

Development of a Comprehensive Decision Support System for Florida's Coral Reef

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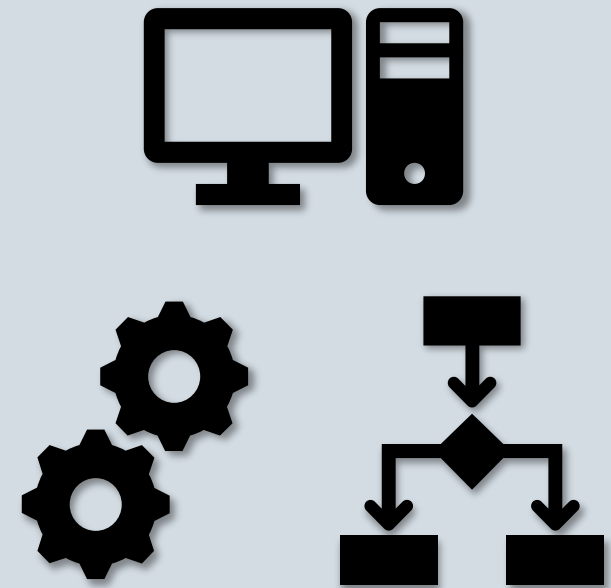
Florida's Coral Reef Decision Support System

Under the new FCRRP framework, management seeks to address multiple thematic areas affecting Florida's Coral Reef

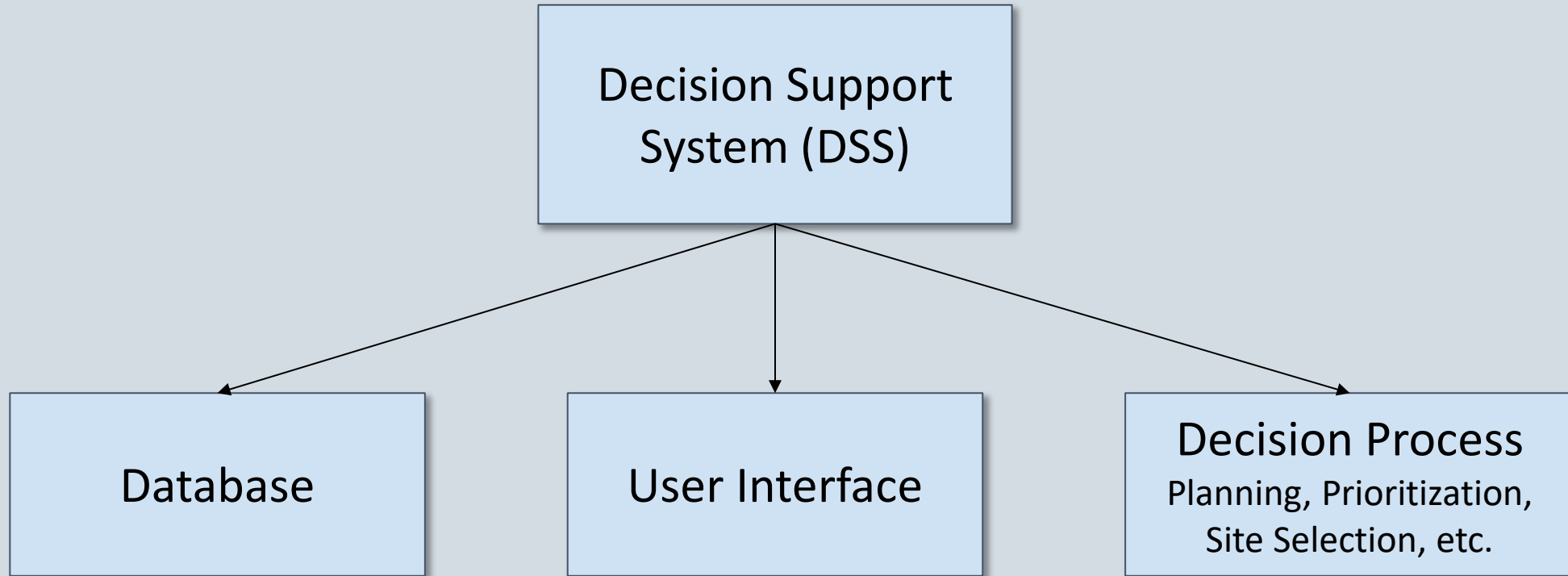
- Disturbance Response, Ecosystem Restoration, Water Quality, Adaption

