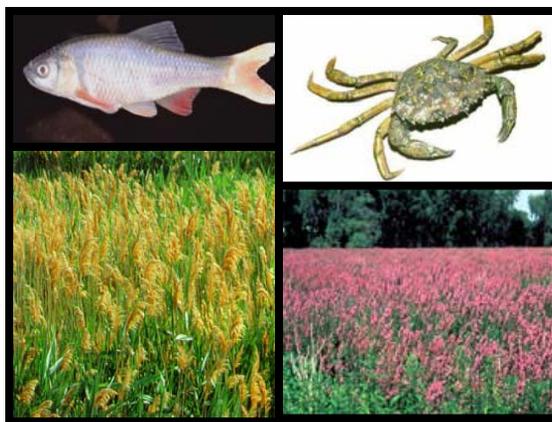


NERL Invasion Biology Research

Objectives:

- Implement novel and emerging approaches to the study of non-indigenous species
- Integrate cross-divisional expertise to develop an invasion biology program focusing on early detection, monitoring and vulnerability analysis



Photos courtesy of Shellfish Ecology Lab, University of Washington and The Nature Conservancy

Approaches:

- Detect invasive plant species from remotely sensed data; Dr. Ricardo Lopez (LEB, Las Vegas)
- Detect invasive species and characterize invasion events using DNA-based molecular techniques; Drs. Michael Blum and Mark Bagley (EERD, Cincinnati)
- Evaluate the ecological, genetic and behavioral mechanisms of invasion through field studies and mesocosm experiments; Drs. David M. Walters and Michael Blum (EERD, Cincinnati)
- Model invasion dynamics and ecosystem vulnerability from population and landscape perspectives; Drs. Brenda Rashleigh (ERD, Athens) David M. Walters (EERD, Cincinnati), Betsy Smith (ESD/ReVA, RTP), Daniel Kluza (NCEA/ReVA, DC)

Rationale:

Biological invasions by non-indigenous species (NIS) constitute one of the leading threats to natural ecosystems and biodiversity. Invasion events may result in rapid loss of native biodiversity via ecological or genetic replacement of native species. Besides having ecological consequences, invasion events also disrupt agricultural, recreational, and industrial enterprises, and therefore can impose significant costs on local and national economies. Human health may also be threatened by the spread of NIS that are infectious agents or that act as vectors of pathogens.

The Environmental Protection Agency currently does not maintain an agency-wide policy on invasive species, principally because it is unclear whether NIS can be defined, and therefore regulated, as pollutants. However, even a conservative interpretation of the Clean Water Act provides the EPA with a mandate to limit the spread of NIS and remediate the impact of invasion events if NIS act as biological impairments to aquatic ecosystems by disrupting or threatening indigenous communities.

Invasive species are considered to be one of the two most important environmental stressors in aquatic ecosystems. Building on its long experience and nationally recognized expertise on evaluating exposure of aquatic ecosystems to environmental stressors, NERL recently initiated several research projects with the explicit aim of developing integrative approaches for detecting and monitoring invasive species. This cross-divisional research directly interfaces with programs such as ReVA, and therefore stands to strengthen and diversify NERL-client relations. By demonstrating a record of customer driven research, these efforts may also facilitate an initiative that will provide opportunities for building an EPA invasion biology program.

Contacts:

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