

ISDRES: Invasive Species Detection, Reporting, and Education System

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Invasive Species Initiative &
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Collaborators/Acknowledgements

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- **Phyllis Higman** and **Ed Schools**, Michigan Natural Features Inventory, Lansing, Michigan

Acknowledgements

Funding: Michigan State University Invasive Species Initiative and the Environmental Science & Public Policy Program's Environment Research Initiative granting program.

Development

Steven Crisp, MSU (GIS and Information Technology)



ISDRES

Concept

Develop a scalable Internet-based platform for invasive species detection, survey, reporting, education, and training. To be used by regulators, managers, researchers, and citizen scientists.

Rational

With the increasing threat of alien invasive species it has become clear that early detection, education, and the ***transparency*** of survey data are important tools in the management and mitigation of alien invasive species. The ISDRES platform is seen as a means of increasing the success of current AIS mitigation efforts and the early detection of future species in the state of Michigan.



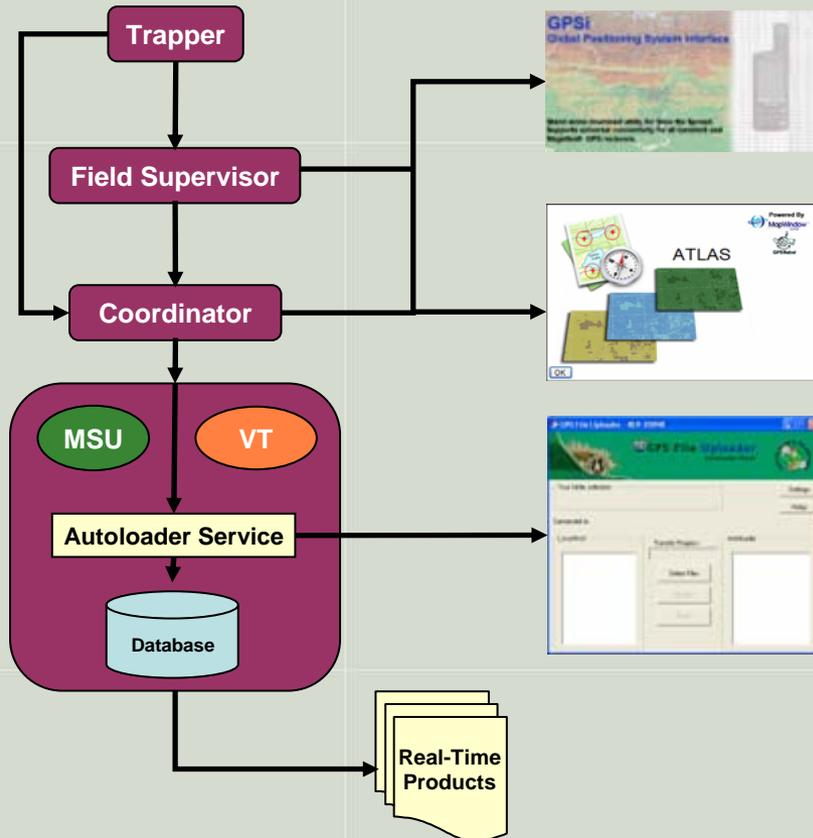
Background

Developing ISDRES based upon the experiences gained over the past 15 years involved in the development of the operational framework for the USFS National Slow the Spread of the Gypsy Moth Project.

This includes experience in:

- Distributed database design
- Survey and QA/QC protocols
- Geo-database design and GIS analysis
- IT infrastructure development
- Application development
- GPS/PDA implementation

