

Comprehensive Everglades Restoration Plan (CERP) Data Management

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Presentation Outline



BUILDING STRONG

- The Comprehensive Everglades Restoration Plan (CERP)
- RECOVER – The Science Behind the Plan
- CERP Data Management
- Lessons Learned



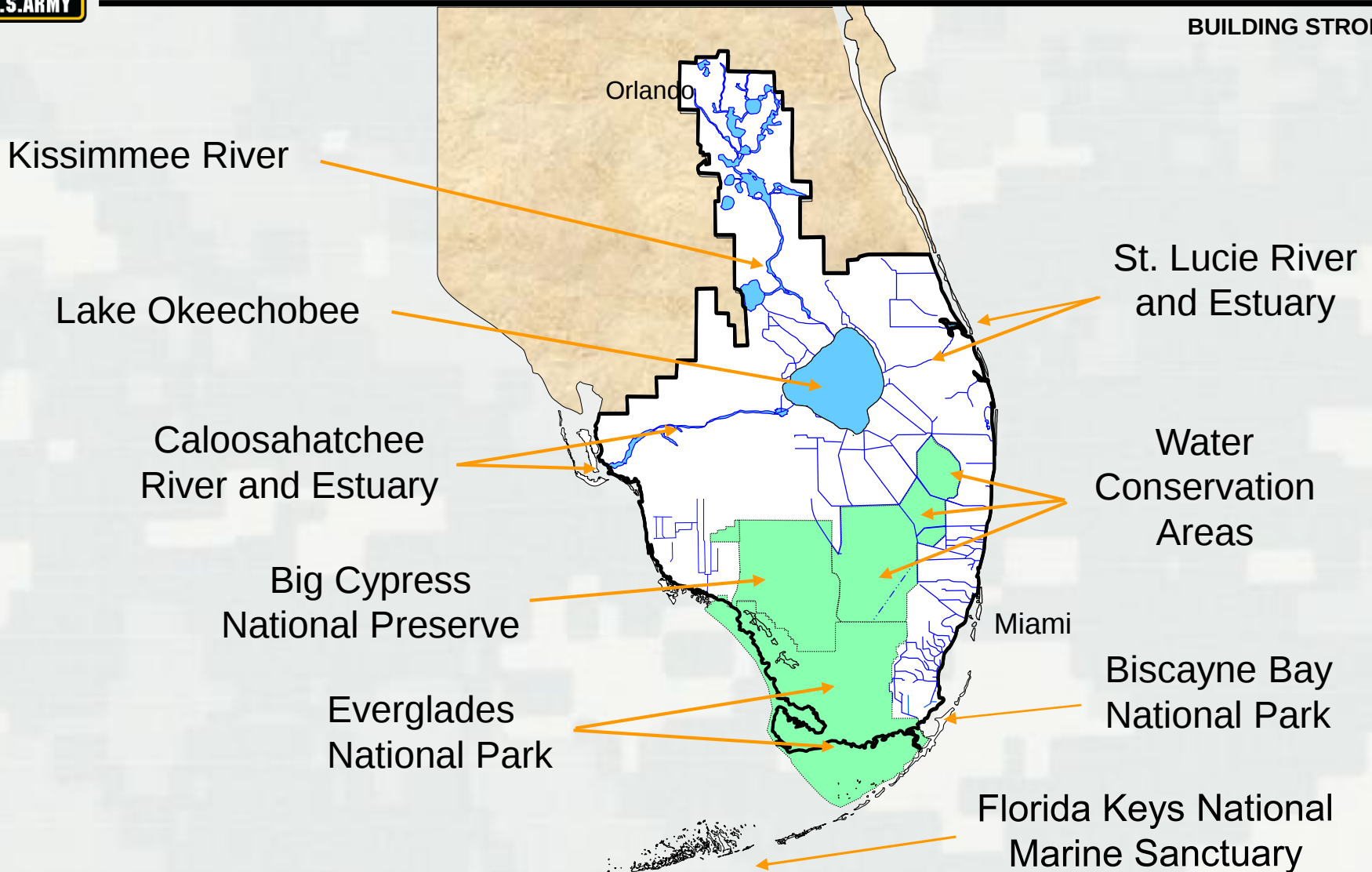
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Greater Everglades Ecosystem