A decision support system (DSS) can assist by:

- Integrating data and knowledge
- Assisting with robust and complex decisions
- Visualizing intricate relationships
- Preserving decision history
- Guiding research priorities
- Engaging the public and stakeholders



Florida's Coral Reef Decision Support System



DSS Development

Year 1 Goals (FY24-25):

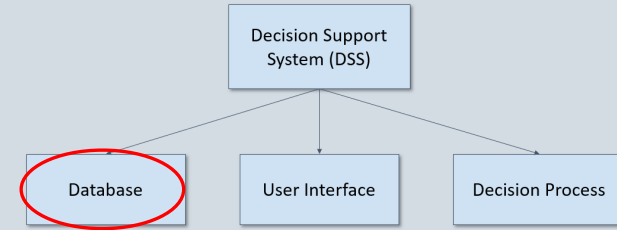
- Develop first iteration to aid restoration practitioners with site selection prioritization processes
- Build and test the DSS structure
 - Data hosting framework and services
 - Data exploration and cartography tools
 - Administrative tools
- Create data filtering functionality and develop reporting outputs
- Iteratively test the system and solicit feedback from stakeholders
- Train admins and users



Coral Reef Decision
Support System

Funding: DEP CRCP #C3D266

Database

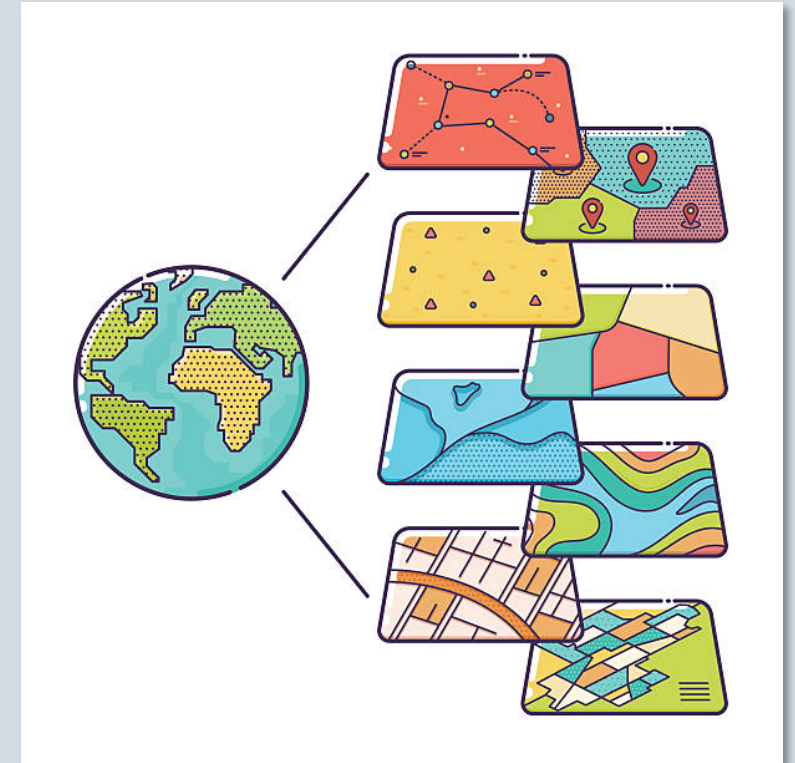


NSU GIS & Spatial Ecology Lab

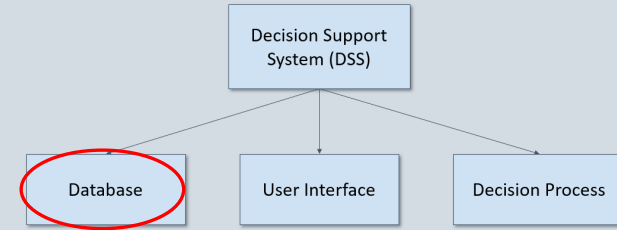
- Dr. Brian Walker, Samantha Buckley
Maya Becker, Zachary Niedermaier

