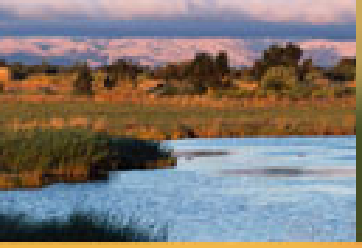
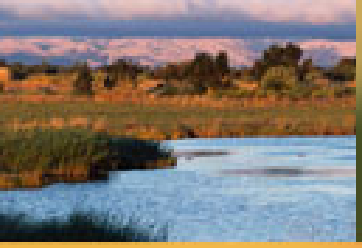


South Bay Salt Pond Restoration Project

Science Program Activities in 2006

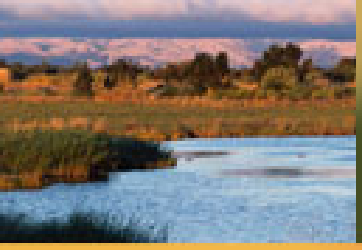
Lynne Trulio
July 13, 2006
Stakeholder Forum



South Bay Salt Pond Restoration Project

Highlights

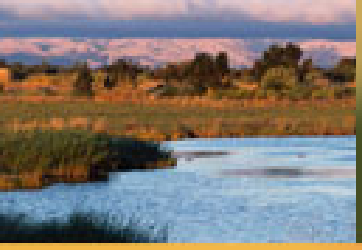
- Science Team Focus in 2006
- Science Symposium
- Key Uncertainties & Applied Studies Questions
- Phase 1 Applied Studies
- Monitoring and Restoration Targets Table
- *Adaptive Management Plan*



South Bay Salt Pond Restoration Project

Science Team Focus in 2006

Science Team Goal: To assist in EIR/S production by helping disseminate current information and by integrating Science Team work into the EIR/S and AMP.

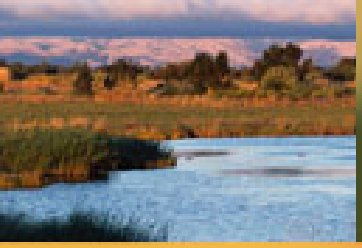


Science Team Focus in 2006

2006 Science Team Activities:

- Ensure existing data and information are made available to the PMT and Consultant Team for use in the EIR/S and AMP
  - Help PMT direct researchers on analysis of data collected
  - Hold a Science Symposium to daylight current information

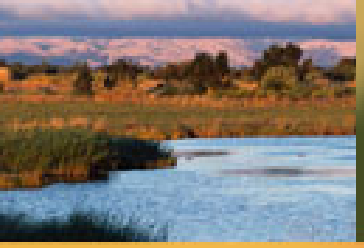
- Work Consultant Team to integrate Science Team Products
  - Key Uncertainties & Applied Studies Questions
  - Phase 1 Actions, Applied Studies, & Restoration Techniques
  - Monitoring and Restoration Targets Table
  - *Adaptive Management Plan*



South Bay Salt Pond Restoration Project

Science Symposium

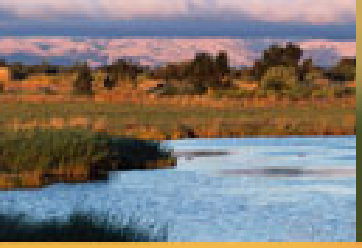
- Held June 6th at San Jose State University
- 18 Speakers and 35 posters
- Key Topics:
  - Watershed Processes: Inputs of Sediment
  - Sediment Transport and Dynamics
  - Water Quality: Productivity and Contaminants
  - Biology: Vegetation, Bay Life and Birds



South Bay Salt Pond Restoration Project

Science Symposium: Highlights

- Documented the great diversity of high quality research related to the Project
- Showed the need for more research on several topics, especially pond-bay interactions and watershed inputs
- Included first look at Island Pond research, Newark ponds study, mercury & birds research
- Showed great array of remote sensing techniques



South Bay Salt Pond Restoration Project

Science Program Information

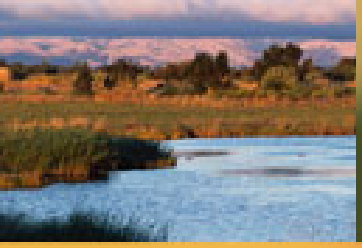
Go to www.southbayrestoration.org/Science.html