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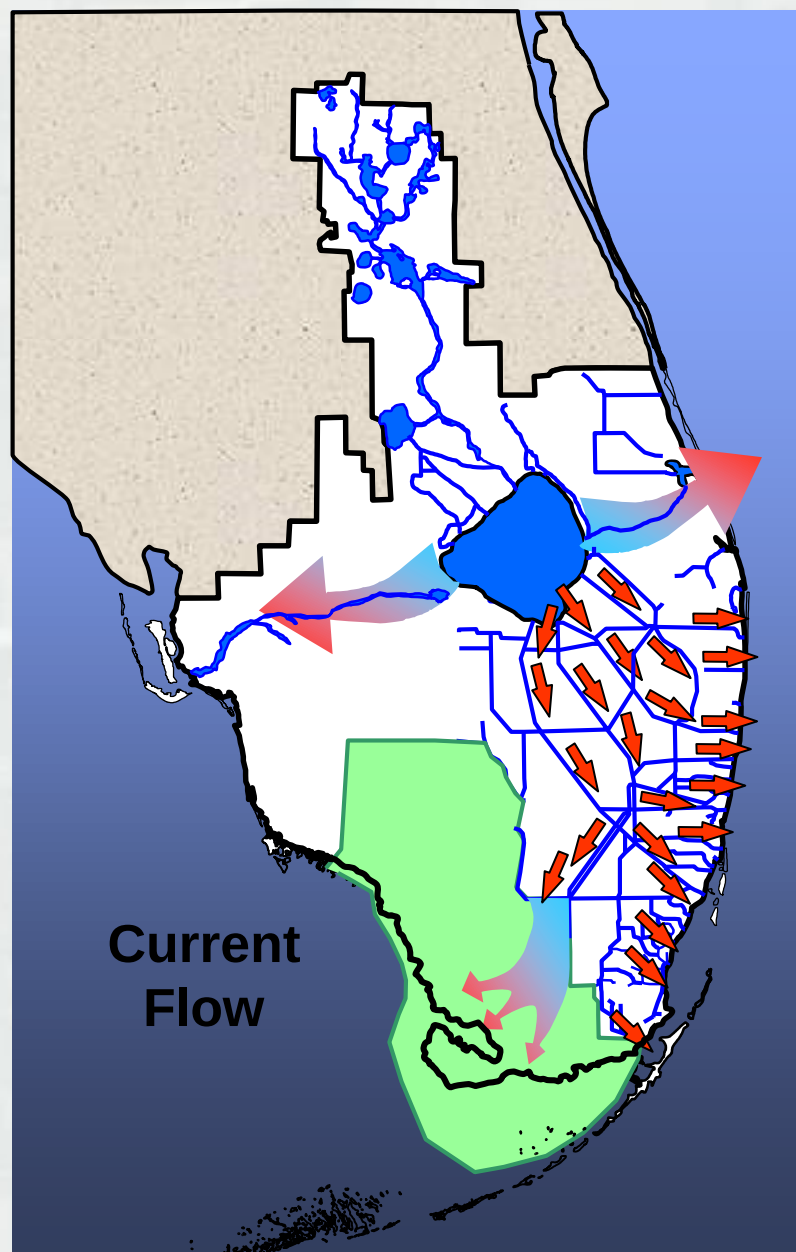
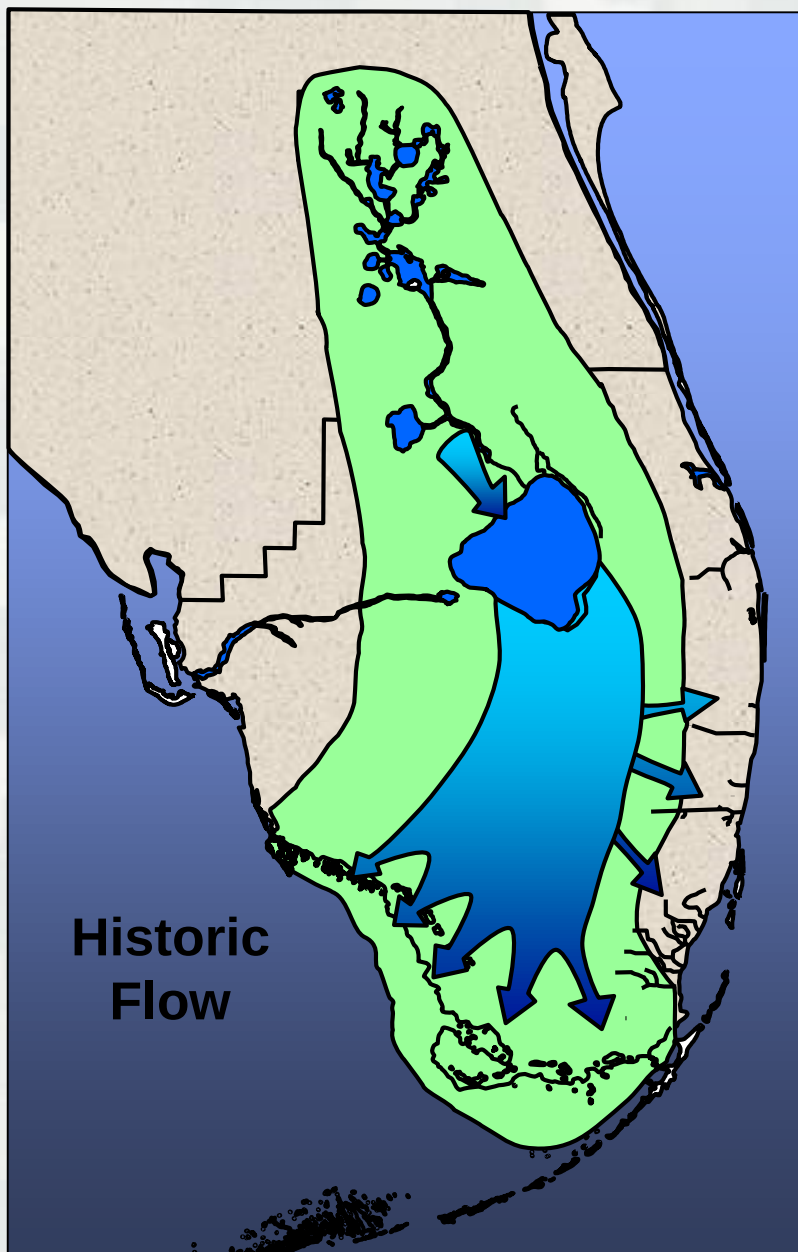
The Everglades Ecosystem