Provide GIS support:

- Inventory, review, and update data layers
 - Expanded from Marine Planner in SEFL to entire FCR
- Identify and gather missing data
- Coordinate with partners to incorporate new geospatial data
 - The Nature Conservancy, Tetra Tech
 - Federal & state monitoring programs



Database



Develop a data layer for FCR and code with relevant datasets

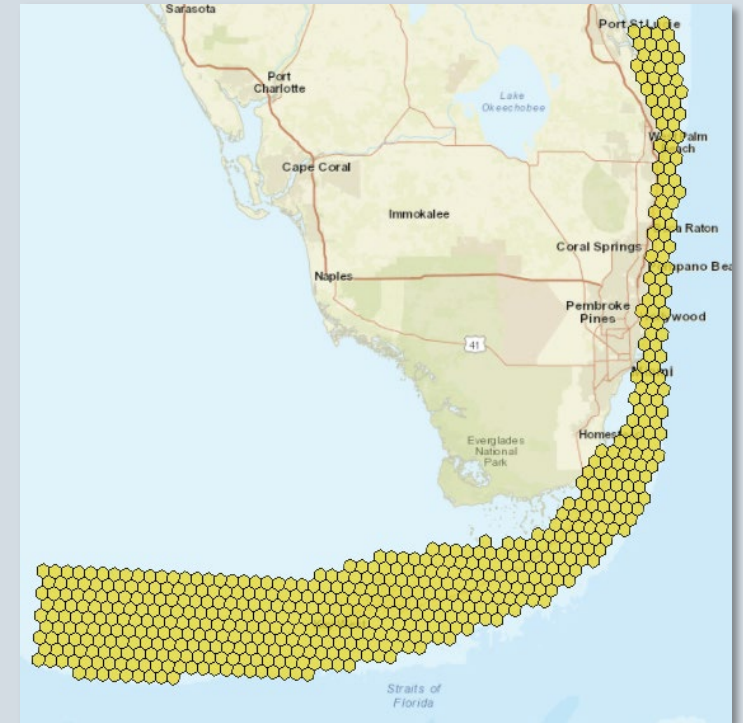
- H3 Hex grid developed by Uber
- Uniquely indexed cells
- Aggregate by spatial scale

