Plan for Coordinating Science

Phase II

Science Coordination Group Meeting

August 31, 2005

Plan for Coordinating Science

- **Built System Indicators**
- **Science Needs, Gaps, and Actions**
- **Information Sharing**
- **Tracking Progress**
- **Quality Assurance**

Built System Indicators Subgroup Members

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Built System Indicators Briefing

- Background
- Initial Built System Indicators
- Next Steps

The SCG directed the Subgroup to develop built system indicators in response to Task Force Goal 3:

Foster Compatibility of the Built and Natural Systems.

- Subgoal 3-A: Use and manage land in a manner compatible with ecosystem restoration
- Subgoal 3-B: Maintain or improve flood protection in a manner compatible with ecosystem restoration
- Subgoal 3-C: Provide sufficient water resources for built and natural systems.

The Built Systems Subgroup held two teleconferences to develop a draft set of indicators

9 August

Subgroup Teleconference

- Review Task Force Goal 3
- Review existing indicators developed in other programs
- Identify potential built system indicators from list of 27 for further discussion and review
- Agree on template for indicators based on 9 guiding questions

24 August

Subgroup Teleconference

- Further discuss and refine potential indicators into set of initial “strawman” indicators for presentation to 31 August SCG meeting

The Built Systems Subgroup seeks SCG review and guidance on "strawman" built system indicators

31 August

SCG Meeting

- Review and discuss initial strawman indicators
- Provide input and guidance to Built System Indicator Subgroup for next steps in developing built system indicators

The Subgroup reviewed other restoration programs that have established built system indicators and can offer lessons learned, or provide helpful information

- RECOVER
- Southwest Florida Feasibility Study
- CSOP (MODWATERS and C-111 Projects)
- CALFED Bay-Delta Program
- Chesapeake Bay Program

Selected Built System Indicators developed by other programs

Indicator	Source
Water Volume	RECOVER
Water Quality / Saltwater Intrusion	RECOVER
Flood Control	RECOVER
Other Socioeconomic Indicators	RECOVER
Drinking Water Quality	CALFED
Water Supply Reliability	CALFED
Levees Program: Acres Flooded	CALFED
Water Volume: Quantity and Distribution	SWFFS
Population Growth/Development/Land Use	SWFFS
Aquifer Water Levels	SWFFS
Number of Water Control Structures	SWFFS
Acres of Land that Hold Water During Wet Season	SWFFS
Boat Landings	SWFFS
Vegetation Cover	SWFFS

Indicator	Source
Land Use Conversion	SWFFS
Impervious Surface Extent	SWFFS
Change in Acreage of Habitat	SWFFS
Agricultural Land Using Conservation Methods	SWFFS
Acres Under Land/Habitat Management	SWFFS
Acres Under Fire Management	SWFFS
Acres Under Safe Harbor Agreement	SWFFS
Beach Closures	SWFFS
Irrigation Demand Met with Reuse Water	SWFFS
Per Capita Water Use	SWFFS
Tourism / Hotel Vacancy Rates	SWFFS
Acres of Preserved Lands	Chesapeake Bay
Changes in Growth in Vehicle Miles of Travel (VMT) v Population	Chesapeake Bay

Subgroup identified four (4) initial built system indicators

- Water Volume: The relationship between new freshwater captured and how it is distributed among the built and natural systems
- Saltwater Intrusion
- Per Capita Use of Water
- Wastewater Reuse

Initial Indicator

- Indicator 1: Water Volume: the relationship between *new* freshwater captured and how it is distributed among the built and natural systems
  - Adapted from the RECOVER interim target
  - This indicator measures the supply of *new* freshwater captured for potential distribution and compares it to freshwater demand from both the built and natural systems.
  - The amount of *new* freshwater volume captured (acre feet) will be compared to demand, which is defined by policy decisions of how water is allocated among the built and natural systems.
    - The key driver of built system demand is population growth.
  - The collective determination of how much *new* freshwater is captured over time and how it is allocated among the built and natural systems will indicate compatibility. For compatibility to be achieved:
    - The amount of *new* freshwater captured must meet stated targets.
    - *New* freshwater captured must be distributed appropriately among the built and natural systems.
  - RECOVER's interim targets for *new* water captured are 1,084,000 acre-feet in 2010 and 1,871,000 acre-feet by the end of CERP implementation, or 2050.

Initial Indicator

- Indicator 2: Saltwater Intrusion
  - Adapted from the RECOVER interim targets that protect coastal aquifers from saltwater intrusion
  - This indicator measures the salt intrusion line or salinity levels in coastal aquifers.
  - There is a system of monitoring chloride levels in coastal aquifers and the Subgroup is assessing whether this measurement is suitable for this indicator.
  - If no measure of salinity is deemed suitable, the Subgroup may also consider canal water levels maintained by SFWMD as a “surrogate” indicator for coastal aquifer salinity levels. If canal water levels decrease despite SFWMD’s efforts to maintain appropriate levels, this would indicate increased likelihood of saltwater intrusion in coastal aquifers, suggesting increased incompatibility.
  - Regardless of the system of measurement selected by the Subgroup for this indicator, increased salinity would indicate increased incompatibility while decreased salinity would indicate increased compatibility. No change in salinity levels would indicate no change in current compatibility.

Initial Indicator

- Indicator 3: Per Capita Use of Water
  - Adapted from the Southwest Florida Feasibility Study (SWFFS).
  - This indicator measures freshwater supply in the context of its demand by the built system. It measures the amount of total freshwater used and normalizes that amount by the population to derive a consistently measurable indicator expressed in terms of "per capita."
  - Increases in per capita water use would indicate increased incompatibility because the amount of freshwater used in the built system would be increasing at a faster rate than the population. Decreases in per capita water use would indicate increases in compatibility, suggesting successful water conservation and other freshwater demand management approaches.