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System Modifications





An Ecosystem in Trouble....



- Too much or too little water for the South Florida ecosystem
- 1.7 billion gallons of water per day is lost to the ocean
- Declining estuary health
- Massive reductions in wading bird populations
- Degradation of water quality
- Loss of native habitat to invasive exotic vegetation
- 70 Federally-listed threatened and endangered species





Comprehensive Everglades Restoration Plan (CERP)

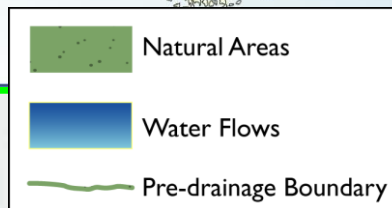
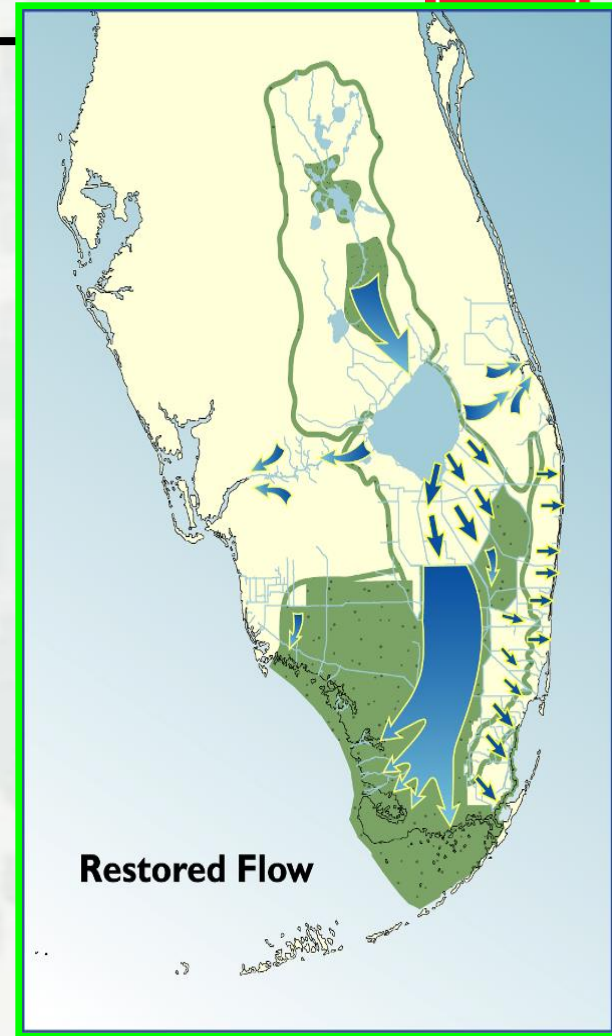
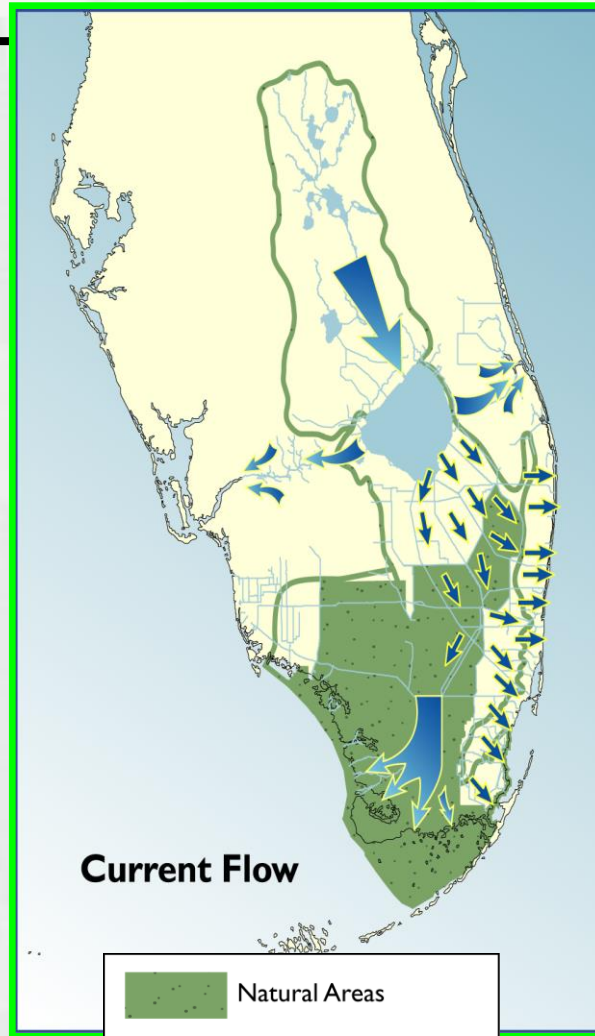
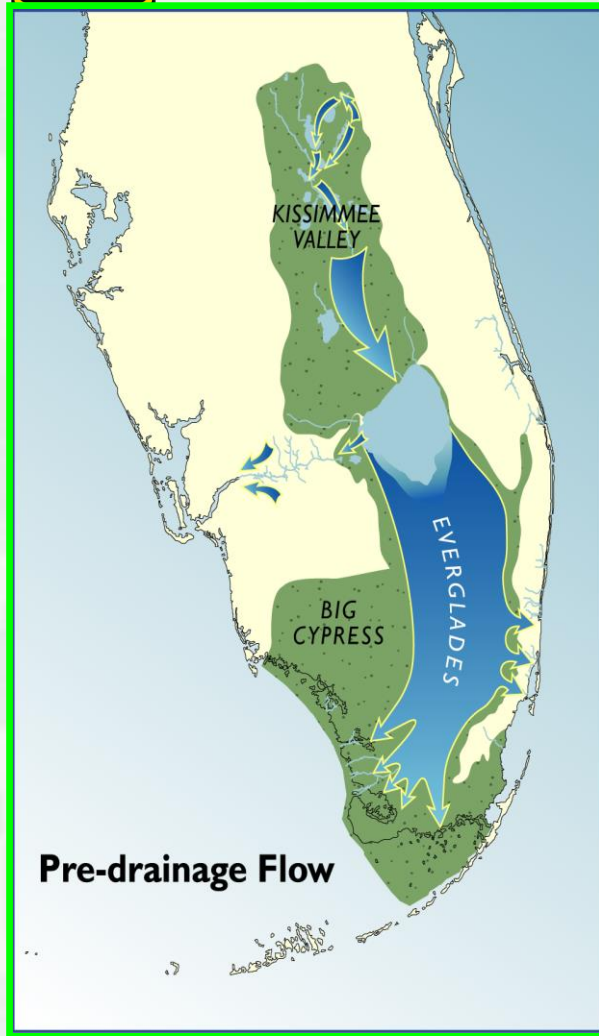


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- Restoration, preservation, and protection of the South Florida ecosystem
- Restore appropriate quantity, quality, timing and distribution of flows
- Large spatial scale
- Highly diverse mosaic of plant communities
- Dynamic storage and sheetflow
- Wet and dry hydrologic cycles
- Ecosystem adapted to low amounts of nutrients (oligotrophic)
- Adaptive Management framework



CERP Restoration Vision



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CERP System-wide Science



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REstoration COordination and VERification



Why RECOVER?