-> Science Team -> Meetings -> 2006 Science Symposium

- Abstracts of all posters presented
- Abstracts for all Speakers' talks
- PPT presentations for 12 of the 18 talks

Also on Science Webpage see:

- 2006 Social Science Workshop materials
- *Science Team Two-year Summary*



South Bay Salt Pond Restoration Project

CALIFORNIA DEPARTMENT FISH & GAME

Coastal Conservancy

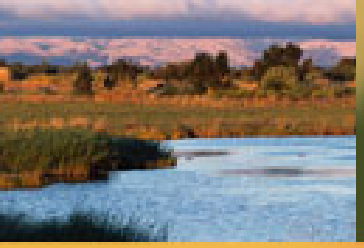
U.S. FISH & WILDLIFE SERVICE

Highlights

- Science Team Focus in 2006
- Science Symposium
- Key Uncertainties & Applied Studies Questions
- Phase 1 Applied Studies
- Monitoring and Restoration Targets Table
- *Adaptive Management Plan*

Project Alternatives as Landscape Visions: Evaluated in the EIR/S

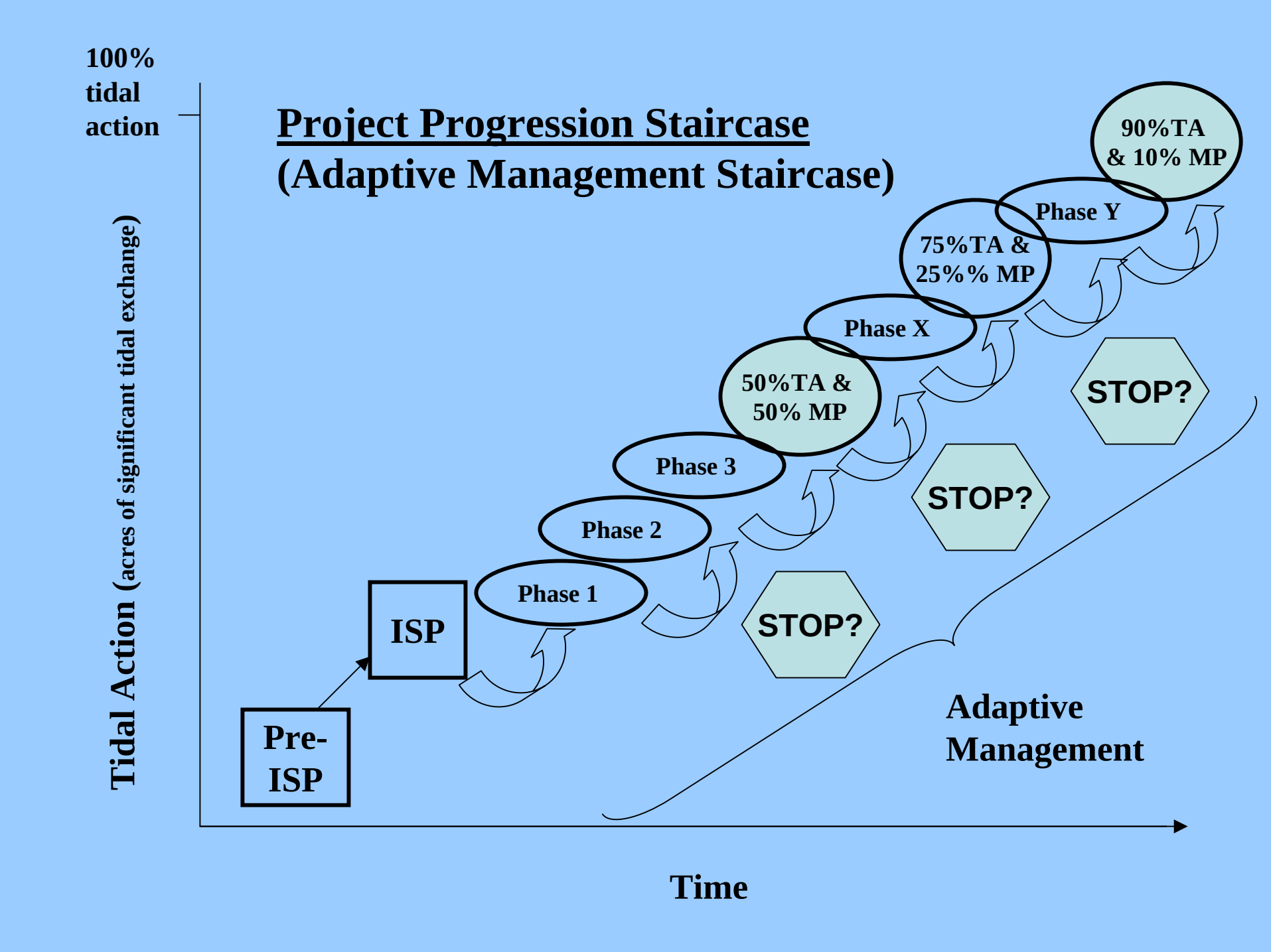
- No Action Alternative
- 50% full tidal action (tidal marsh)/ 50% managed pond
- 90% tidal action/ 10% managed pond