Initial Indicator

- Indicator 4: Wastewater Reuse
  - This indicator resulted from Subgroup discussion.
  - It focuses on the concept that reuse of wastewater before it is discharged back to sea or lost from the system through deep injection wells mitigates demand for *new* freshwater and therefore indicates increased compatibility.
  - The Subgroup is considering different options on how to best describe this indicator. Options discussed so far include:
    - **Land area with access to reused (reclaimed) wastewater**
    - **Per capita use of reused (reclaimed) wastewater**
    - **Percent water supply reused (reclaimed) wastewater**
    - **Volume increase in reused (reclaimed) wastewater**

The Subgroup is considering additional built system indicators that have inherent challenges to overcome

- Aquifer Water Levels and Flood Protection
  - Groundwater levels and canal stages are important measures of flood protection level of service and also wellfield recharge. They are likely to be affected by conveyance and seepage management projects that are part of restoration, and also by development practices in the built environment.
  - Developing a single system-wide aquifer water level target is problematic because there are some areas where increased aquifer water levels are desirable (drought prone agricultural areas and wellfields) and others where it is not desirable (flood prone areas).
  - RECOVER is developing a water level measure that, when complete, may have useful application to the built system indicators.
  - Subgroup will continue evaluating appropriate system-wide aquifer level target.
- Change in Land Use
  - The Subgroup has not been able to reach consensus on developing a system-wide indicator for measuring changes in land use
  - Two concepts have been discussed, although consensus has not yet been achieved:
    - Measure conversion of agricultural, suburban and urban lands in defined areas
    - Measure changes in impervious surface by land use category
  - The Subgroup needs further discussion, including review of graphical materials that may help provide further understanding of spatial relationships, before it can agree on land use changes as an appropriate built system indicator.

Next Steps

- SCG review and comment on initial built system indicators
- Built System Indicators Subgroup address SCG comments and develop a revised set of built system indicators
  - Additional built system indicators may be developed by Subgroup
  - Subgroup to meet on September 16 to further define indicators
  - Additional Subgroup meetings, as necessary

Plan for Coordinating Science

- Built System Indicators
- Science Needs, Gaps, and Actions
- Information Sharing
- Tracking Progress
- Quality Assurance

Science Need

- Need
  - A process or phenomenon that must be rigorously understood to make sound ecosystem restoration decisions and support ecosystem restoration success

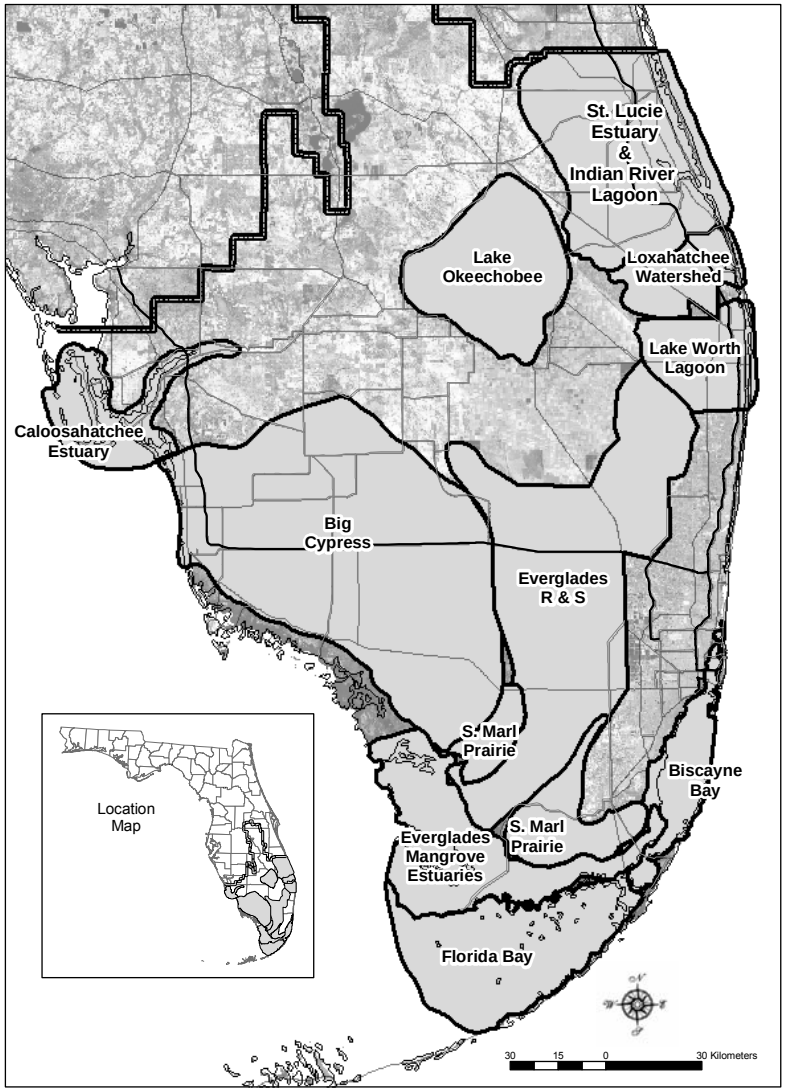
    - **Example:**
      - ✓ To understand and predict the effects of water management, restoration of Keys' tidal passes (i.e., Flagler's Railway [Keys' Fill]), local development, and agricultural practices on Florida Bay's:
        1. Salinity
        2. Water Quality (e.g., light, nutrient availability)
        3. Seagrass communities, associated nurseries (e.g., pink shrimp), and higher trophic functions (e.g., forage base for fish-eating birds)

Science Gap

- Gap
  - When there is not a full understanding of a process or phenomenon or an effort is not in place to achieve that understanding in a timely manner to address ecosystem restoration needs
    - **Examples:**
      - ✓ Fully implementing critical elements within the FBAMS Science Plan and its evaluation of current restoration plans and alternative plans (e.g., DON availability, mudbank evolution, and improved bathymetry)
      - ✓ Fully implementing and sustaining the CERP MAP for the Southern Estuaries. The USACE and the SFWMD fund part but not all of the CERP MAP. Task Force coordination and agency actions are required to fully implement and sustain RECOVER/MAP
      - ✓ Sustaining critical elements within the FBAMS Science Program and completion of the FB/FKFS water quality model in accordance with the Feasibility Study Project Schedule to provide timely recommendations to upstream CERP projects

Science Action

- Action
  - A step taken that is the most effective way to address a gap
    - **Example:**
      - ✓ Review FB/FKFS model progress, implementation of the CERP MAP for the Southern Estuaries, and the FBAMS Strategic Science Plan



Conceptual Ecological Models by CERP MAP Modules

Northern Estuaries

- Caloosahatchee Estuary
- Lake Worth Lagoon
- St. Lucie Estuary & Indian River Lagoon
- Loxahatchee Watershed

Southern Estuaries

- Biscayne Bay
- Everglades Mangrove Estuaries

Greater Everglades Wetlands

- Everglades Ridge and Slough
- Southern Marl Prairies
- Big Cypress Regional Ecosystem

Lake Okeechobee

Total System

Phase II Approach for Need, Gap, and Action Identification

- Identifying Needs
  - Major hypotheses clusters for CERP's Monitoring and Assessment Plan (MAP) Regional Modules were reviewed by CEM sub-teams to identify critical science needs for the remaining South Florida CEMs
- Identifying Gaps
  - Each CEM sub-team evaluated their science initiatives with respect to each identified need to ascertain any gaps in scientific understanding for their region.
- Identifying Coordinating Actions
  - Each CEM sub-team determined actions that they considered the most effective way to fill the gaps identified for their MAP Module.

