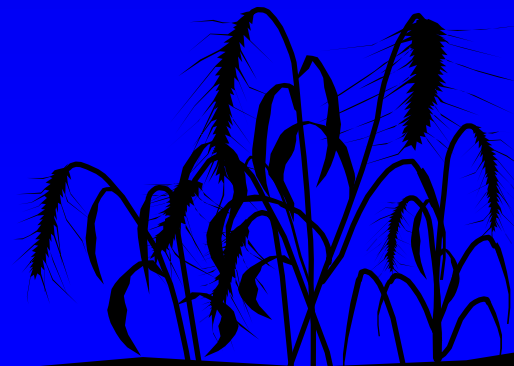
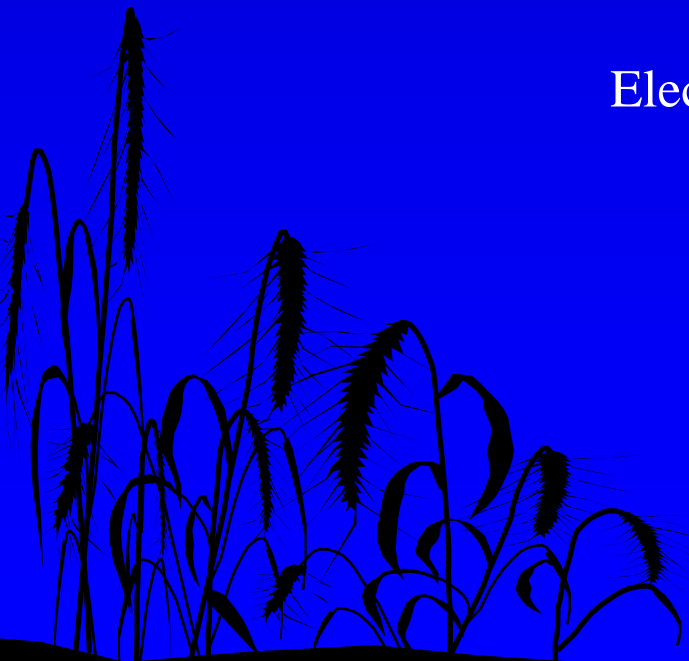