Data Visualization / Transfer

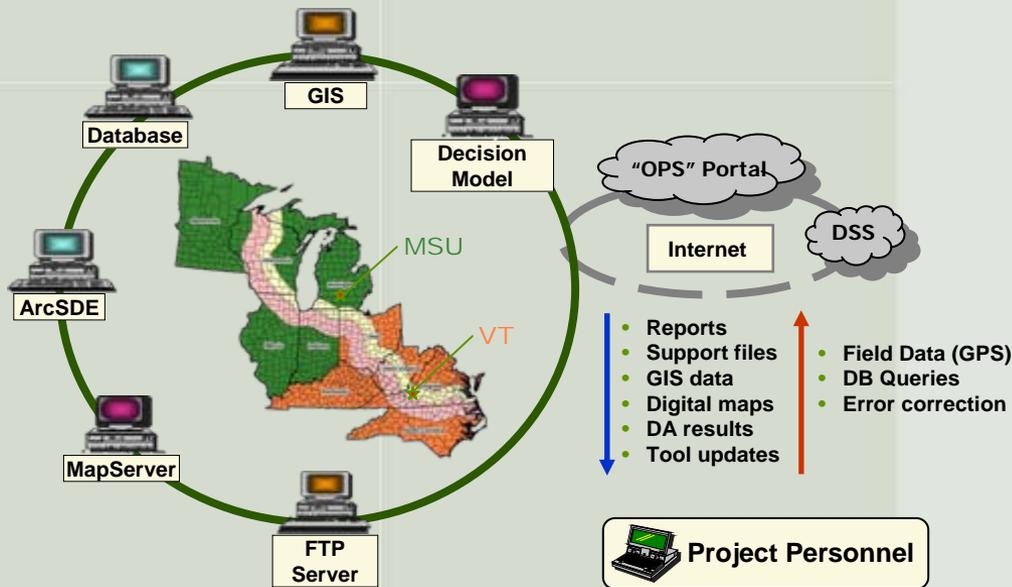


GPSi is a lightweight custom application used to download Garmin and Magellan GPS receivers. It provides ease of use and helps maintain the integrity of the data file.

Atlas is an integrated application use to download, visualize and upload field data. It integrates the functionality of both GPSi and the autoloader client.

GPS File Uploader is a custom application that serves as a client to the Autoloader Service hosted at the database nodes. The client performs local file management, structural validations, and allows for error correction before submission.

Stakeholder/Project Interactions



STS Cooperators can interact with trapping data at many points within the data life-cycle. This is typically done through access provided by project web resources. Cooperators can access both raw data and data derived products in support of their role in the STS project.



ISDRES

The **ISDRES** web site can be found @ MichiganInvasives.info and will be composed of the following primary modules:

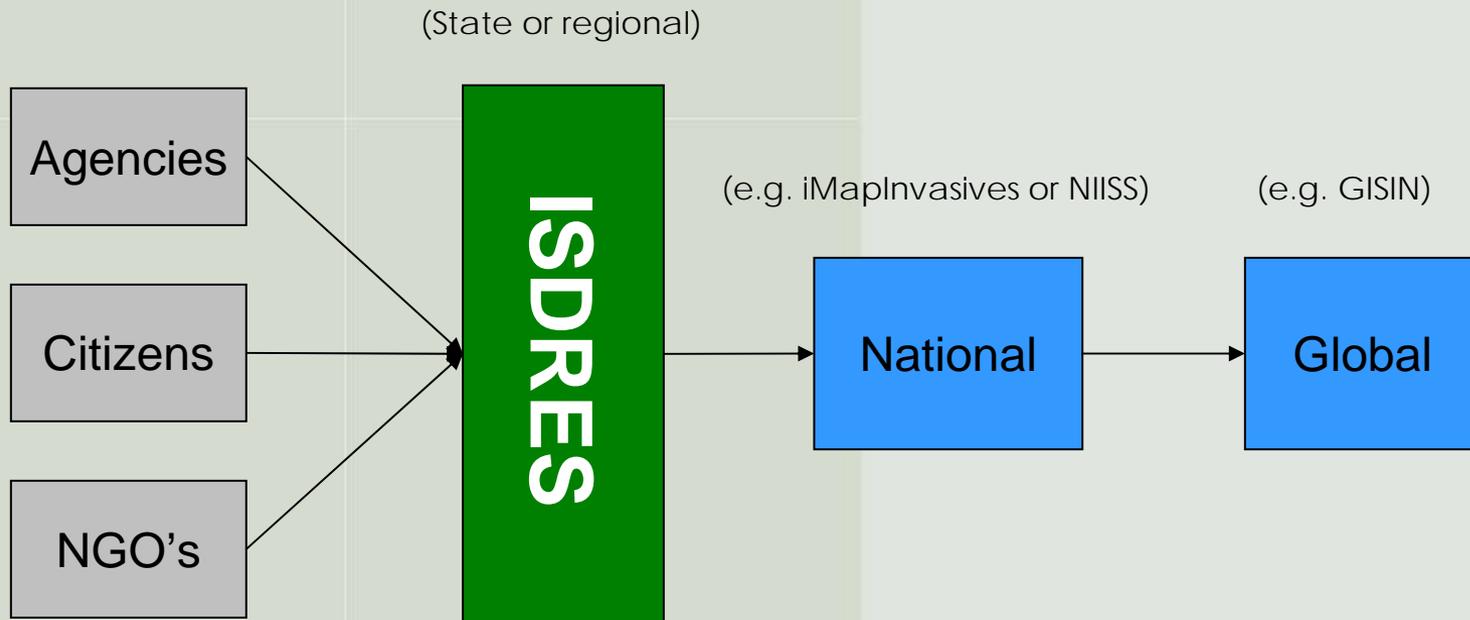
* **Detection**: Allows authenticated users the ability to enter observations using the ISDRES map server.