Progress on Needs, Gaps, and Actions Identification

- Two Day Workshop Held on August 16 and 17
  - Draft science needs with associated gaps and actions were identified for three MAP Modules:

Module	Needs	Gaps	Actions
Northern Estuaries*	10	21	12
Southern Estuaries	4	13	3
Greater Everglades	9	13	9

***Additional needs, gaps, and actions are being explored by the N. Estuaries sub-team**

  - Because of the overlapping nature of some needs identified (e.g., multiple hydrological or water quality needs for a region), needs are being reviewed for consolidation into major overarching needs for each Module

Consolidation of Science Needs

- Example of Needs Identified for the Northern Estuaries
  - To understand and evaluate the spatial extent of submerged aquatic vegetation (SAV) in the Northern Estuaries (NE)
  - To understand and predict the extent of SAV beds as related to suitable substrate (assessment of both suitable and non-suitable substrate for SAV)
  - To understand and predict the relationship between fish populations (fauna) and bottom types (i.e., sediment types, vegetation, oysters, etc.) in the NE
  - To understand and predict how changes in oyster reefs affect the associated floral and faunal communities inhabiting and surrounding them

- Consolidated Need
  - To understand and characterize the spatial distribution, conditions, and ecological relationships among Northern Estuaries:
    - submerged substrates
    - SAV
    - associated benthos
    - oysters
    - fish

Consolidation of Science Needs

- Example of Needs Identified for the Northern Estuaries
  - To understand and predict the effects of hydrologic conditions and sea-level rise on water quality and salinity as it relates to submerged aquatic vegetation (SAV) distribution and abundance in the Northern Estuaries (NE)
  - To understand and predict how changes in SAV community structure and function caused by shifts in water quality and salinity affect associated flora and fauna (i.e., fish and invertebrates) that reside in SAV in the NE
  - To understand and how oyster reef abundance and health responds to changes in water quality and salinity as a result of habitat restoration activities in the NE
  - To develop a continuous monitoring plan for water quality and salinity to understand relationships to benthic community health in the NE
- Consolidated Need
  - To understand and predict how change in water quality and salinity affect the relationships between Northern Estuaries:
    - SAV
    - oysters
    - fish
    - associated benthos

Progress on Needs, Gaps, and Actions Identification

- Two Day Workshop Scheduled for September 14 and 15
  - Identify specific science needs, gaps, and actions for Lake Okeechobee
  - Review and update Phase I needs, gaps, and actions developed for Total System CEM
  - Review ongoing need consolidation process
- Goal
  - Needs, gaps, and actions drafted for review at SCG November meeting

Plan for Coordinating Science

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The Information Sharing subgroup recommends that the SCG adopt a collective statement on Information Sharing

- On August 9, the Information Sharing Subgroup reviewed examples of information sharing agreements used to guide other scientific research/restoration programs within the context of the SFERTF information sharing needs, gaps, and actions
- The Subgroup agreed that the SCG should adopt an information sharing policy agreement similar to that of the National Institutes of Health:
  - *"Data should be made as widely and freely available as possible while safeguarding the privacy of participants, and protecting confidential and proprietary data"*
- Other Data / Information Sharing Examples
  - National Institutes of Health: http://grants.nih.gov/grants/policy/data_sharing/
  - San Francisco Bay – Delta Science Consortium: http://bdat.ca.gov/
  - U.S. Forest Service: http://www.fs.fed.us/gac/metadata/policy.html
  - U.S. Fish & Wildlife Service: http://www.fws.gov/data/fwsdata.html

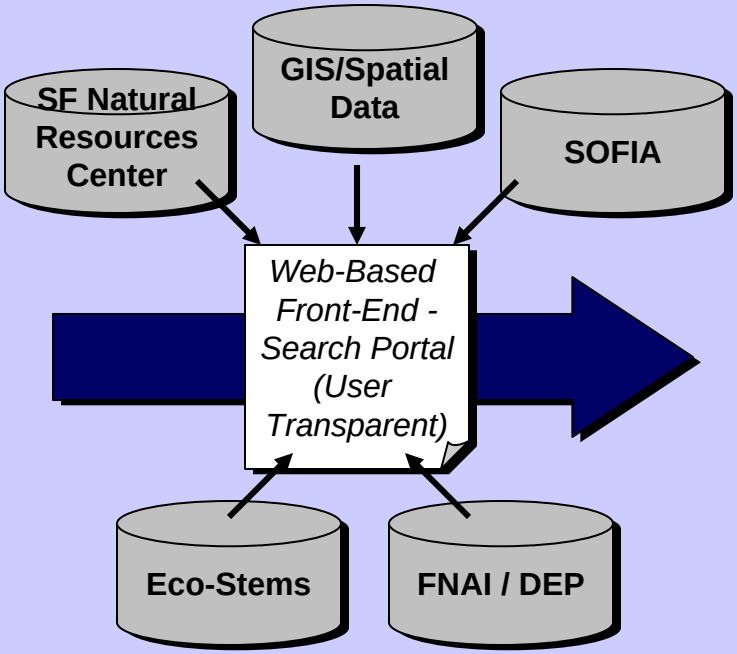
INFORMATION SHARING

Effectively accessing and sharing information across multiple databases and systems will facilitate better scientific coordination

Information Sharing Diagram

Possible Information Components

- Project Information
  - Title and Abstract
  - PI Name and Contact Info
  - Amount of Funding / Duration
- Final Project Reports
- Publication / Research Products
- Summarized/Reported Data
- SFERTF Calendar Input
  - Conferences
  - Symposia
  - Workshops
  - Other Related SF Restoration Projects
- Special Reports
- Management Information / Analysis
- Agency Reports and Plans
- Other Restoration Programs in SF



Possible Outputs

- Monthly/Quarterly SCG Newsletter
- SCG Calendar
- PI / Project Info
- Ad-Hoc Reports
- Bi-Annual TF Report
- Five-Year Report to Congress
- SF Environmental Report (SFWMD)