Biodiversity and Ecosystems Informatics Workshop for the Indian River Lagoon

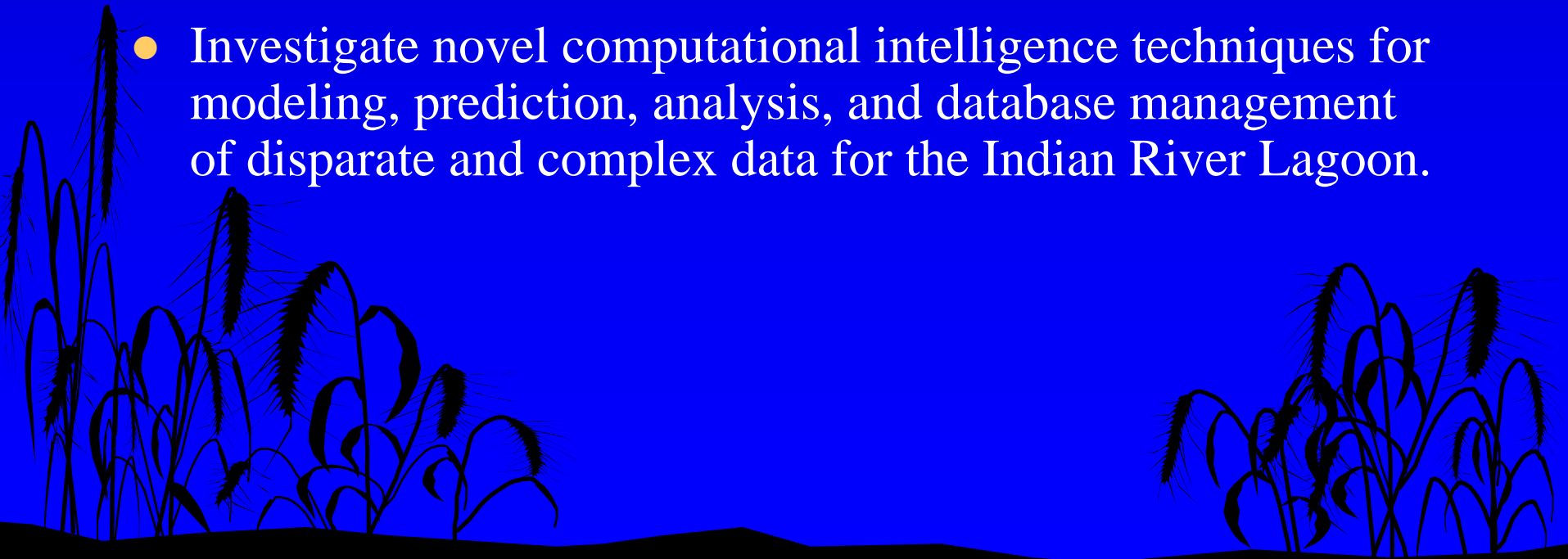
NSF EIA 0131889

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University of Maine



Objective of the Workshop

- Identify areas that are fundamental in making progress toward new research directions in the field of biodiversity and ecosystem informatics.
- Investigate novel computational intelligence techniques for modeling, prediction, analysis, and database management of disparate and complex data for the Indian River Lagoon.



Workshop: Venue and Participants

- February 7-8, 2002 in Cocoa Beach, Florida.
- 26 Participants including scientists from computer, biological and ecological sciences and policy makers.



Participants representing:

- National Museum of Natural History
- Dynamac Corp., NASA Kennedy Space Center
- Hubbs-Sea World Research Institute
- NASA Stennis Space Center
- Smithsonian Environmental Research Center
- Smithsonian Marine Station
- South Florida Water Management District
- St. Johns Water Management District
- University of Central Florida
- University of Florida
- University of Maine.

Indian River Lagoon (IRL)

- Extends for 253 km from temperate to subtropical/tropical climate.
- Is one of the nation's most biologically diverse estuarine systems that provides a habitat for hundreds of different species of animals and plants, many of which are rare or endangered
- Is the site of:
 - Merritt Island National Wildlife Refuge (MINWR),
 - Canaveral National Seashore,
 - Pelican Island National Wildlife Refuge,
 - Archie Carr National Wildlife Refuge,
 - EPA's National Estuarine Program, and
 - NOAA's National Estuarine Research Program nomination.
- Has one of the highest human population growth rates within the United States.

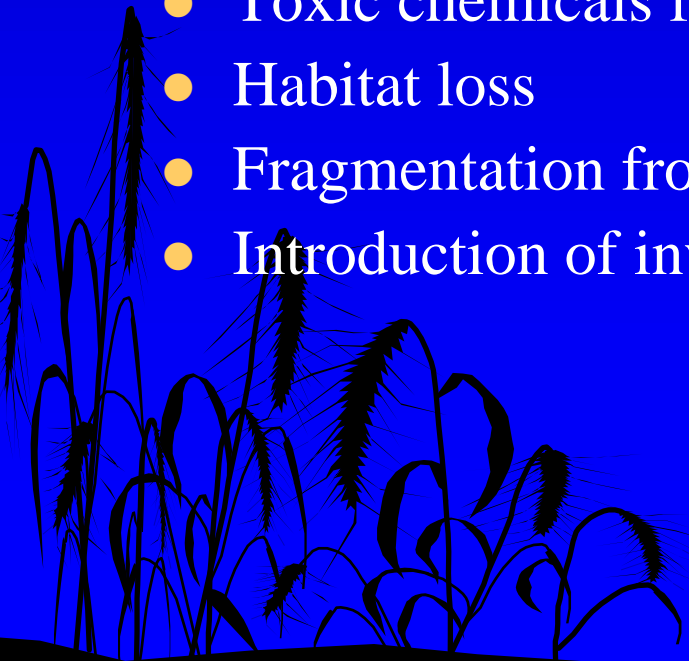


IRL Species Inventory

Phylum:	Species	%
Plants	289	11.0
Protists	555	21.1
Animals	1785	67.9
Total:	2629	100.0

