

Large Scale Studies

Scoping, Development, and Implementation

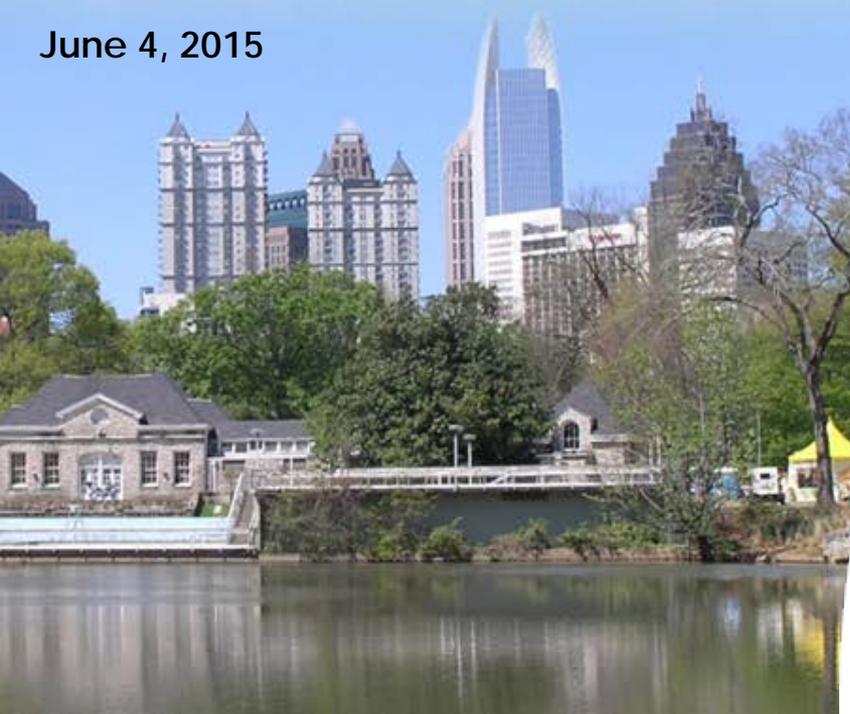
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Learning Objectives

- Discuss the differences between large-scale Feasibility, Watershed and Comprehensive studies.
- Describe how to develop a formulation and evaluation strategy.
- Recognize the interagency and national-level engagement required with large-scale studies
- Describe how comprehensive plans can fit in the USACE investment strategy



What is a large-scale study?

- Multiple projects combined into one study?
- Large watershed or region?
- Multiple project purposes?
- Significant complexity?
- All or a combination of the above?



Definitions

Watershed Assessment: Section 729 of WRDA of 1986 authorizes the Corps of Engineers to study the water needs of river basins and regions of the United States, in consultation with State, interstate and local governmental entities and results in a Watershed Plan.

Comprehensive or Basin-wide Study: Unlike watershed assessments, there is not a standing authority that authorizes comprehensive or basin-wide studies. The work that can be done under a comprehensive or basin-wide study will depend on the specific authority.

Feasibility Study: This is a study leading to either 1) a recommendation for authorization of improvements where there is no existing authorization or recommendation for authorization; or 2) a determination of a lack of Federal interest.



EC 11-2-208, 31 March 2015



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Watershed Study

- **Study Authority:** Sec 729, WRDA 1986 (unless specific watershed study authority is provided by Congress)
- **Implementation Authority:** None
- **Mission Areas:** Can formulate for all business lines (FRM, NAV, ECO, CSDR, WS, WQ, Watershed Protection, Drought Preparedness, Cultural Resources)
- **Collaboration:** Extensive collaboration with government at all levels, including federal family & Tribes
- **Recommendations:** Strategies or conceptual plans for USACE and other agencies that often require further study
- **Report/Product:** Watershed Management Plan or Director's Report; sometimes models or tools
- **Process:** SMART Watershed Planning

Watershed
Scale

Comprehensive Study

- **Study Authority:** Study authority unique, specific to region or basin
- **Implementation Authority:** As authorized by Congress
- **Mission Areas:** Can formulate for all business lines
- **Collaboration:** Extensive collaboration with government at all levels, including federal family & Tribes; often requires consistency with state & local plans.
- **Recommendations:** Depending on authority, can include: USACE investment strategy; future feasibility studies; future watershed studies; CAP projects; USACE projects for construction; strategies for other agencies; AND/OR modifications to existing USACE project(s)
- **Report/Product:** Comprehensive Plan
- **Process:** SMART Watershed Planning OR SMART Planning, 3x3x3