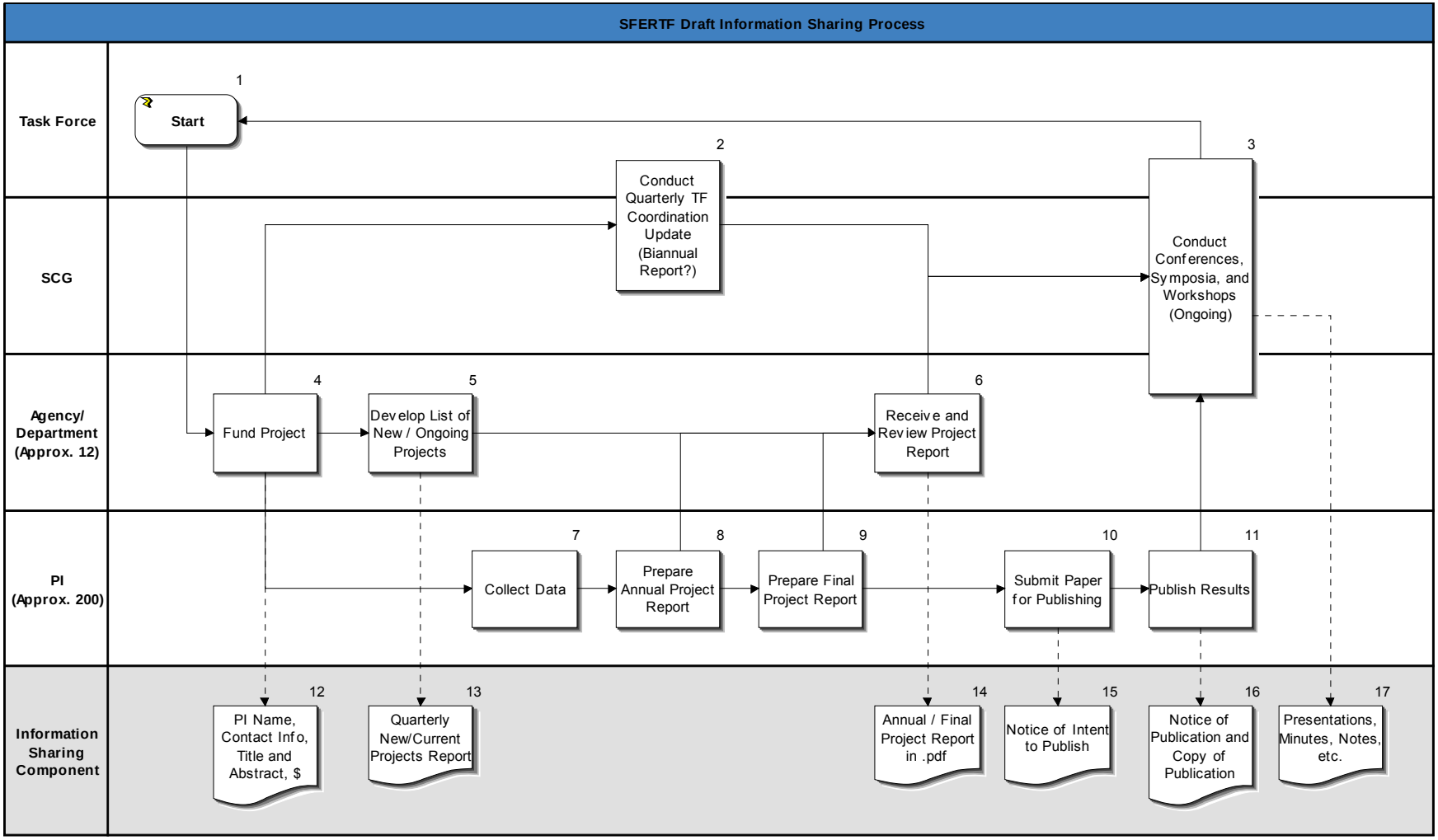
Effective information sharing should address a number of key information components

Information Sharing Considerations

Information Component	Description	Responsible Party	Benefit	IT Implication
Project Information	Project title, abstract, PI name and contact info, amount and duration of funding, etc.	PI, Funding Agency	Facilitates information sharing; limits overlap of future research	Interactive, web-based front-end with search capabilities; accessible by multiple users
Final Project Reports	Summary of completed research submitted to awarding agency	PI, Funding Agency	Provides research conclusions to influence ongoing and future projects	Interactive, web-based front-end with search capabilities; accessible by multiple users
Publication Information	Title, PI, Name of publisher, copy of article	PI	Provides research conclusions to influence ongoing and future projects	Interactive, web-based front-end with search capabilities; accessible by multiple users
Summarized/ Reported Data	Scientific data that has been reported, summarized, or manipulated, and is available for release	Individual Agencies	Facilitates information sharing; limits overlap of future research; Provides research conclusions to influence ongoing and future projects	Interactive, web-based front-end with search capabilities; accessible by multiple users
SFERTF Calendar Information	Upcoming meetings, events, symposia, workshops, etc.	SCG	Promotes collaboration and participation in cross-agency and cross-disciplinary efforts	Group calendar functionality, communication mechanism
Special Reports	Scientific management reports created to address specific gaps in research	SCG, TF, Individual Agencies	Detailed analysis and research synthesis to influence ongoing and future projects	Weblinks to reports
Conferences / Symposia	Periodic meetings to discuss research and project related to the overall restoration effort	SCG, TF, Individual Agencies	Detailed, focused information sharing venues to promote collaboration	Repository for minutes, presentations, notes, etc.
Newsletters	Periodic document (monthly, quarterly) to distribute key information	Task Force	Provides stakeholders with timely updates on progress and new information related to the restoration	Email, webpage

INFORMATION SHARING

Key information components should be generated and disseminated at designated points



Note: Timeframes are relative for each swimlane

Additional Information Sharing Needs, Gaps, and Actions

- Information Sharing Needs
  - Agreement and system are needed to share science information to better coordinate and integrate South Florida restoration science
- Information Sharing Gaps
  - No consensus or agreement exists regarding information sharing or what kinds or levels of restoration science information to share among agencies
  - No user transparent, interactive, and consistent method exists for sharing restoration-wide science information (see gap and action number 1)
  - Individual agencies may not have data sharing and management policies to support their science programs or in support of restoration needs
- Information Sharing Actions
  - Establish agreement among the Task Force agencies regarding information sharing, identify methods, user systems, and kinds and levels of science information to share among all users
  - After evaluating existing agency specific information sharing systems, develop a consistent, interactive, user-transparent system to share Task Force agency member's information on restoration science among all restoration partners
  - Recommend that Task Force agencies with existing information/data management policies review those policies in light of restoration needs and programs and where appropriate revise data management policies to reflect restoration needs and initiatives
  - Recommend that Task Force agencies without information sharing policies and procedures develop policies consistent with the principles established in the Task Force information sharing agreement to assist in managing the information generated as part of restoration science programs

Additional Information Sharing Needs, Gaps, and Actions (cont.)

- Information Sharing Needs
  - Periodic science meetings and forums including, conferences, symposia, workshops, etc. to exchange and review collective scientific research, monitoring, modeling and studies as a body of work
- Information Sharing Gaps
  - None noted
- Information Sharing Actions
  - None Required

Additional Information Sharing Needs, Gaps, and Actions (cont.)

