, and D. Leavitt. 2002. "A review of seagrass restoration programs and technologies with reference to application on Cape Cod". *Environment Cape Cod* October.

Clark, H. 2002. "Seagrass Restoration on Cape Cod: Review of Appropriate Methods and an Eelgrass Planting Trial for Eastham Harbor". Summer 2002.

Clark, H. 2000. "Ecological Risks Associated with Nutrient Loading in Coastal Waters: Reducing the Risks by Restoring Shellfish". Ph.D. Dissertation, Yale University.

Clark, H. 1999. "Fate and ecological effects of nitrogen in coastal waters" *in* Industrial Economics, Inc. "Benefits Assessment of Decreased Nitrogen Deposition to Estuaries in the United States Attributable to the Clean Air Act Amendments, 1990-2010". Work Assignment 4-11, Task 7 for the US Environmental Protection Agency, Section 812 - Prospective Ecological Benefits Assessment of the CAAA.

Publications and Presentations (continued)

Vogt, KJ. Gordon, J. Wargo, H. Clark and collaborators. 1997. Ecosystems: Balancing Science and Management Springer, New York.

Johnson, K., K.A. Vogt, H.J. Clark, O.J. Schmitz, D.J. Vogt. 1996. "Biodiversity, and the Productivity and Stability of Ecosystems" *Trends in Ecology and Evolution* 11(9):372-377.

Clark, H. and G. Wikfors. 1996. "Oysters as processors of particulate organic nitrogen: quantitative and qualitative relationships between inputs and outputs" *Journal of Shellfish Research I15(2):457.*