South Bay Salt Pond Restoration Project

There are many uncertainties…

- **Key Uncertainties:** Bird use of changing habitats, mercury, water quality, invasive/nuisance species, sediment, public access, social dynamics
- **We cannot know the final configuration**
- ***Adaptive Management*—**Will tell us how far along the tidal marsh continuum we can go and still reach the Project Objectives


100% tidal action
Project Progression Staircase
(Adaptive Management Staircase)
Tidal Action (acres of significant tidal exchange)
Pre-ISP
ISP
Phase 1
Phase 2
Phase 3
50%TA & 50% MP
STOP?
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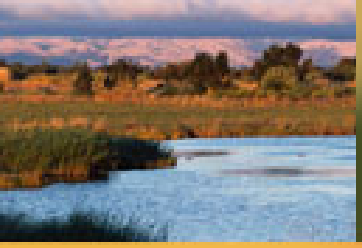
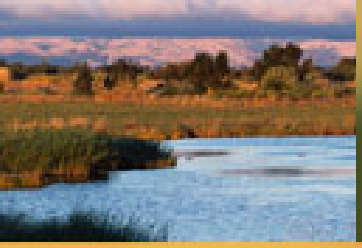
Adaptive Management
Time



South Bay Salt Pond Restoration Project

Adaptive Management is based on…

- **Expectations** how the system will respond to change based on best available information (**restoration targets**)
- **Monitoring** to assess expected response and detect problems early
- **Studies** to reduce uncertainty, help explain system responses and help reach targets



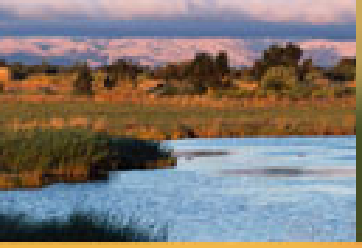
South Bay Salt Pond Restoration Project

AMP Science Section

- **Restoration Targets**—aka, success criteria; quantitative or specific expressions of the Project Objectives

- **Monitoring** to assess progress toward targets, assess regulatory compliance, early warning

- **Applied Studies** to reduce uncertainties in achieving targets—focus on MeHg, bird use, sediments, problem species.

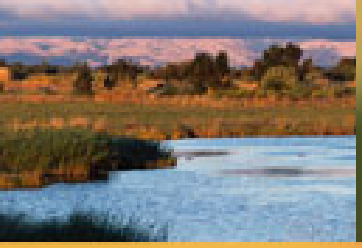


South Bay Salt Pond Restoration Project

Coastal Conservancy

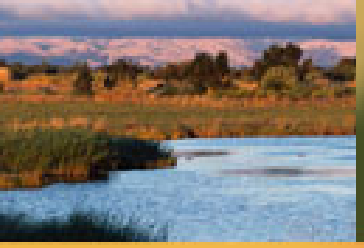
Applied Studies Questions

- Designed to provide information on Key Uncertainties relative to achieving the Project Objectives (restoration targets)
- Are *the* most important questions to address for moving up the AM Staircase
- Linked to specific Project Actions or addressed at a regional level
- Addressed through formal hypothesis testing and experimental design



Key Scientific Uncertainties and Applied Studies Questions (table + summaries)

- 8 Key Uncertainties: Sediment Dynamics, Bird Use of Changing Habitats, Effects on Non-avian Species, Mercury, Water Quality, Invasive/Nuisance Species, Public Access, Social Dynamics
- 20 Applied Studies Questions: For H_o testing
- Applied Studies Implementation: Where tested
- All will have summary descriptions
- AS Questions nearly finalized by Science Team



South Bay Salt Pond Restoration Project

Key Scientific Uncertainties and Applied Studies Questions

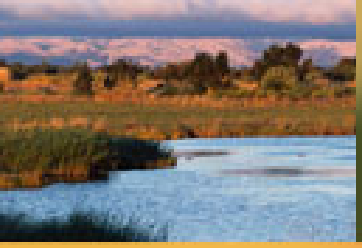
(DRAFT: Not Finalized by the Science Team)

- **Will sediment accretion in restored tidal areas be adequate to create and to support emergent tidal marsh ecosystems within the 50-yr projected time frame?** Sediment deposition has varied greatly over the last 150 years. Large-scale restoration occurring over decades will also affect sediment dynamics throughout the South Bay and regional study will be required to understand these changes.