- Information Sharing Needs
  - A means for researchers/scientists (research grade scientists) to receive credit for time and effort dedicated to sharing information (meetings, reports, comments and reviews, etc.) with other researchers/scientists or managers or policy makers, other than through publishing/peer reviewed journals
- Information Sharing Gaps
  - Research-grade evaluation system does not provide incentives for information sharing
- Information Sharing Actions
  - Modify research-grade evaluation system to provide incentives for information sharing, particularly for large restoration projects

Plan for Coordinating Science

- Built System Indicators
- Science Needs, Gaps, and Actions
- Information Sharing
- Tracking Progress
- Quality Assurance

Review of PCS Needs, Gaps, and Actions for Tracking Progress

- Needs
  - Track progress to ensure that gaps are being addressed in a timely manner and status is being reported to the Task Force
  - Periodically review science needs and gaps, review the method for identifying needs and gaps to incorporate improvements, and update the Plan for Coordinating Science to incorporate lessons learned and indicate the progress of filling gaps
- Gaps and Actions
  - Develop processes for tracking the progress of filling gaps
  - Develop processes for periodically reviewing science needs and gaps, reviewing the method for identifying needs and gaps to incorporate improvements, and updating the Plan

What Products are Needed for Tracking the Progress of Filling Gaps?

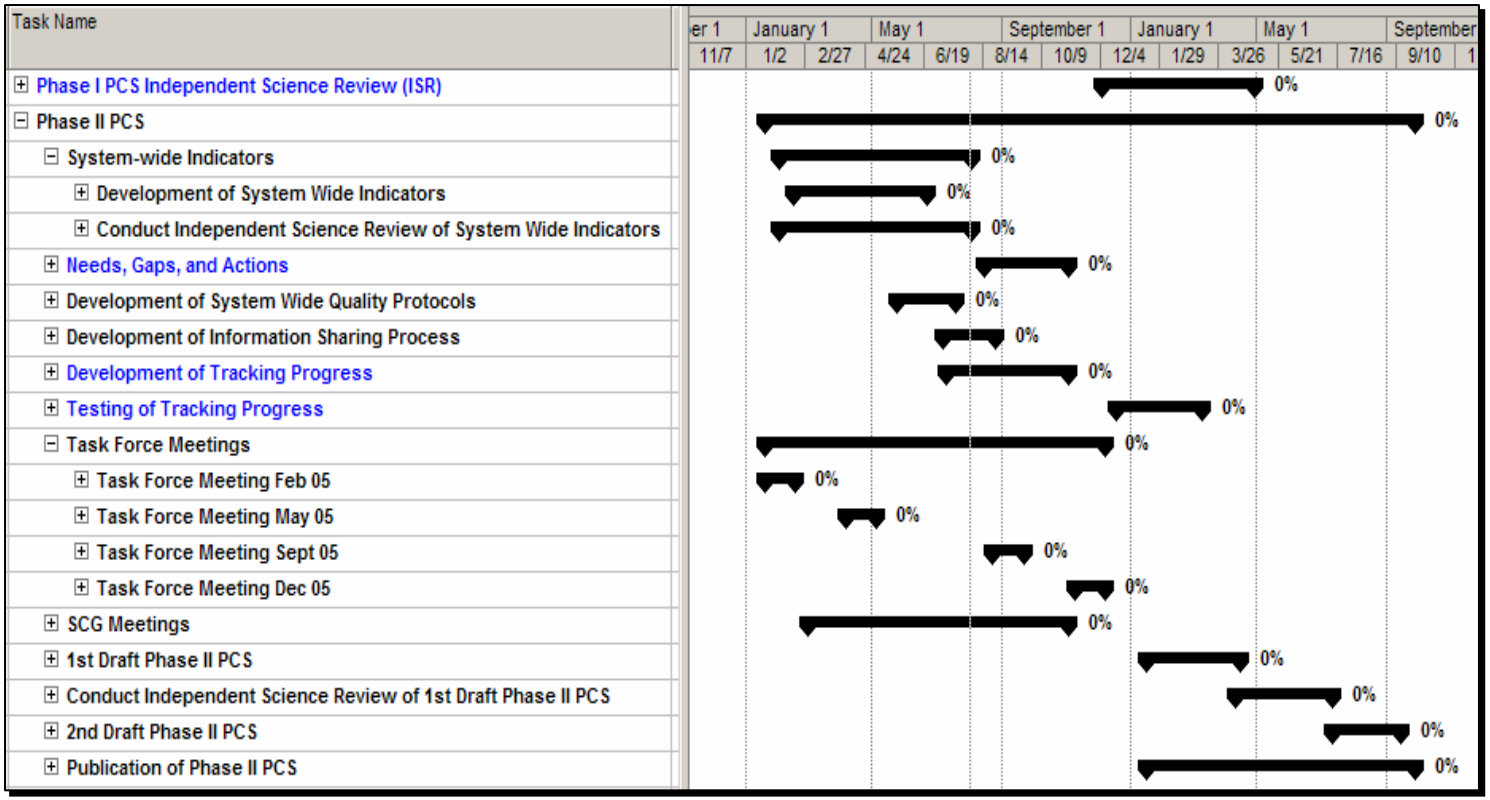
Systems for Tracking the Progress of Filling Gaps

- Purpose - **Ensure timely completion of actions to fill gaps by:**
  - Identifying who is responsible for filling each gap
  - Monitoring the progress of action completion to support briefings to the Task Force
- Products - **What type of tracking products are required by the SCG to meet this purpose?**
  - Basic tracking tool for tracking the responsibility and status of filling gaps?
  - Detailed tracking tool to collect more precise information required to prepare periodic briefings to the Task Force?
  - Interactive tracking tool that is accessible to all agencies and used to collect detailed information for preparation of periodic briefings to the Task Force?