Reporting: Provides public and registered users with tabular and map enhanced reports of AIS observations.

Training: Instructs citizen scientists in the detection and survey of AIS target species, as well as the recording of observations in the ISDRES system.

* **Education**: Provides AIS based outreach materials.

ISDRES Data Flow





ISDRES / Detection

Status

- Developed beta version of ISDRES detection module
- Beta testing of detection module through spring 2008
- Further development of data standards

Overview

- Interactive map-based data entry
- Secure login / user centric
- UMN Mapserver / PostgreSQL PostGIS
- State-wide DRG and NAIP raster composites

Secure access to the data entry mapping application is provided. A parallel public mapping application will be available without data entry functions in support of data browsing.

MI Invasives Demo Site - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://invader.cevl.msu.edu/fist/fistMain.php?site=mi_invader

msu invasive species

Michigan Invasives.info
Helping citizens detect and manage invasive species

Home Layers Legend About Login

requires registration Welcome Guest Not a member yet? Register here.

Michigan Invasives.info
Helping citizens detect and manage invasive species in Michigan

Garlic mustard: Researchers are testing biological controls to stop this woodland pest.

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Username:
Password:

Michigan Invasives.info is a consortium of organizations interested in fostering education and management of invasive species in Michigan.

Invasive of the month ... Hydrilla
Hydrilla verticillata
(A potential Great Lakes invasive species)

Hydrilla is a submerged aquatic plant that has invaded waterways in at least 19 U.S. states. If hydrilla spreads to Michigan, it could quickly overwhelm waterways, causing severe ecological and economic impacts.

Michigan boaters, anglers, swimmers and waterfront property owners are asked to be on the lookout for hydrilla. [Learn more...](#)

Information prepared by: Doug Landis, Amos Ziegler and Rob Ahern, Department of Entomology, Michigan State University, Phyllis Hgman and Suzan Campbell, Michigan Natural Features Inventory. Funding support: MSU Environmental Research Initiative, the Michigan Agricultural Experiment Station, MSU Extension, and the MSU IPM Program. [Read disclaimer.](#) Web development: Amos Ziegler and J.N. Landis, MSU IPM Program. Updated: 08/13/07

Active Layer: Counties
Map Scale: 1 : 3,927,567 (Change scale)

Done

Example invasive observations – attributes retrieved using identity tool

The screenshot shows a Mozilla Firefox browser window titled "MI Invasives Demo Site - Mozilla Firefox". The address bar displays the URL http://35.9.159.55/fist/fistmain.php?site=mi_invasives. A secondary window titled "http://35.9.159.55 - Identify Results - Mozilla Firefox" is open, showing the following data:

Identify Results	
Layer: sightings	
Displaying records: 1 - 1 of 1	
gid	1154
sitename	1124-6
observer	PH
exotic	SPOTTED KNAPWEED
landcover	Deciduous Forest
spatialpat	Scattered
density	80
scientific	CENTAUREA MACULOSA
comments	oak
disturb	Road
date	

The map shows a region of Michigan with several counties labeled: Charlevoix, Antrim, Montmorenci, Kalkaska, Grayling, Oscoda, Wexford, Missaukee, Roscommon, and Ogemaw. Red dots representing sightings are clustered around Grayling and Kalkaska. A toolbar with various map navigation tools is visible above the map. A status bar at the bottom of the map window shows the active tool as "Zoom In", the active layer as "sightings", and the map scale as "1 : 609,183 (Change scale)".