Regional
Scale

Feasibility Study

- **Study Authority:** Study authority unique, specific to watershed, river, or specific project location
- **Implementation Authority:** As authorized by Congress
- **Mission Areas:** Formulate for **high priority** business lines only (FRM, NAV, ECO, CSDR). Other mission areas = incidental benefits
- **Collaboration:** Collaboration limited to stakeholders and decision makers affected by project at specific location.
- **Recommendations:** USACE projects for construction
- **Report/Product:** Chief's Report or Director's Report
- **Process:** SMART Planning, 3x3x3

Project
Scale

Essential Areas for Vertical Alignment



Questions to Ask Before Scoping a Comp Study

- What does your authorization say? **Follow your Implementation Guidance.**
- Timeframe and cost may or may not be specified---Does it need to be 3x3x3 compliant?
- Study purposes---can USACE implement the projects?
- Feasibility, Watershed, or both?
- Are follow-on feasibility studies authorized?
- What is the endpoint? Chief's Report? Watershed Plan?
- Who are your partners? Single or multiple? NGO?
- Where is the significant Risk and Uncertainty in the study?



Authorizations



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North Atlantic Coastal Comprehensive Study

*... the Secretary shall conduct a comprehensive study to **address** the flood risks of vulnerable coastal populations in areas that were affected by Hurricane Sandy within the boundaries of the North Atlantic Division of the Corps...*



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Comprehensive Everglades Restoration Plan (CERP)

*...the Plan is approved as a **framework** for modifications and operational changes to the Central and Southern Florida Project that are needed to restore, preserve, and protect the South Florida ecosystem while providing for other water-related needs of the region, including water supply and flood protection...*



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Texas Coastal

...The Secretary shall develop a comprehensive plan **to determine the feasibility** of carrying out projects for flood damage reduction, hurricane and storm damage reduction, and ecosystem restoration in the coastal areas of the State of Texas...



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Charrette

- **A charrette is necessary & invaluable for scoping large scale studies:**
 - Achieve vertical alignment at the beginning of the study.
 - Bring stakeholders on board and find out local knowledge, concerns or reservations.
 - Identify existing data and studies that have been conducted.
- **Discuss the collaboration and public coordination strategy:**
 - What can the stakeholders and resource agencies contribute?
 - How will the public be engaged?
- **Develop a formulation strategy:**
 - Determine how trade-offs will be analyzed
 - Probably the most important product of the charrette for large-scale studies.



Collaboration

- Large-scale projects require significant interagency and national-level engagement.
 - PL 113-2: “ ...that the Secretary shall conduct the study in coordination with other Federal agencies, and State, local, and Tribal officials to ensure consistency with other plans to be developed, as appropriate...”
- Find out capabilities and contributions:
 - Technical capabilities?
 - ✓ Data/background information
 - Outreach assistance?
 - ✓ Aligning stakeholders



Collaboration

- A **comprehensive communication strategy** should be developed early on to integrate information across a broad spectrum of stakeholders and the public:
 - Many Comp study authorities specify collaboration at the local, state and Federal level.
 - Most people and/or groups want to be heard even though we may not recommend a certain plan.
- Do not wait until you have a plan to find out opinions and positions -- it can cause significant delays.

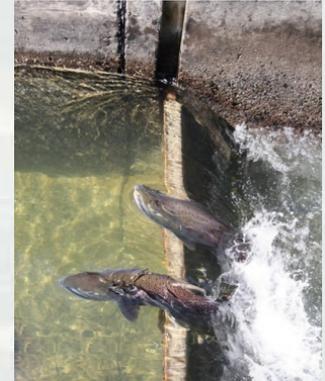


Plan Formulation

- Whether you're doing large-scale feasibility, watershed or comp study, you have a lot more to do in the same amount of time or even less.
- Always consider how you will evaluate and compare alternatives when you begin formulation -- if you can't separate them, they're no good.
 - This should be on your mind from the outset when you begin with a charrette.
- Develop a diagram that can guide the team, and eventually, reviewers through your strategy.
 - Refine it along the way.
 - This will be your go-to for PDT meetings, public coordination, etc.



Plan Formulation



- Do not reinvent the wheel.
 - For large-scale studies, there are almost always existing studies that you can borrow from.
 - For FRM, there's a good bet someone has looked at it – FEMA, USGS, states and localities.
 - For AER, use existing Conceptual Ecological Models --- new science is time consuming.
 - Pick species or attributes that have been studied and represent the system.
 - Using Endangered Species is typically a poor idea.
 - Controversial – invites issues for stakeholders/interested public.
 - Your alternatives could show detriment due to lack of sufficient data – eliminates possibility of a trade-off.



Formulation Strategy

- A formulation strategy determines how you will combine management measures into alternative plans.
 - There are usually just too many options for a large-scale study, your formulation will need direction.
 - Document!
 - Don't forget to bracket.
- Strategy Examples:
 - Group/organize/separate the study dependencies (e.g. flood control structures that work together along a tributary).
 - Follow the water --- increasing water in one area may lead to greater flows in others.
 - Similar ecosystems or attributes
 - By region, state or locality.