Potential Products for Tracking the Progress of Filling Gaps

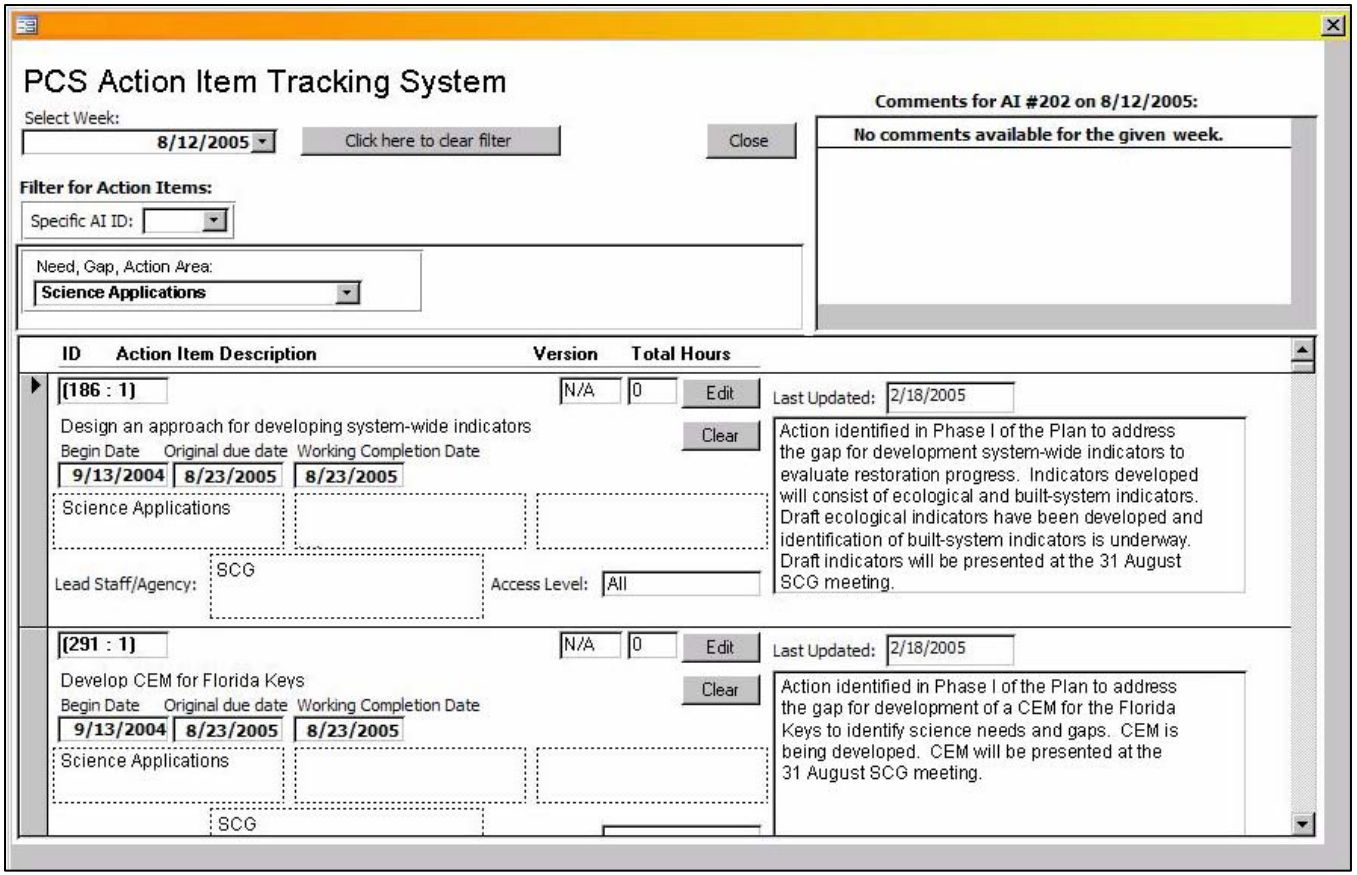
- Potential Products for Tracking Progress
  - Basic tracking tool – **MS Project schedule**
    - **Basic schedule developed to track the progress of actions to address gaps**
  - Detailed tracking tool - **Server-based database (MS Access database)**
    - **Database that contains detailed tracking information to facilitate preparation of periodic briefings to the Task Force and capable of producing automated reports**
  - Interactive tracking tool - **Web-based system**
    - **Internet system accessible to remote users (e.g., developed from and compatible with the project tracking system, http://www.ecostems.org)**
    - **Designed to contain detailed tracking information and to generate automated reports for tracking the progress of actions, preparing briefings to the Task Force, and information sharing**

Potential Products for Tracking the Progress of Filling Gaps



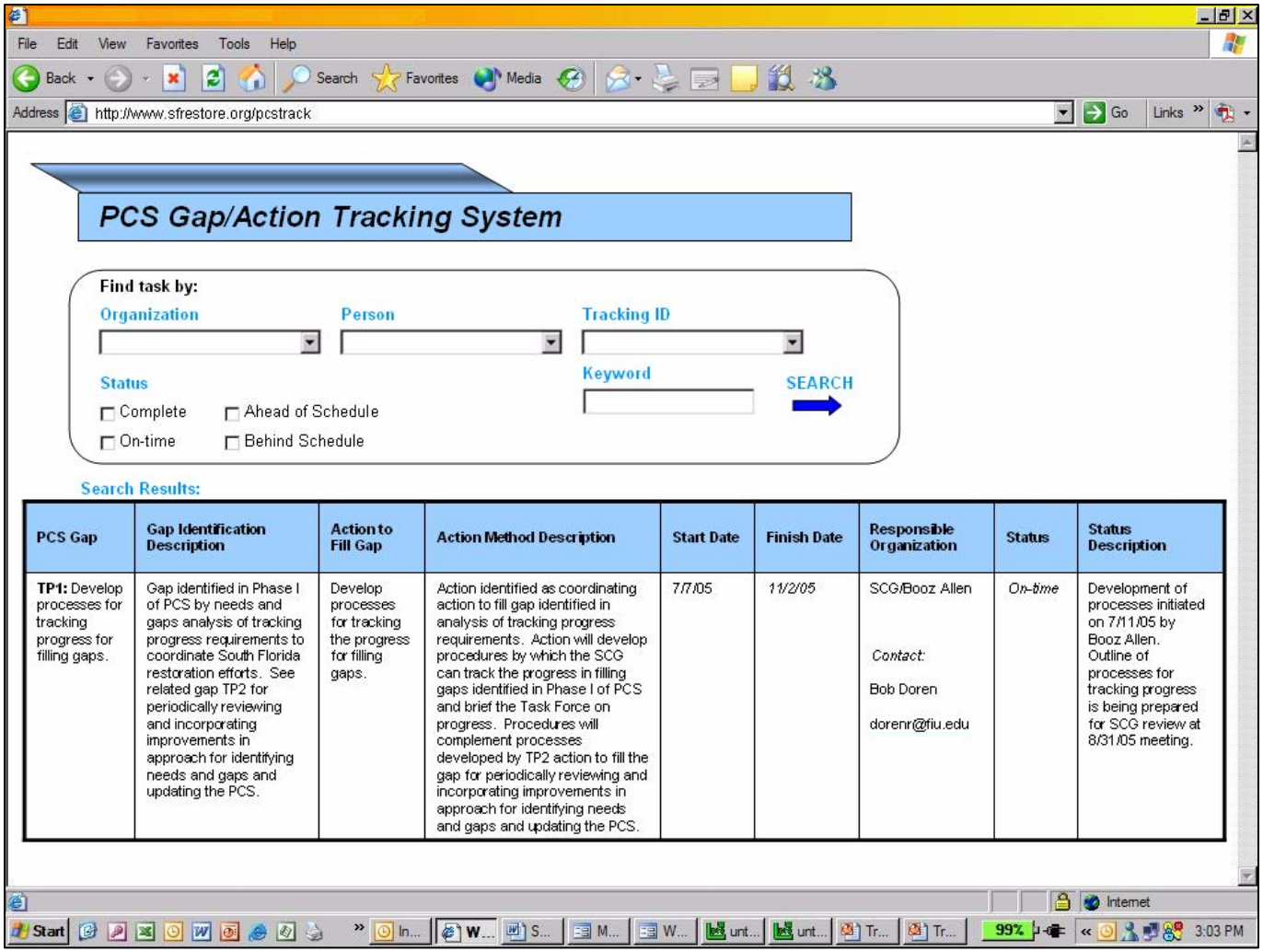
Basic MS Project Schedule
Tracks task name, working days, start date, finish date, minor notes, and responsible organization for the action