Fixed number of cells displayed at one time

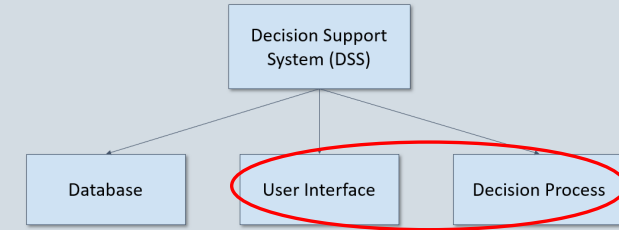
- Quick for visualization and filtering

Finest resolution $\approx 45\text{m}^2$ square grid

- Similar size to existing FCR-wide data products such as NCRMP grid



User Interface & Decision Process



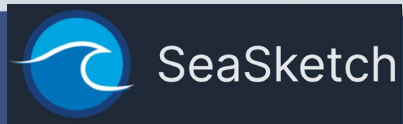
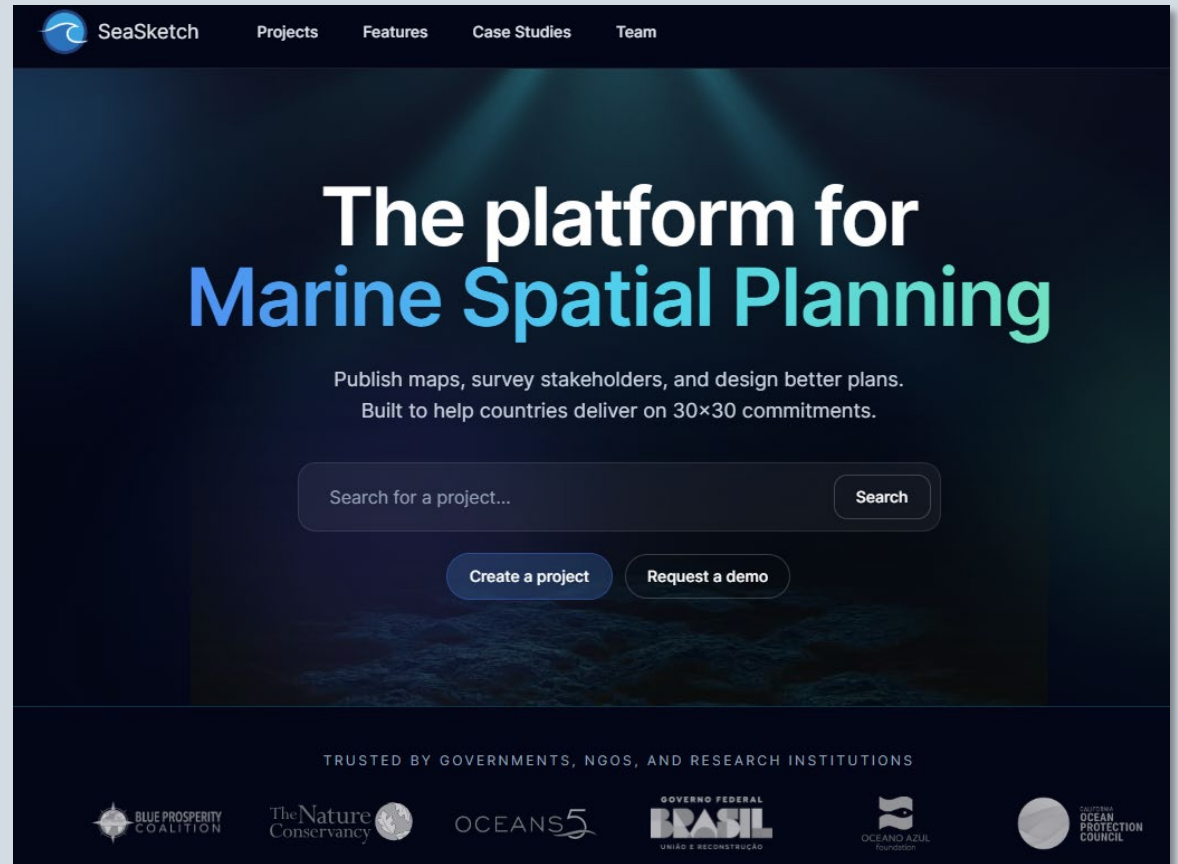
Request for Proposals

System Requirements Matrix:

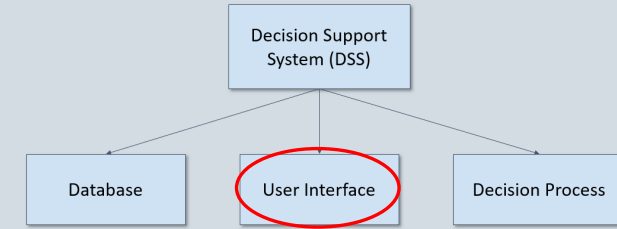
- User roles
- System functionality
- Management goals
- Security requirements

Awarded:

- The Spatial Collaborative
 - Dr. Will McClintock, Chad Burt
 - UC Santa Barbara
- SeaSketch (seasketch.org)