Evaluation Strategy

- An evaluation strategy is necessary to take you through complex alternatives.
 - Allows you to break your plan evaluation into manageable steps.
 - Provides breakpoints to review results and ensure the process is working.
 - Allows you to periodically take results to partners/public for collaboration.
 - You should present at least a basic Evaluation Strategy at the Alternatives Milestone (or similar time for non-feasibility studies) -- it will be refined as you move through your analysis.
- Use a tiered, iterative approach for multiple levels of screening/evaluation.



NACCS Coastal Storm Risk Management Framework

- **Tier 1 - Screening level regional evaluation**
 - Establish reaches based on regional boundaries, geomorphic features, etc.
 - Evaluate broad factors such as population and supporting infrastructure, impacts from climate change and environmental/cultural resources.
- **Tier 2 – Refine the analysis at a state or watershed level**
 - Incorporate existing CSRMs projects and other planned activities
 - Compare different strategies: Avoid/Accommodate/Preserve
 - Cost comparison index using parametric costs
- **Tier 3 - Site-specific, local scale analyses**
 - Consider combinations of measures for alternative comparison
 - Benefit-cost analyses
 - Examine risk, vulnerability, exposure, including sensitivity and adaptive capacity
 - Resilience/sustainability and recovery of critical infrastructure



Evaluation Strategy

- Models are great if you can actually use them.
 - Your job is to separate alternatives based on merit.
 - Essential criteria can be used to screen before benefit analysis (induced flooding, O&M requirements, etc.).
 - Avoid models with massive data requirements or those with a massive academia focus.
 - Expand or build on existing flood models --- Has FEMA, state or locality done a prior study? Existing USGS stations?
 - Consult with the appropriate Center of Expertise at the charrette, and later BEFORE you proceed with model development.
- In some cases, your plan formulation and evaluation may be linked together, in that you are continually screening and optimizing alternatives until you reach a final, or focused array.

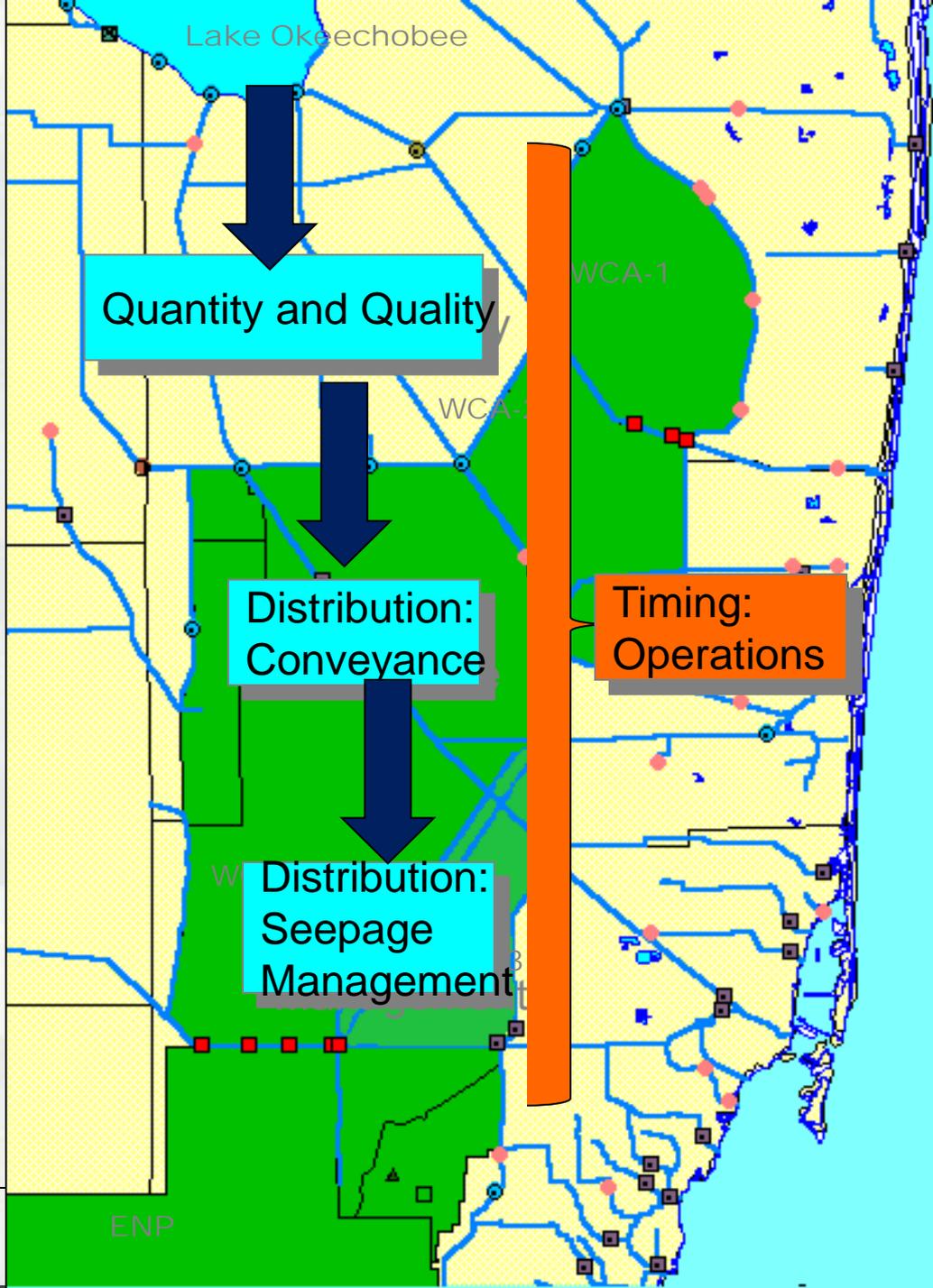
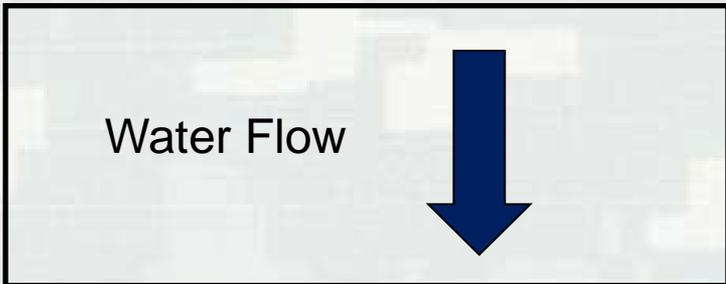


