

NOAA National Center for Research on Aquatic Invasive Species



Aquatic invasive species (AIS) are a global problem that threaten the economic security of the United States by changing and reducing the beneficial uses that society makes of coastal ecosystems and by adding to the time and cost of conducting commerce and trade related to coastal ecosystems. AIS will frustrate NOAA's strategic goal of developing ecosystem forecast capabilities and improving ecosystem-based management. In order to maximize the effectiveness and benefits of NOAA's research investments towards understanding, preventing, responding to, and managing AIS invasions in U.S. coastal ecosystems, the NOAA National Center for Research on Aquatic Invasive Species was established in July 2003. The Center is administratively housed at the Great Lakes Environmental Research Laboratory (GLERL) in Ann Arbor, Michigan, and functions in conjunction with the NOAA Invasive Species Program managed at NOAA headquarters in Silver Spring, Maryland.

Background and Rationale

The pathways by which AIS reach U.S. coastal ecosystems all involve human activities, especially those related to commerce and trade. Annual costs to the U.S. economy have reached 100s of millions of dollars per year and are increasing. Solutions to the widespread AIS invasions and problems they cause are already impacting both the costs and policies related to global commerce and trade. Congress (Public Law 101-646 as amended) and the White House (Executive Order 13112, February 1999) both identified aquatic species invasions as a problem of national significance requiring federal action.

NOAA is a science-based agency under the U.S. Department of Commerce whose mission is to understand and predict changes in the Earth's environment and conserve and manage coastal and marine resources to meet our Nation's economic, social, and environmental needs. NOAA is one of several Federal agencies that was given joint responsibility for developing and implementing a national invasive species response and action plan. Public Law 101-646 established the National Aquatic Nuisance Species Task Force and assigned NOAA as Co-chair. NOAA also performs the Department of Commerce's responsibilities as Co-chair of the National Invasive Species Council, assigned by Executive Order 13112. Therefore, it is appropriate that NOAA assures the effectiveness and maximizes the value of its research investments on this issue.



Zebra mussels are called the "poster child" for aquatic invasive species because their invasion of the Great Lakes in the late 1980s led to major policy initiatives at the National level in the U.S.



Veined Rapa Whelk (Rapana venosa), was first reported in Chesapeake Bay in 1998. Rapa whelks are predatory snails that eat a variety of mollusks and often attack bivalves (oysters, clams, mussels), thus threatening shellfisheries in Chesapeake Bay. (Picture courtesy of Dr. J.M. Harding, Virginia Institute of Marine Science, Gloucester Point, VA used with permission.)

Mission and Program Elements

The NOAA National Center for Research on Aquatic Invasive Species was established to provide leadership, communication, and coordination for the agency's research investments in support of understanding, preventing, responding to, and managing AIS invasions in U.S. coastal ecosystems. NOAA's goal to protect, restore, and manage the use of coastal and ocean resources through ecosystem-based management and forecasting cannot be achieved in ecosystems that are being changed and destabilized by aquatic species invasions. The Center's mission is to promote, coordinate, and support AIS research throughout and across NOAA. It functions in conjunction with the NOAA Invasive Species Program managed at NOAA headquarters in Silver Spring, Maryland.

The proposed long-term elements of the Center include (1) Regional Coordination to ensure NOAA's AIS research is national in scope but responsive to regional issues and priorities, by establishing a NOAA AIS Regional Coordinator in each of six major U.S. coastal regions (east coast, west coast, Great Lakes, Gulf of Mexico, Alaska, and Hawaii), (2) Enhancement of core-capabilities by establishing and managing 1-3 year Post-doctoral and Visiting Scientist research positions

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Ships' ballast tanks were the major vector for nonindigenous species introductions to the Great Lakes during the latter half of the 20th century. In addition, evidence suggests that the residual water and mud found in many ballast tanks is also a potential source for species invasions.

Activities and Progress - CY 2005

The Center conducted several new projects under NOAA Invasive Species Program funding:

Database Summit: A workshop for federal or federally-funded invasive species database managers was held in September 2005. A working group (Non-Indigenous Aquatic Species Database Working Group (NIASDWG)) of the Summit participants representing 10 databases and NISbase (<http://www.nisbase.org/nisbase/index.jsp>) was formed. NIASDWG members identified and agreed upon a long-term goal to move the working group toward integration into a Network for greater coordination of processes and data-streams, formalization of data-sharing agreements, and development of joint proposals for database expansion.

Ballast Water Exchange Report to Congress: NCRAIS initiated organization and preparation of a Congressionally mandated report evaluating the effectiveness of ballast water exchange (BWE) in protecting the Great Lakes and Chesapeake Bay. NCRAIS has responsibility for coordinating the preparation of the complete report and for drafting a Great Lakes analysis, while the Smithsonian Environmental Research Center is responsible for preparing an analysis of what is known about ballast water exchange and performing the Chesapeake Bay analysis. The final report will be submitted to Congress during 2006.

Great Lakes Aquatic Nonindigenous Species Information System (GLANSIS): The Great Lakes Aquatic Nonindigenous Species Information System (http://www.glerl.noaa.gov/res/Task_rpts/2003/nsreid10-3.html) was expanded to include 36 updated nonindigenous species fact sheets. A proposal to the Great Lakes Fishery Trust was funded that will allow further expansion of the updated fact sheets.

to provide a regular renewable influx of cutting-edge of AIS science and understanding into NOAA's research units, and (3) encouraging a broad NOAA platform of AIS research to assure that NOAA's Invasive Species Program is supported by sound scientific data, expert knowledge, and state-of-the-art understanding.

A close working relationship between the Center, the National Sea Grant Program, and NOAA's Cooperative Institutes Program will enhance NOAA's ability to accomplish its mission and goals by coordinating research priorities, leveraging resources towards common interests, and fostering joint research enterprises between NOAA scientists and university or private sector scientists.

Aquatic invasive species, for the most part, originate outside the borders of the U.S., and thus, invasive species are an international problem requiring international cooperation. Often the only information about an invasive organism is found in the scientific community of the source ecosystem or country. The AIS Research Center will help identify partnership opportunities between U.S. and foreign scientists. It will encourage and support collaborative research planning and projects, sharing of scientific information, and research projects to identify means of interdicting AIS introduction to the U.S.

Administration and Staff

The Center is administratively housed at the Great Lakes Environmental Research Laboratory in Ann Arbor, Michigan, which has been conducting research on invasive species since 1989. GLERL has a long history of research on invasive species and supports a broad program of AIS research covering prevention, ecosystem impacts and forecasting, and monitoring. NCRAIS will partner with and draw on the expertise and resources of NOAA's invasive species program, Sea Grant Program and Cooperative Institutes Program. Staff assigned to the Center include:

- ◆ Dr. David Reid, Director
- ◆ Dr. Rochelle Sturtevant, Great Lakes Regional Coordinator, Outreach and Education Lead
- ◆ Dr. David Raikow, Research Ecologist
- ◆ Dr. Doran Mason, Gulf of Mexico and SE Atlantic Regional Coordinator

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