- **Will ponds reconfigured and managed to provide target water and salinity levels significantly increase the prey base for, and pond use by waterfowl, shorebirds and phalaropes/grebes compared to existing ponds not managed in this manner?**
  Ponds managed as small-scale salt pond systems may provide enhanced benefits for wide range of birds. But, the extent to which they can improve the prey base and increase foraging shorebird densities in the short and long-term is not known.

Phase 1 Actions, Applied Studies and Restoration Techniques

- Phase 1 Actions developed by PMT with assistance from CT and ST
- Include Applied Studies Questions
- Study designs for 2 bird and 1 Hg question
- Restoration Techniques— CT questions related to feasibility or cost; do not require hypothesis testing



South Bay Salt Pond Restoration Project

Phase 1 Actions

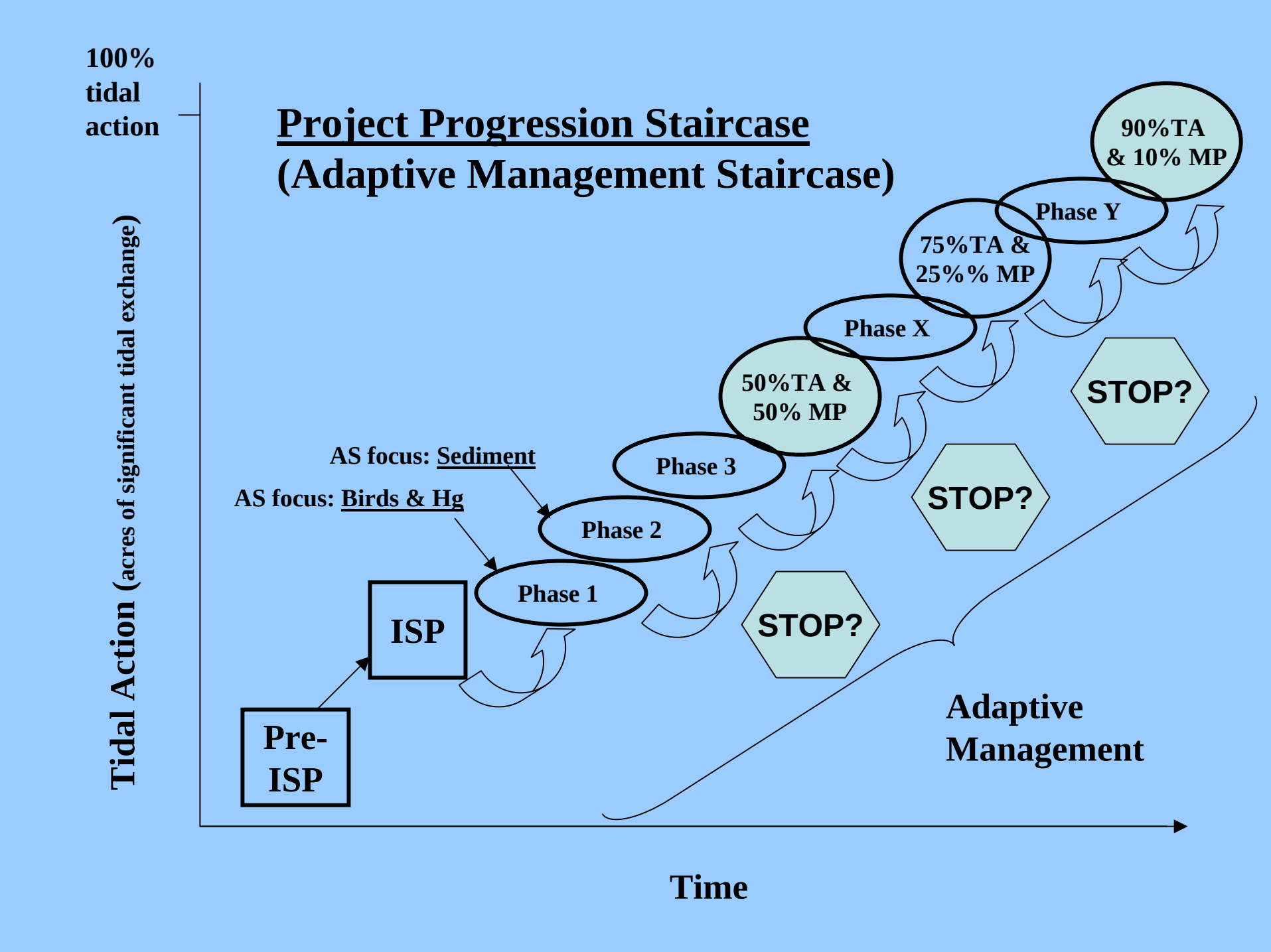
Example--

Phase 1 Action Type: Reconfigured Managed Pond with Islands

Phase 1 Action Locations: A16, SF2

Applied Studies:

* Will ponds that are reconfigured to create large isolated islands for nesting and foraging significantly increase reproductive success for terns and other nesting birds and also increase the numbers and densities of foraging birds over the long term compared to existing ponds not managed in this manner?
* Will landside public access significantly affect birds or other target species on short or long timescales?
* Will public access features provide the recreation and access experiences the public wants over short or long timescales?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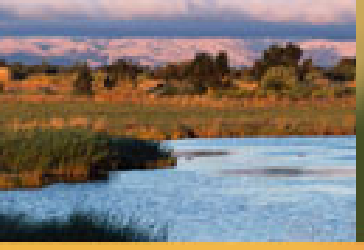
Phase 3
AS focus: Sediment
AS focus: Birds & Hg
Phase 2
Phase 1
ISP
Pre-ISP
STOP?
STOP?
STOP?
Adaptive Management
Tidal Action (acres of significant tidal exchange)
Time

Adaptive Management also requires…

- **Restoration Targets** are quantitative or specific expressions of the Project Objectives. They are the expected system response.
- **Monitoring** to assess progress toward targets, regulatory compliance, early warning
  - Are we reaching our expected system response?