BE INNOVATIVE!



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- The CEPP Plan Formulation strategy consisted of a 3-part, sequential process that followed the natural path of water through the Everglades system and highlights the interdependent nature of the project components.



CEPP PLAN FORMULATION FRAMEWORK



TREATMENT / STORAGE

CONVEYANCE/DISTRIBUTION/SEEPAGE

INITIAL SCREENING

RANGE OF SIZES

SCREEN AND OPTIMIZE
(RESOPS, Eco-criteria, Cost)

Option A

Option B

WATER BUDGET

COMBINE OPTION A AND OPTION B
WITH CONVEYANCE, DISTRIBUTION
AND SEEPAGE MEASURES

NOTE: Potentially
large number of
combinations

SCREEN AND OPTIMIZE
(RSM, Parametric Costs, Eco-Criteria)

A1 A3 A7 B2 B3 B6

Final Array of
Alternatives

DETAILED EVALUATION

(Ecological benefits, Planning-level Costs,
CE/ICA, P&G criteria, System of Accounts)

TSP

Level of Detail

- Driven by the end product
 - Examine existing resources – we are limited in how much information gathering work we can do.
 - **Determine what is the minimal amount of information necessary to make an informed decision** – you only need to separate the alternatives.
 - Use the vertical team:
 - Ask about other studies – Your RIT can put you in touch with other MSCs/Districts
 - OWPR is a tremendous resource.



After the plan....

- How do you implement?
- How do you budget?
- How do you handle changes?
- How do you maintain commitment?



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Large Studies: Implementation Planning

- Implementation plans can be as controversial as the plans themselves
 - ▶ Sequencing
 - ▶ Long construction durations
 - ▶ Large costs over time
 - ▶ Contingencies and changed conditions
 - ▶ Sponsor & Stakeholder commitment
 - ▶ All levels of Government have a role



Budget Development

- Coordinated plan can help inform the budget
 - ▶ Shows ***National*** significance
 - ▶ Shows how component parts fit together
 - ▶ Can help define appropriate increments
- Watershed Informed Budgeting



Budget Issues

- Pay attention to annual Budget EC
 - ▶ PED rules
 - ▶ New Start policy
- Incremental Funding
 - ▶ Acquisition strategy impacts



- *Get to know your Programmers!*



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Managing Changes

- COST

- ▶ Cost control board
- ▶ Section 902
- ▶ Scope Changes



- Design & Real Estate

- ▶ Chief's discretionary authority vs. new plan?
- ▶ *Planners must stay involved*



Stakeholder Commitment

- Sponsor commitment & funding is critical
 - ▶ ***Sponsor Funding = Commitment***
 - ▶ USACE can't work without a sponsor
- Maintain coalitions
 - ▶ Sponsors have major role in this



Questions or Comments?



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