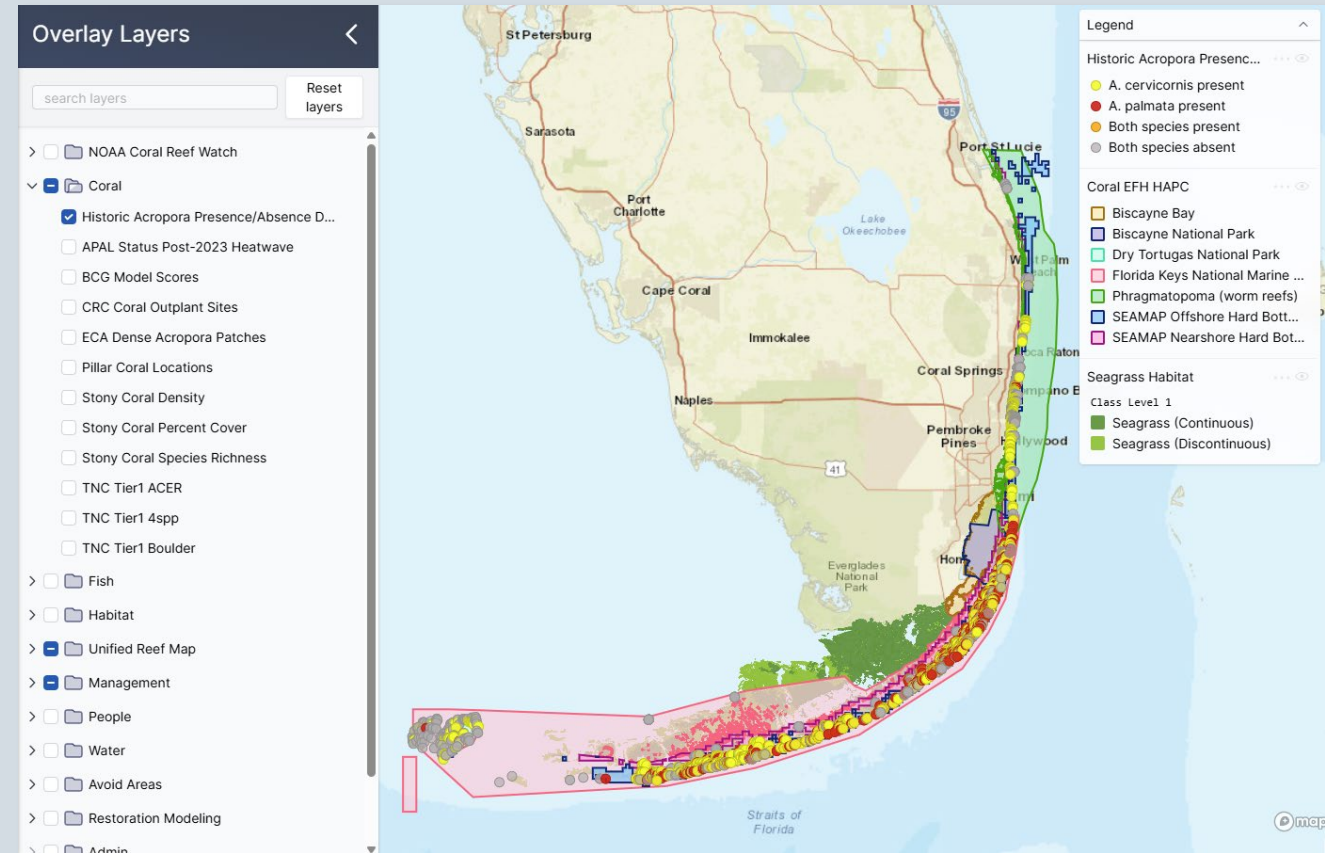


User Interface & Decision Process

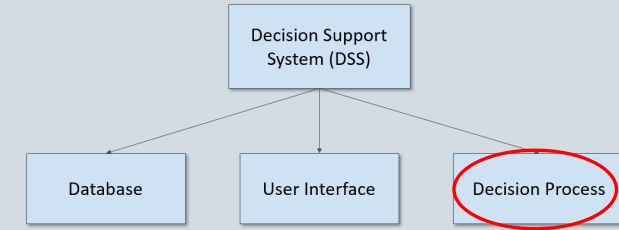


Display data relevant to the management objective

- Nine data categories
 - ex. Coral, Fish, Habitat, Management
- Search, measure, z-order, change cartography & basemap
- View metadata, download data layers, bookmark map
- Discussion forums
 - Share maps & products