- *Science Behind CERP*
- *Communicates and coordinates the results of these evaluations and assessments*
- *Scientific support for decision-making*

“Science will be the foundation of restoration.” – 2003 Programmatic Regulations

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RECOVER



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- Interagency and interdisciplinary
- Ensure CERP implementation is guided by the best available science
- Programmatic and system-wide perspective
- Collaborative and consensus-based
- Three Major Components
 - Planning - integrating RECOVER with planning and operation of the system
 - Evaluation - forecasting project performance through predictive modeling and performance measures
 - Assessment - measuring performance of projects through research and monitoring

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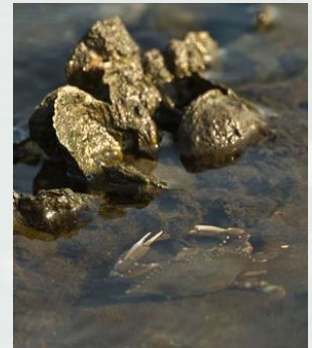
CERP Monitoring



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Monitoring and Assessment Plan (MAP)

- Holistic description of the status of the Everglades ecosystem
- ~35 monitoring components
 - Ecological, biological, water quality
 - Within and cross-regional monitoring
 - Leverages monitoring from other agencies
- Heart of the CERP Adaptive Management (AM) Program
- Summary of ecosystem changes as they relate to CERP goals and objectives
- Identification of major unanticipated findings



Project-level Monitoring

- Project-specific, smaller scale



Assessment of Monitoring Data



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- System Status Report – Biennial Assessment of the Everglades and South Florida Ecosystem
 - ▶ Synthesis of technical data from geographic regions
 - ▶ Assessment of data as it relates to system-wide hypotheses and Interim Goals
 - ▶ Determination if the goals and objectives of CERP are being met
 - ▶ Identification of unanticipated results and potential remedies for consideration



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- ▶ Lake Okeechobee
- ▶ Northern Estuaries
- ▶ Greater Everglades
- ▶ Southern Coastal Systems

- # Data Types

- Hydrological data
- Ecological data
- Water Quality data





Data Management Issues



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- A significant number of environmental monitoring data records generated by CERP Projects and Program
- Data encompasses many different disciplines: biology, ecology, hydrology, water quality
- Data collected for many different purposes: regulatory, baseline, cultural resources, system-wide understanding, hydrodynamic modeling, etc.
- Data currently housed in many different locations: individual desktops, file cabinets, CDs, file servers, originating agency, etc.
- Similar data currently available in different formats: Excel spreadsheets, Access/Oracle databases, pdf tables, paper copy tables, etc.



Impact



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- Months must be spent by several individuals to locate and collate needed data to answer specific questions: System Status Report, Biological Opinions, Cultural Resource reviews, application of Adaptive Management policies, etc
- Additional information gathered by associated projects or programs are not leveraged by each other: don't know its there
- Loss of efficiency in performing seemingly easy assessments of the projects and program and consequently, timely application of adaptive management