  - Are unpredicted changes occurring?

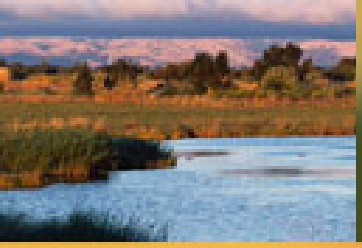


South Bay Salt Pond Restoration Project

Monitoring and Restoration Targets

(the "Big Table")

- Sets Restoration Targets for the Project Objectives that must be met to move up the "Staircase"
- Provides Monitoring Parameters and methods to assess each restoration target
- Gives Management Triggers, when the PMT takes action to avoid missing a target
- Lists Applied Studies that will reduce uncertainty in reaching the target



Monitoring and Restoration Targets

- A plan that links the major elements into a comprehensive AM framework
- Information generated will specifically address those issues critical to moving up the "Staircase"
- Joint Science Team-Consultant Team product, in process
- Central to the *Adaptive Management Plan*

Monitoring and Restoration Targets

Example—Still DRAFT!!

Key Category: Western Snowy Plovers

Restoration Target: Contribute to the recovery of the Western Snowy Plover by providing habitat to support 250 breeding birds within SBSP project area, and maintain a 5-year average productivity of at least one fledged chick per male (per Draft Recovery Plan).

Monitoring Parameter (method): Snowy plover numbers and estimated breeding success, determined through comprehensive, annual South Bay surveys and monitoring during the breeding season

Monitoring and Restoration Targets

Example—Still DRAFT!!

Key Category: Western Snowy Plovers

Management Trigger: Rate of population change deviates significantly from projection

Applied Studies:

* Hg uptake in eggs, related toxicity studies
* Habitat use and productivity in salt pans, furrowed ponds, and islands

Monitoring and Restoration Targets

Example—Still DRAFT!!

Management Actions:

* Analyze all available monitoring data for South Bay, Bay Area, and entire Pacific Flyway to determine whether declines are likely the result of SBSP Project,or the result of external factors (taking into account the downward trends in abundance of plovers over last few decades, which are unrelated to salt pond conversion).