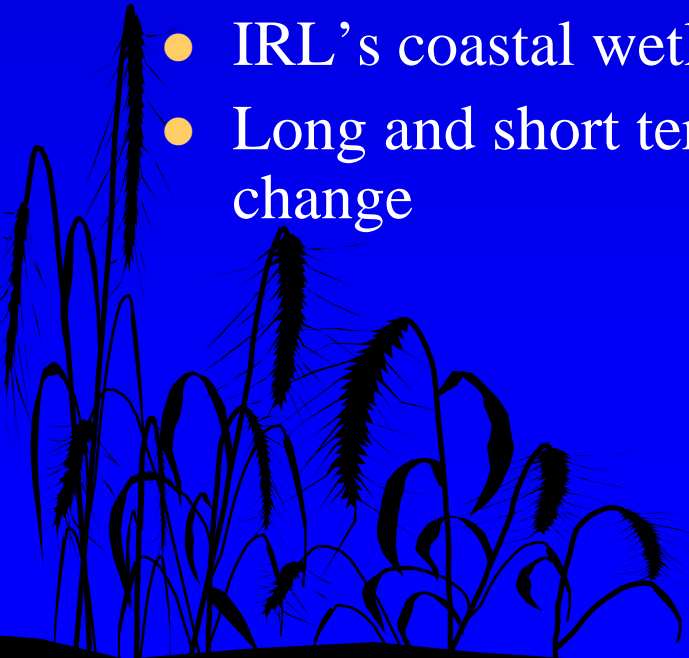
IRL Environmental Issues

- Eutrophication from surface water runoff
- Excessive freshwater inflow due to watershed management practices
- Toxic chemicals from agricultural and urban development,
- Habitat loss
- Fragmentation from development
- Introduction of invasive exotic species



Biological and Ecological Topics

- Biocomplexity and spatial heterogeneity of the IRL
- IRL's regional geomorphology
- Social and physical factors affecting IRL
- IRL species inventorying
- IRL's coastal wetland rehabilitation
- Long and short term seagrass change versus land use change



Informatics Topics covered

- Type of data available, tools and methods used in data collection
- Problems encountered in collecting data
- Integration of heterogeneous data at structural and semantic levels
- Automated change detection techniques using digital imagery to update geospatial databases
- Agent based models of complex ecosystems
- Integrated modeling system
- Using neural networks, fuzzy systems and genetic algorithms in ecological applications

Data

- Extremely large and widely distributed data sets are available from sources such as:
 - NASA KSC data bases:
 - remote sensing data and submerged aquatic data
 - Water Management District data bases such as:
 - water quality and seagrass distribution
 - Smithsonian Environmental Research Center (SERC) data bases
 - Species datasets
- Investigate the data format, accessibility and usability for further processing



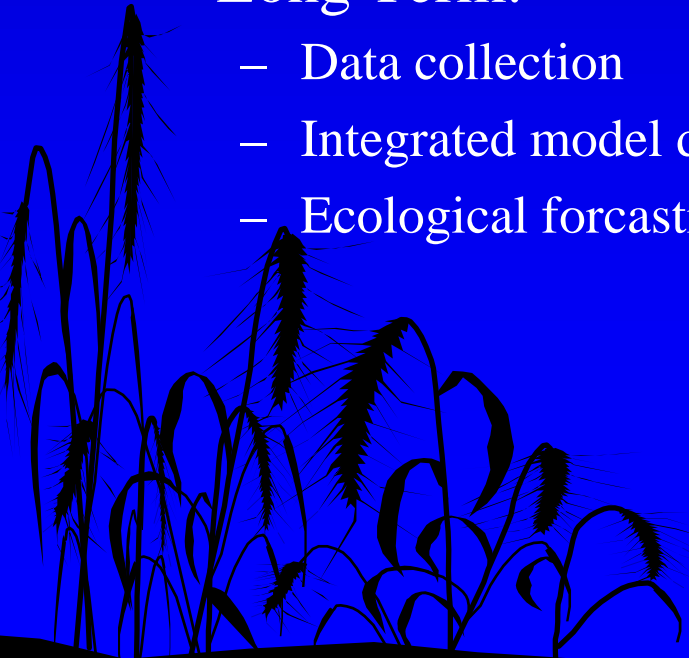
Modeling

- One integrated modeling effort for the IRL was presented
(Integrated modeling system CH3D-IMS of the IRL)



What is needed?

- Short-Term:
 - Data accessibility, format and adequacy
 - Modeling for prediction of known processes
- Long Term:
 - Data collection
 - Integrated model development
 - Ecological forecasting



IRL Informatics Future Plans

- Future research efforts in three potential areas based on the following data:
 - Submerged aquatic data and water quality data of the Water Management Districts and NASA remotely sensed data,
 - biological species inventory data housed by the Smithsonian Environmental Research Center (SERC)
 - Ichthyological data from long term studies by KSC-Dynamac Corp.
- Exchange of the available data from the IRL with the computational scientists for effective data management, modeling, analysis and synthesis.
- Identifying funding requirements and potential to leverage resources.