Data Management Goals



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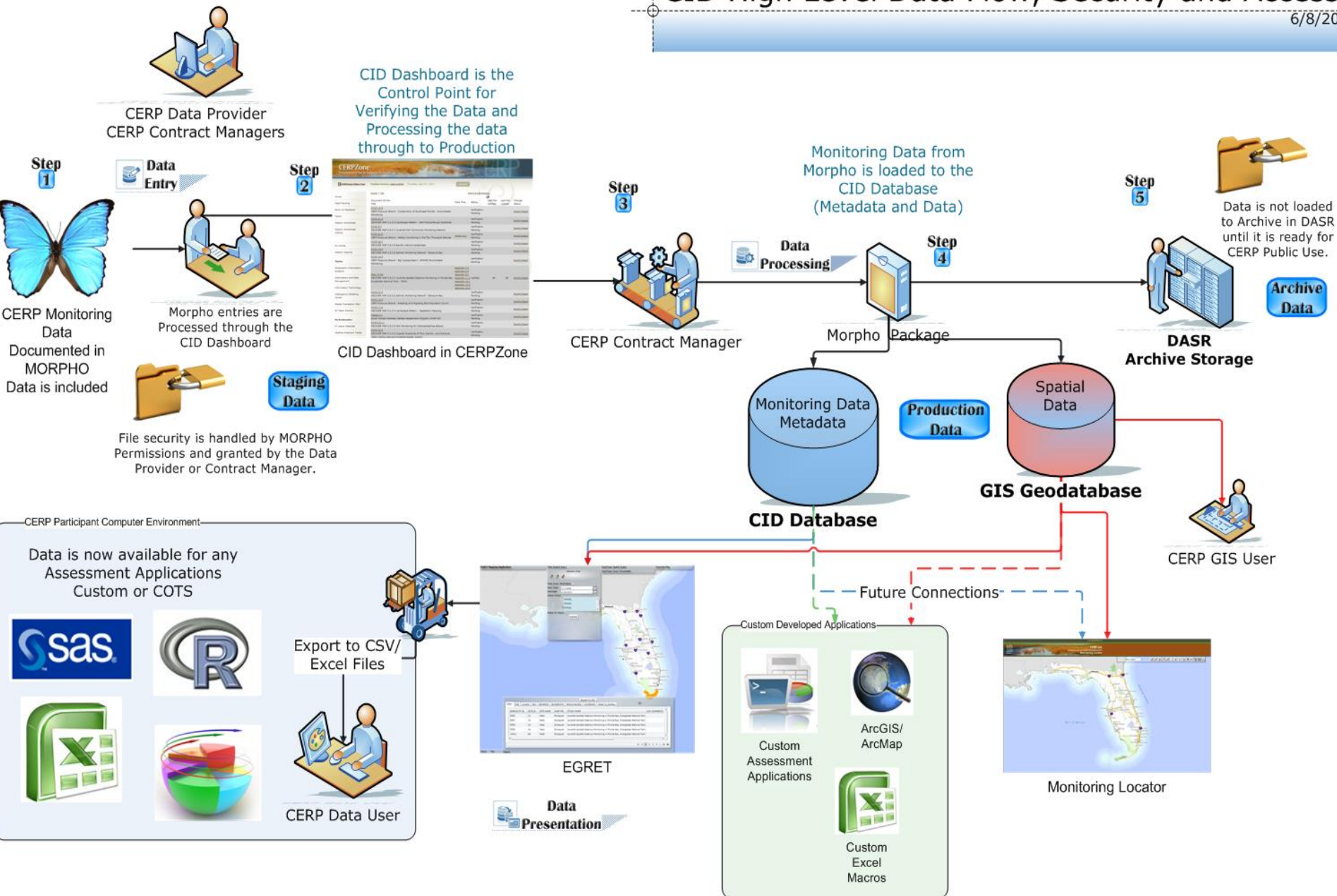
- Access to several types of data collected by multiple persons in one central location
- Ability to retrieve data using station names or a geographic interface
- Ability to retrieve data in a format that is importable to several different programs – from statistical programs to spreadsheets
- Ability to link together the water quality and hydrology database and the biological/ecological database
- Ability to link to custom applications



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CID High Level Data Flow, Security and Access

6/8/2011



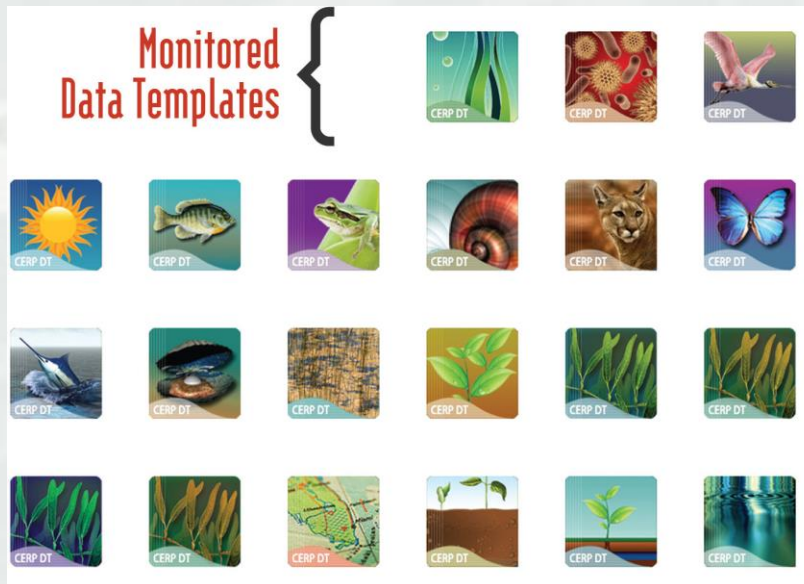


Proposed System



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- CERP Integrated Database (CID) and EverGlades Restoration Data Extraction Tool (EGRET)
- Connectable to other databases
- Data can be queried and extracted
- Allows storage of many types of biological/ecological data