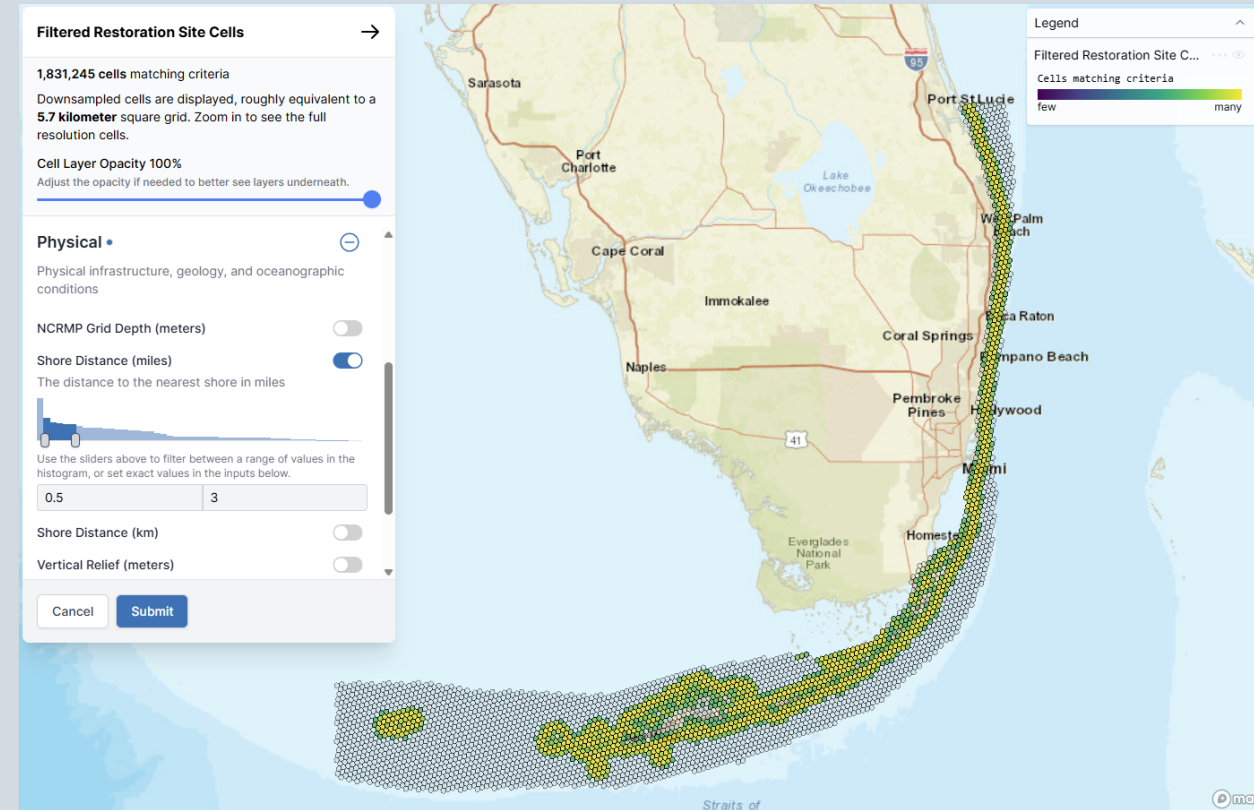


User Interface & Decision Process

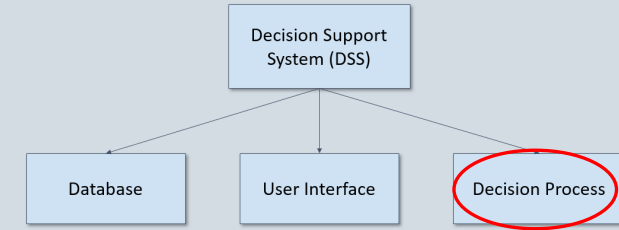


Filter grid based on restoration criteria

- Biological, Physical, Human, Management
- Turn filters on/off, move sliders or manually input value range
 - Shore distance = 0 – 3 miles
 - Max stony coral density = 1 – 5%
 - Mooring buoy available = True
- Cells matching criteria are dynamically filtered
 - Potential suitable restoration locations
- Cells are grouped based on scale