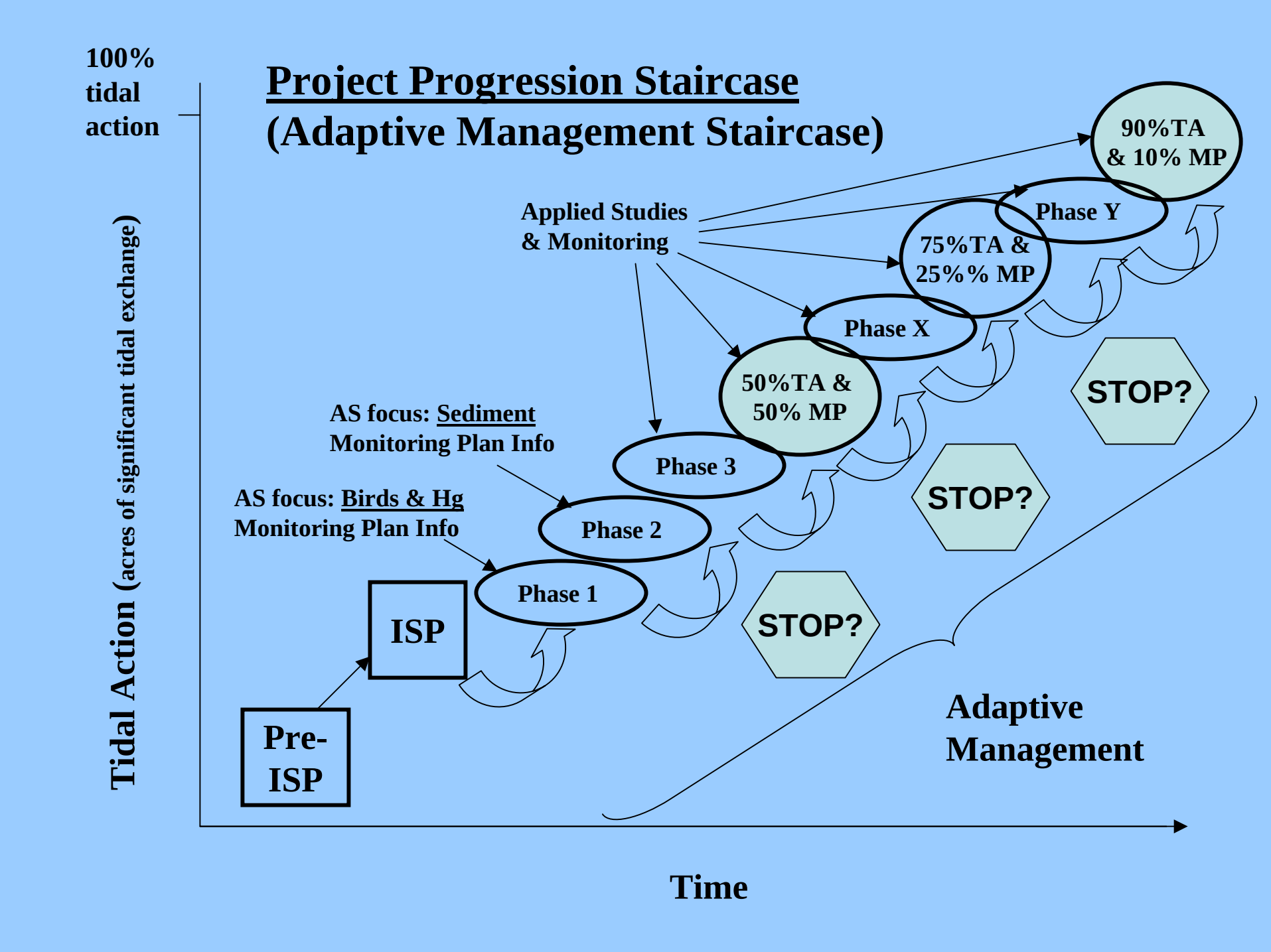
* If declines are likely the result of SBSP Project:

--Applied studies: habitat parameters, contaminant levels, prey levels/type, juxtaposition of nesting and brood rearing/foraging areas, etc. to determine appropriate design/management adjustments.

--Adjust design: Construct more, or more optimal, nesting islands, or create more furrowed ponds; adjust design to reduce Hg uptake.

--Adjust management: Manage water levels and salinities in more ponds for optimal breeding and foraging habitat; control predation, vegetation, human disturbance.