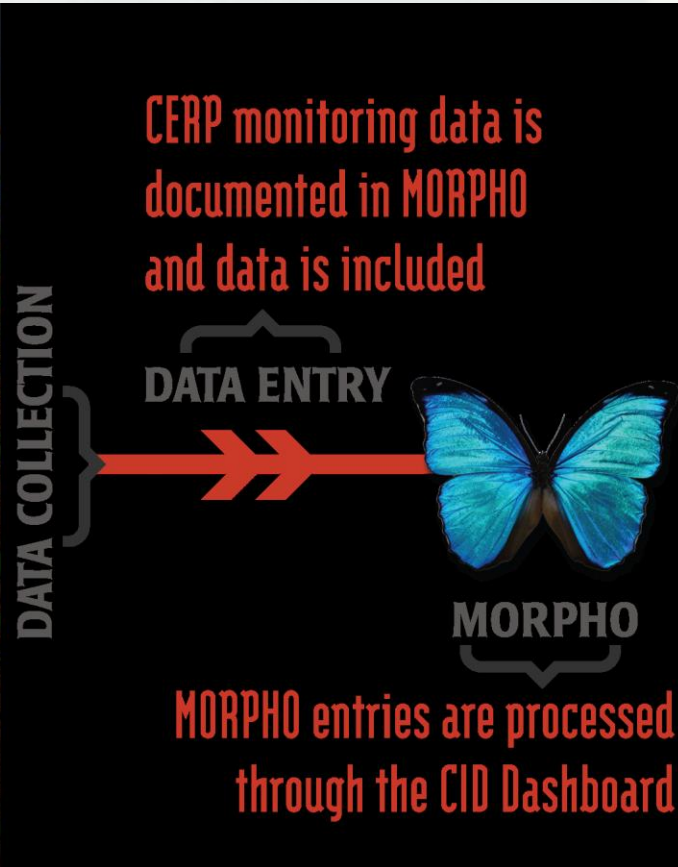




Step 1: Gather Data and Prepare for Data Entry



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- Utilizes an ecological metadata off-the-shelf product – Morpho – which is customizable
- Morpho can also accept the data files as attachments
- Templates are to be followed for each type of biological or ecological data
- Templates and tables can be added as new types of data are collected or identified
- Metadata and data files are all kept together in a single “package”



Step 2: Data Tracking



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- The CID Dashboard (DASH) is used to manage completed packages
- Provides version control of submissions resulting in “Chain of Custody” for the data (who changed what when)
- File and Package level security is available on all data loaded – restricting those that can change the data.
- Tracking and indexing of complete data inventory – finally know what all we have and where it is.

DASH
CERP Integrated Data Dashboard
is the control point for verifying and processing the data through to production

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Step 3: Data Verification



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The Contract Manager uses the Dashboard to review and promote the packages into the database

CERP CONTRACT MANAGER



DASH is used to review and promote completed packages into the Database

1. The Contract Manager reviews and verifies the deliverables based on the contract
2. The Contract / Data Manager accepts the package to load into CID

OR

3. The Contract/Data Manager sends the package back for corrections or changes



Step 4: Data Loading



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Monitoring data from MORPHO is loaded into the CID Database (metadata and data)