User Interface & Decision Process



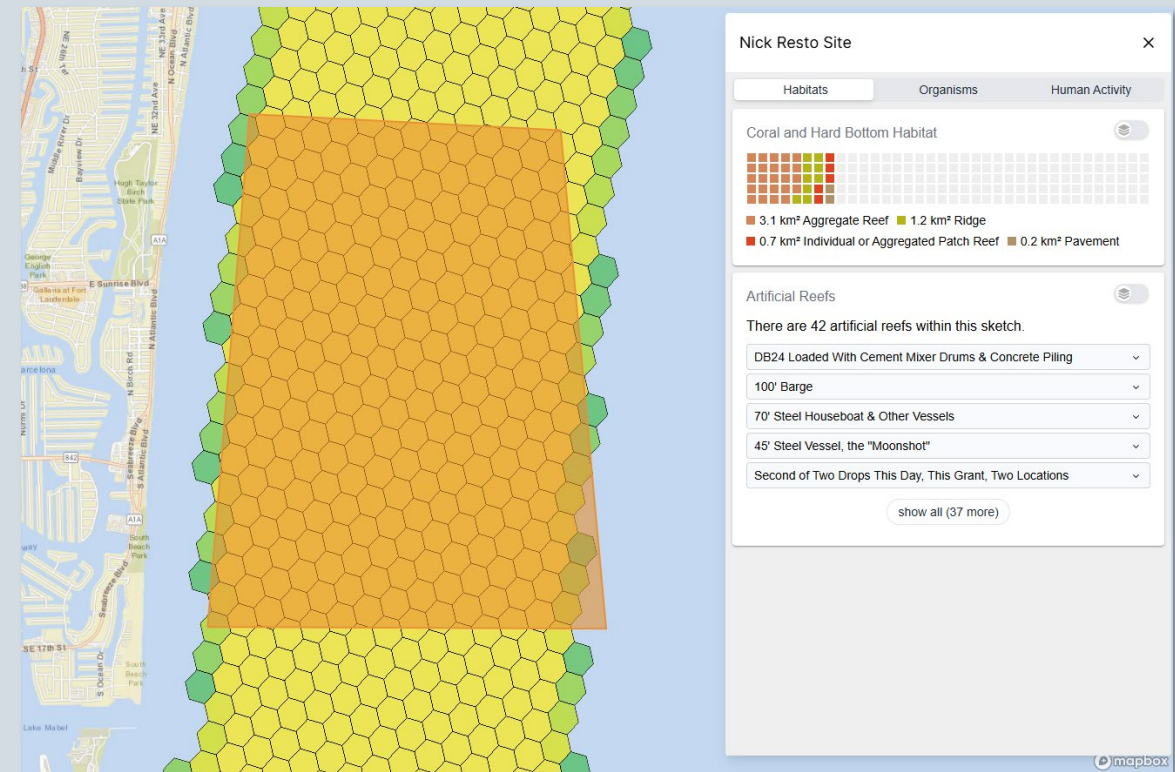
Digitize restoration site and report on underlying data

- Habitat, Organisms, Human Activity
- View layers that overlap with site

Reports can be species-specific based on outplanting criteria

- Still under development

Each result is stand-alone and can be saved & shared so users can recreate the process



Florida's Coral Reef Decision Support System

Minimal requirements for partners

- Spatial data products feed into the DSS
- Multiple data types are supported

Modular & reusable

- Connected but independent data & tools
- Any component can be reused

Nimble design

- The system is designed to be adaptable
- Incremental development based on management and research needs



DSS Development

Year 2 (FY25-26):

- Continue to build and test the decision framework for coral restoration site prioritization
 - Expand to other areas, based on management objectives
- Further update datasets and grid layer
- Enhance administrative tools
- Refine site selection requirements & reporting outputs
- Continue to solicit and implement user feedback
 - Looking for beta-testers (nicholas.alcaraz@myfwc.com)



seasketch.org/crdss/app