MI Invasives Demo Site - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://35.9.159.55/fist/fistmain.php?site=mi_invasives

STS-ISC
Slow the Spread Information Systems Group

About Legend Layers Help Logout

Digitize Point

2. Add attributes to the point.

Field	Value	Data type
sitename	<input type="text"/>	text
observer	<input type="text"/>	text
exotic	<input type="text"/>	text
landcover	<input type="text"/>	text
spatialpat	<input type="text"/>	text
density	<input type="text"/>	text
scientific	<input type="text"/>	text
comments	<input type="text"/>	text
disturb	<input type="text"/>	text
date	<input type="text"/>	text

Active Tool: Digitize point

Active Layer: sightings

Map Scale: 1 : 9,345 ([Change scale](#))

Done

Digitized invasive observation

Associated attributes. Locations and attribute information stored within geo-database in real-time

ISDRES / Education

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Michigan Invasives.info

Helping citizens detect and manage invasive species in Michigan

Japanese beetles damage fruit and landscape plantings.

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Garlic mustard

Alliaria petiolata

Habit: Upright, herbaceous biennial growing up to 1 m (3ft) tall.

Leaves: Simple, alternate, triangular, toothed; lower leaves kidney shaped with palmate venation, 2-12 cm long, scalloped edges, arranged in a basal rosette; upper leaves stalked.

Stems: Up to about 1 m (3ft); typically one flowering stem per rosette but may be more.

Flowers: Numerous, small, white, 4-petaled; usually in clusters at the tops of stalks, sometimes in leaf axils; bloom late April-early June.

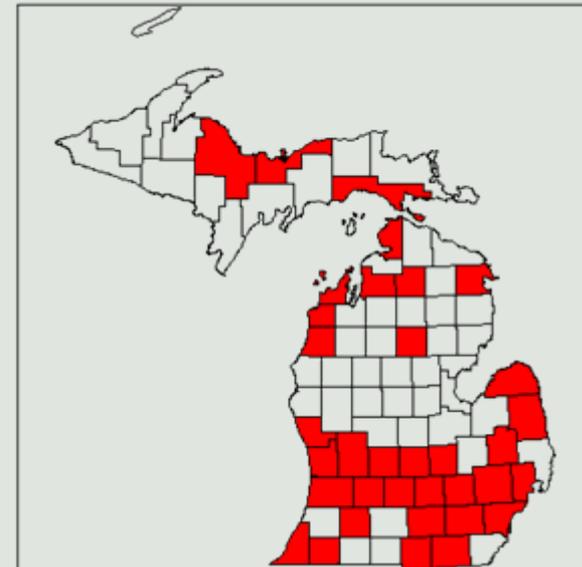
Fruit and seeds: Seeds are small, dark brown/black; in long narrow capsules (siliques); one plant can produce up to 3,000 seeds; seeds viable within a few days of flowering and remain viable up to seven years; two germination periods - one in mid-spring and another in late summer.

Habitat: Found in upland and floodplain forests, savannas, along trails, roadsides and disturbed areas; shade tolerant but also found in full sun; spreads rapidly.

Reproduction: Prolific seeding, preferentially outcrosses but may self; produces basal rosette the first year, flowers the second year.



Adapted from MNFI
“Invasive Plants of Michigan”



County level presence data
derived from herbarium records.



Future Directions

- Continue partner development
- ArcGIS Server / SDE development
- Explore system regionalization
- Integration with national and global AIS efforts

For Further Information

ISDRES

<http://MichiganInvasives.info>

MSU Invasive Species Initiative

<http://www.InvasiveSpecies.msu.edu>