MORPHO PACKAGE



CID DATABASE



GIS GEODATABASE

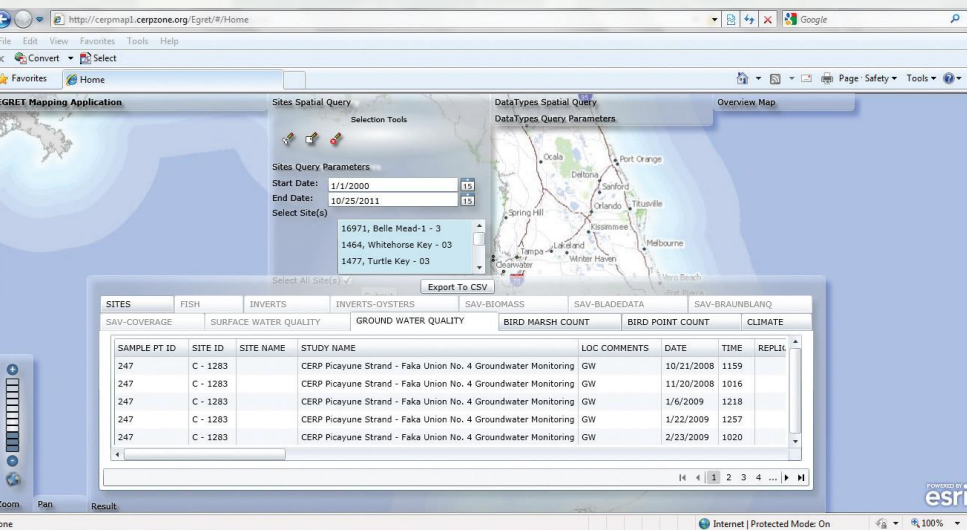
- The data is loaded into a relational database
- Location/Station information is geo-referenced
- Data is tied to other applications – for example, the Monitoring Locator application will receive the metadata information and location – thus automatically adding it to that application



Results: EverGlades Restoration Data Extraction Tool (EGRET)



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- EGRET is a geographic interface designed to facilitate the view of CERP monitoring locations as well as enabling access of associated data.
- EGRET allows for data query by spatial parameters or type of data.
- Monitoring component abstracts and data tables can be viewed within the application, or be exported to .csv files for further use.



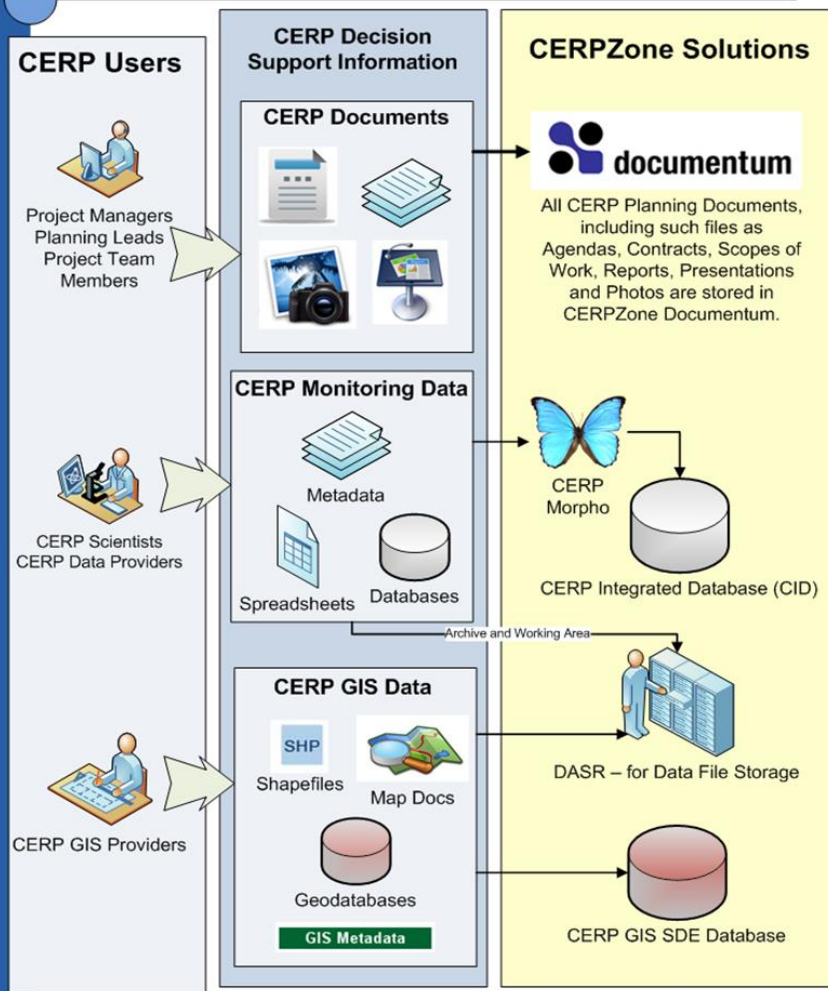
U.S. ARMY

Progress to date



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Storing Data in the CERPZone



- Metadata stored in MORPHO
- Data stored in DASR
- CID created
- EGRET created
- Partially populated

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Lessons Learned



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- Training PIs on using the system
- Automated uploading tools/templates
- Dedicated resources and staff
- Contract requirements for data uploading
- Linkage to other databases
- User education



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Questions