* Reconsider movement up staircase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AS focus: Sediment Monitoring Plan Info
Phase 3
AS focus: Birds & Hg Monitoring Plan Info
Phase 2
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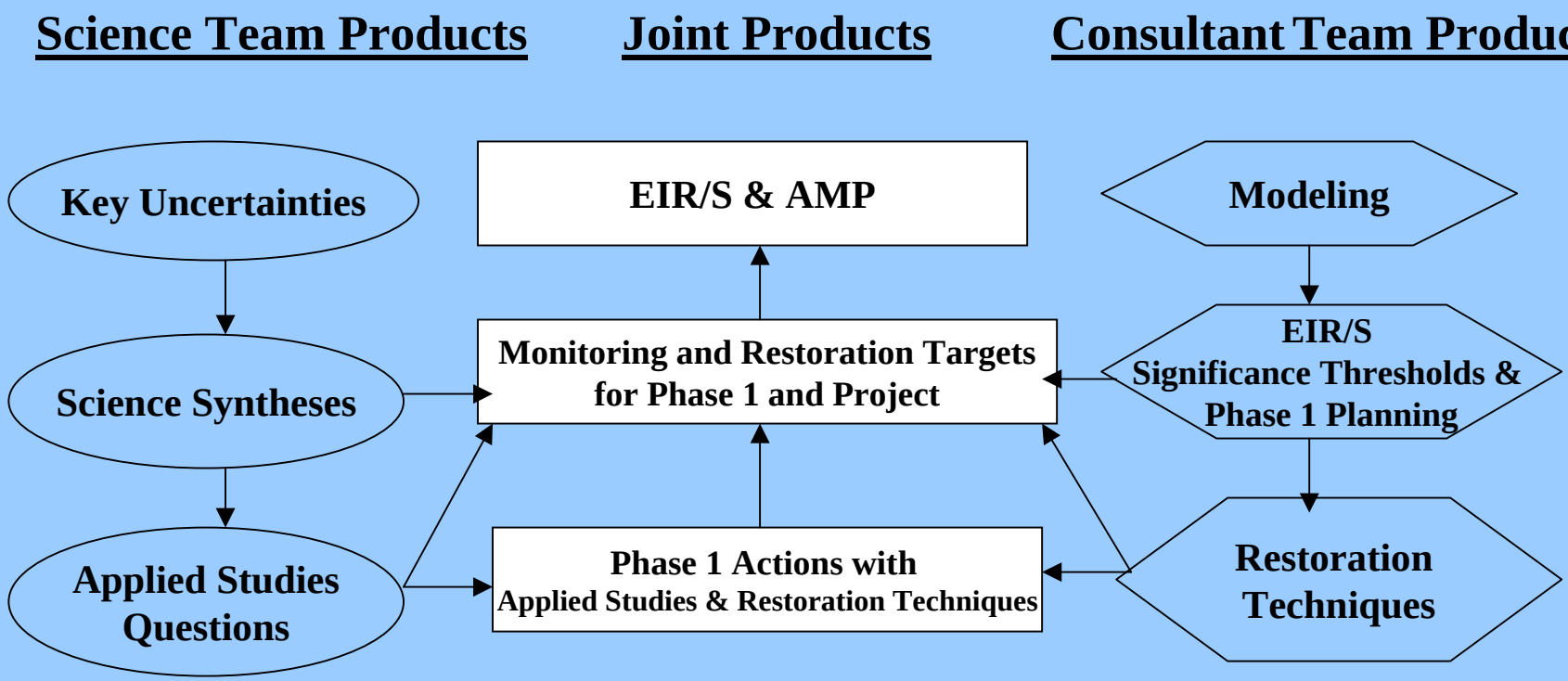
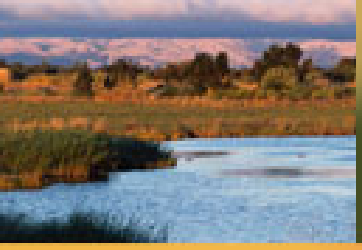
Connecting the Docs:
AM documents feeding into the EIR/S





South Bay Salt Pond Restoration Project

Coastal Conservancy

Upcoming Science Team Activities

- **Future Workshops**
  - Fish and Trophic Levels—Sept?
  - Pond Ecology and Management 2—Dec?
- **New Science Synthesis**
  - Social Dynamics
- **Revised Draft AMP—** end of September