Potential Products for Tracking Progress of Filling Gaps



Detailed Database (Server-Based)
Contains more detailed information required to compile periodic Task Force briefings as outlined in the Plan and capable of producing automated reports

Potential Products for Tracking Progress for Filling Gaps



PCS Gap	Gap Identification Description	Action to Fill Gap	Action Method Description	Start Date	Finish Date	Responsible Organization	Status	Status Description
TP1: Develop processes for tracking progress for filling gaps.	Gap identified in Phase I of PCS by needs and gaps analysis of tracking progress requirements to coordinate South Florida restoration efforts. See related gap TP2 for periodically reviewing and incorporating improvements in approach for identifying needs and gaps and updating the PCS.	Develop processes for tracking the progress for filling gaps.	Action identified as coordinating action to fill gap identified in analysis of tracking progress requirements. Action will develop procedures by which the SCG can track the progress in filling gaps identified in Phase I of PCS and brief the Task Force on progress. Procedures will complement processes developed by TP2 action to fill the gap for periodically reviewing and incorporating improvements in approach for identifying needs and gaps and updating the PCS.	*7/7/05*	*11/2/05*	SCG/Booz Allen *Contact:* Bob Doren dorenr@fiu.edu	*On-time*	Development of processes initiated on 7/11/05 by Booz Allen. Outline of processes for tracking progress is being prepared for SCG review at 8/31/05 meeting.

Interactive Web-Based System
Contains detailed information to compile periodic Task Force briefings as outlined in the Plan and internet-based to facilitate access and information sharing (developed from ecostems.org software for compatibility)

What Procedures are Needed for Reviewing Needs and Gaps, Incorporating Improvements, and Updating the Plan?

Method for Reviewing Needs and Gaps, Incorporating Improvements, and Updating the Plan

- Purpose – Periodically review:
  - Needs and gaps identified
  - The approach for identifying need gaps and actions to incorporate improvements
  - The overall Plan
- Method
  - Specific procedures for satisfying these requirements identified in Phase I will be outlined directly within Phase II of the Plan

Potential Procedures for Reviewing Needs and Gaps, Incorporating Improvements, and Updating the Plan

- Based on the PCS requirements outlined below for the biennial review, the following procedures to address these requirements would be documented in Phase II on the Plan:
  - Requirement 1 - Review of the needs and gaps identified by the Task Force that have been filled and which remain
  - Requirement 2 - Review activities of the Task Force and each individual organization to determine whether each is meeting the goals and responsibilities outlined in the Plan
  - Requirement 3 - Review of the impact of the Plan to assess whether actions are being implemented appropriately and in a timely manner
    - Procedure – A comprehensive review of the information collected for tracking the progress of filling gaps can indicate:
      - ✓ if gaps are being addressed
      - ✓ if responsible organizations are meeting their goals and responsibilities
      - ✓ if Task Force actions are being implemented appropriately and in a timely manner

Potential Procedures for Reviewing Needs and Gaps, Incorporating Improvements, and Updating the Plan (*cont.)*

- Requirement 4 - Review of whether actions taken are in agreement with the stated goals of the Task Force and Plan
  - Procedure – An examination of whether the actions fulfilled or met the outlined goals of the Task Force and Plan can demonstrate if there is agreement
- Requirement 5 – Identification of any new science needs and gaps that have emerged as a result of the restoration process and development of actions to address them
  - Procedure – The current identification process can be applied to detect any new needs and gaps, and actions can be developed to address these new gaps.
- Requirement 6 – Review of the needs and gaps identification process to determine if changes are necessary to make the process more effective and efficient
  - Procedure - The observation of any new needs and gaps that emerged but were **not** detected by the identification process can signify if changes are necessary.

Potential Procedures for Reviewing Needs and Gaps, Incorporating Improvements, and Updating the Plan (*cont.)*

- Requirement 7 - Review of quality science, information sharing, and tracking protocols to determine if changes are necessary and to describe lessons learned in their application
  - Procedure - Surveys of participating organizations can be performed to assess:
    - ✓ whether these protocols are meeting the Plan's goal of ensuring quality science or if modifications are necessary
    - ✓ what lessons have been learned in their application
  - Procedure – An examination of whether tracking procedures provided adequate information to effectively brief the Task Force can demonstrate if changes in action tracking are required.
- Requirement 8 – Review coordination efforts with RECOVER to ensure that needs, gaps, and actions identified by the Task Force are incorporated into the adaptive management process developed for CERP
  - Procedure – An examination if needs, gaps, and actions identified by the Task Force have been effectively incorporated into the RECOVER adaptive management process can indicate if the requirement has been met.

Next Steps

- For development of the Tracking Progress section of Phase II of the Plan, the following actions are required:
  - A decision on the system required for effective tracking of the progress of filling gaps
    - What type of system is required for tracking actions?
    - Does Phase II of the Plan require only a decision of what tool to develop or actual production of the tracking tool?
  - A decision on the procedures for reviewing needs and gaps, incorporating improvements in the process for identifying needs and gaps, and updating the Plan

Plan for Coordinating Science

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Quality Assurance Subgroup Members

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- Kurt Buchholz, Booz Allen, 703-412-7504

Quality Assurance Briefing

- PCS needs, gaps, and actions
- Definitions
- Proposed specific actions
- Next steps

Review of PCS Needs, Gaps, and Actions for Ensuring Quality Science

- Needs
  - Develop coordinated processes to ensure that restoration science conducted at the organizational (e.g., federal, state, or local government) level is sound because it has been subjected to appropriate quality assurance protocols, and that there is a process in place for resolving conflicting opinions and information
  - Establish a process for independent technical review of restoration science products and the convening of independent panels to provide advice on specific technical subjects
- Gap
  - Developing system-wide organizational level protocols for assuring quality science programs
- Action
  - Develop system-wide protocols for organizational level quality programs

Definitions…

- Assurance
  - The act of giving confidence, the state of being certain, or the act of making certain
- Quality Assurance (QA)
  - Planned and systematic activities implemented in a quality system so that quality requirements for a product or service will be fulfilled (i.e., the management or oversight function of a quality system)
- Control
  - An evaluation to indicate needed corrective responses, the act of guiding or the state of a process in which the variability is attributable to a constant system of chance causes.
- Quality Control (QC)
  - The operational techniques and activities used to fulfill requirements for quality (i.e., scientific precautions, such as calibrations and duplications

Source: American Society for Quality (ASQ)
http://www.epa.gov/quality/faq2.html

Definitions (cont)

- Quality System
  - The means by which an organization manages its quality aspects in a systematic, organized manner
  - A framework for planning, implementing, and assessing work performed by an organization, and for carrying out required quality assurance and quality control activities
- Technical and administrative elements of a Quality System
  - Policies and objectives
  - Organizational authority
  - Responsibilities
  - Accountability, and
  - Procedures and practices

Source: http://www.epa.gov/quality/faq2.html

Task Force Quality Assurance Needs and Gaps

1. Assure quality of research conducted by Task Force member agencies
   - Institutions should have a documented and appropriately executed quality system.
2. Assure quality and integrity of Task Force management decisions
   - Task Force should advise member agencies of the elements of quality systems (e.g., through examples) and be assured that received data are of sufficient quality to justify restoration management decisions (e.g., adaptation of RECOVER's quality system).
3. Assure quality of Task Force SCG products
   - Task Force should establish a process for objectively evaluating the quality of its own products (e.g., ISR panel or process).
4. Assure quality of "synthetic" products (comprehensive technical analyses of a topic, species, or region that has been researched by member agencies and others)
   - Task Force should establish a process for convening and facilitating conferences, symposia, and workshops, and an appropriate QA review process for proceedings and related products.

QUALITY ASSURANCE

1. Assure quality of research conducted by Task Force member agencies

- Institutions should have a documented and appropriately executed quality system
  - Member agencies have the responsibility for establishing and implementing their own Quality Systems
  - Appropriate and consistently applied systems ensures quality of data and work products provided to the Task Force
  - Documentation of the agencies' systems ensures defensibility of agency data, and the Task Force's use of that data.
  - Information sharing among member agencies helps establish the appropriate type and level of QA procedures for particular types of work, and supports data comparability (e.g., minimizes use of inconsistent methodology among researchers)
- Action
  - Determine the level of quality assurance needed by the Task Force, and how it will be monitored and managed (e.g., establish a Task Force QA Officer position)
  - Develop a Task Force policy on restoration quality assurance, and incorporate narrative description in the Plan for Coordinating Science

Basic Quality and Management

- Quality System maintenance and improvement by Task Force member agencies is achieved by the application of quality procedures and tools, such as these from the American Society for Quality
- Seven Tool for Quality Improvement
  - Cause-effect diagram
  - Check sheet
  - Control chart
  - Histogram
  - Pareto chart
  - Scatter diagrams
  - Stratification
- Seven Management and Planning Tools
  - Affinity diagram
  - Relations diagram
  - Tree diagram
  - Matrix diagram
  - Matrix data analysis
  - Arrow diagram
  - Process decision program chart (PDPC)
- Additional widely accepted quality system and tools are available from other sources, including EPA

Sources: http://www.asq.org
http://www.epa.gov/quality

2. Assure quality and integrity of Task Force management decisions

- Task Force should advise member agencies of the elements of quality systems and be assured that received data are of sufficient quality to justify restoration management decisions.
  - Under CERP Guidance Memorandum 041.00, RECOVER has established a Quality Assurance Oversight Team (QUOT)
  - QUOT is responsible for providing guidance and oversight of environmental monitoring procedures, QA/QC issues, and data validation for CERP projects and RECOVER
  - A Quality Assurance Systems Requirements (QASR) manual was created to provide specific guidance on QA methods and procedures for CERP data
- Action
  - Adapt RECOVER's quality system to non-CERP projects
  - Establish memoranda of understandings and cooperative agreements among member agencies and with the Task Force
  - Provide member agencies with guidelines and examples of quality systems used by others developing comparable work products

3. Assure quality of Task Force SCG products

- Task Force should establish a process for objectively evaluating the quality of its own products.
  - Per Section 601(j) of WRDA 2000, in June 2004, Army, DOI, and Florida signed an Inter-governmental agreement to establish an ISR panel, then
  - USACE-Jacksonville and established a cooperative agreement with the National Academy of Sciences/National Research Council to provide an ISR, for the purposes of:
    - **Assessing ecological indicators and other measures of progress, and**
    - **Producing the Biennial Report**
  - On 16 December 2004, OMB issued its "Final Information Quality Bulletin for Peer Review (see: http://www.whitehouse.gov/omb/memoranda/fy2005/m05-03.pdf or 70 FR 2664-2677) which provides detailed direction regarding the need for peer reviews, review selection individual v. panel reviews and scoping peer reviews
  - Other Federal agencies (e.g., EPA) have equivalent review policies and procedures for evaluating own products, which are similar to Task Force generated products
- Action
  - Use the ISR so the PCS review and the evaluation of the draft ecological indicators as test cases of the Task Force's procedures for conducting ISRs of Task Force products

4. Assure quality of "synthetic" products (comprehensive technical analyses of a topic, species, or region that has been researched by member agencies and others)

- Task Force should establish a process for convening and facilitating conferences, symposia, and workshops, and an appropriate QA review process for proceedings and related products.
  - The Task Force has successfully conducted restoration workshops to analyze topical, species, and regional research questions.
  - There is consensus that conferences, symposia, and workshops provide valuable information sharing opportunities, with overall result of improve work focus and higher quality results
- Action
  - Develop a Task Force policy that recognizes the importance of an commitment to the conferences, symposia, workshops, that advance scientific understanding and information sharing

Next Steps

- Address SCG's response to the proposed actions
- Develop draft Task Force quality system policies and procedures
- Establish MOUs and cooperative agreements, as needed
- Provide quality system guidance to member agencies
- Evaluate upcoming ISR lessons learned.