

IEP Science Update & Purpose of Today's Workshop



Interagency Ecological Program

COOPERATIVE ECOLOGICAL
INVESTIGATIONS SINCE 1970

Anke Mueller-Solger
IEP Lead Scientist
CALFED Science Program
May 26, 2009

IEP Science Update & Purpose of Today's Workshop



Interagency
Ecological Program

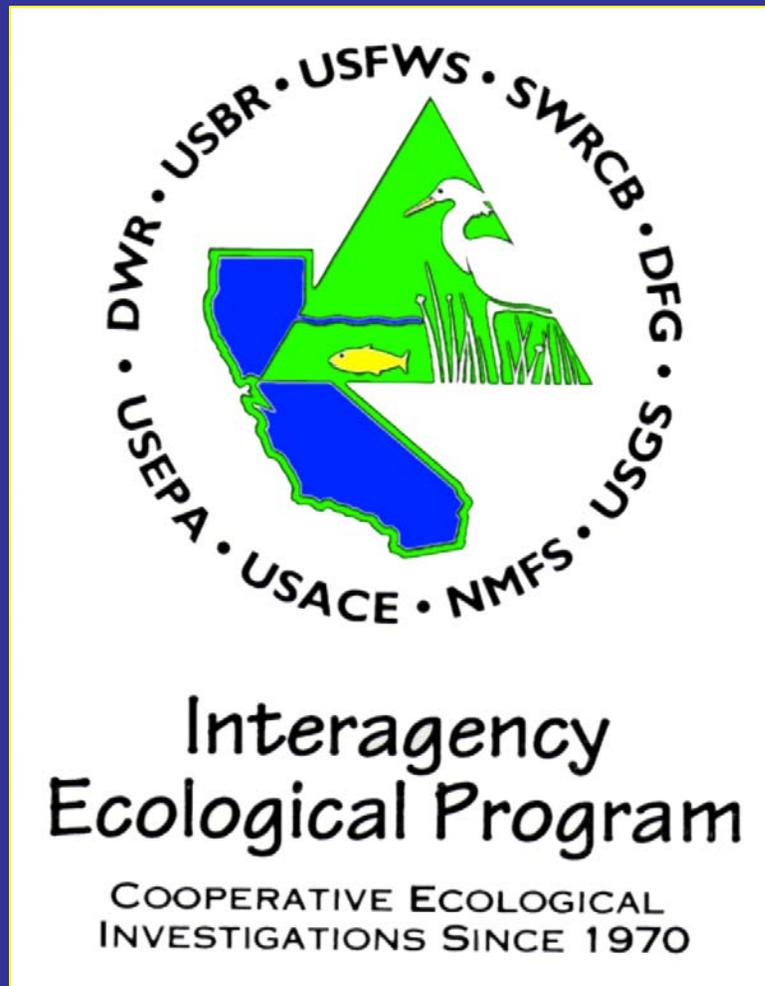
COOPERATIVE ECOLOGICAL
INVESTIGATIONS SINCE 1970



started July 1, 2008

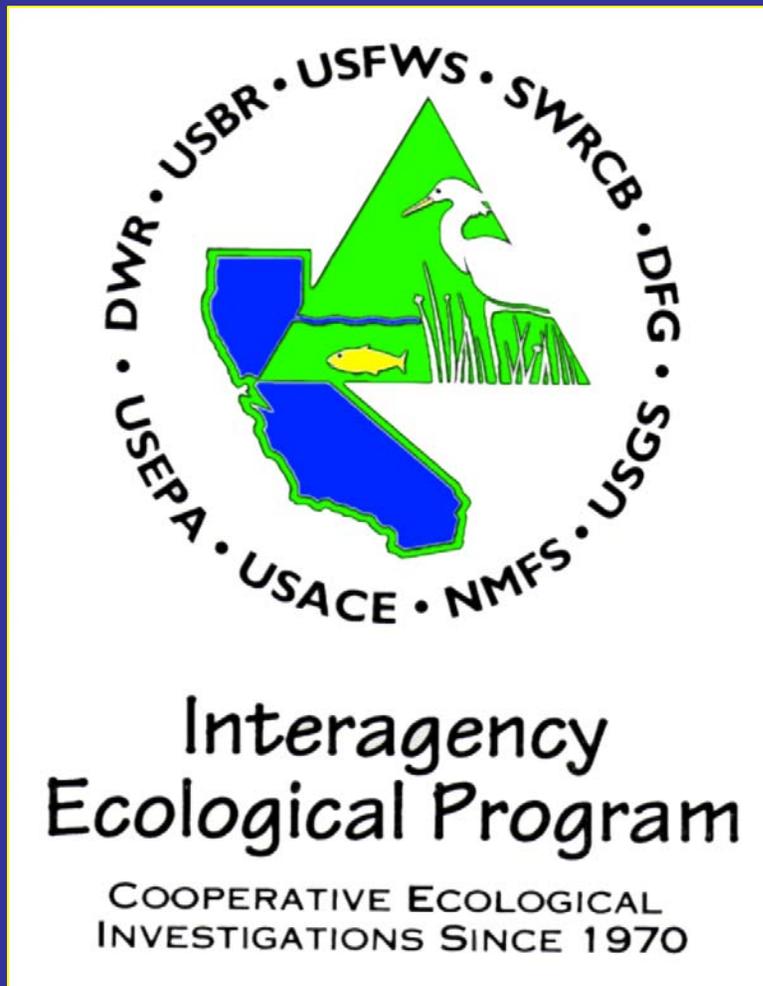
Anke Mueller-Solger
IEP Lead Scientist
CALFED Science Program

IEP Science Update & Purpose of Today's Workshop



What is
IEP Science?

I EP Science Update & Purpose of Today's Workshop



What is I EP Science?

I EP Mission: Provide information on the factors that affect ecological resources in the Sacramento -San Joaquin Estuary that allows for more efficient management of the estuary.

IEP Science Update & Purpose of Today's Workshop



What is IEP Science?

IEP Mission: Provide information on the factors that affect ecological resources in the Sacramento-San Joaquin Estuary that allows for more efficient management of the estuary.

NO "Science"

IEP Science Update & Purpose of Today's Workshop



Interagency
Ecological Program

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INVESTIGATIONS SINCE 1970

What is
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Interagency
Ecological Program

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INVESTIGATIONS SINCE 1970

What is
IEP Science?

Long-Term
Cooperation



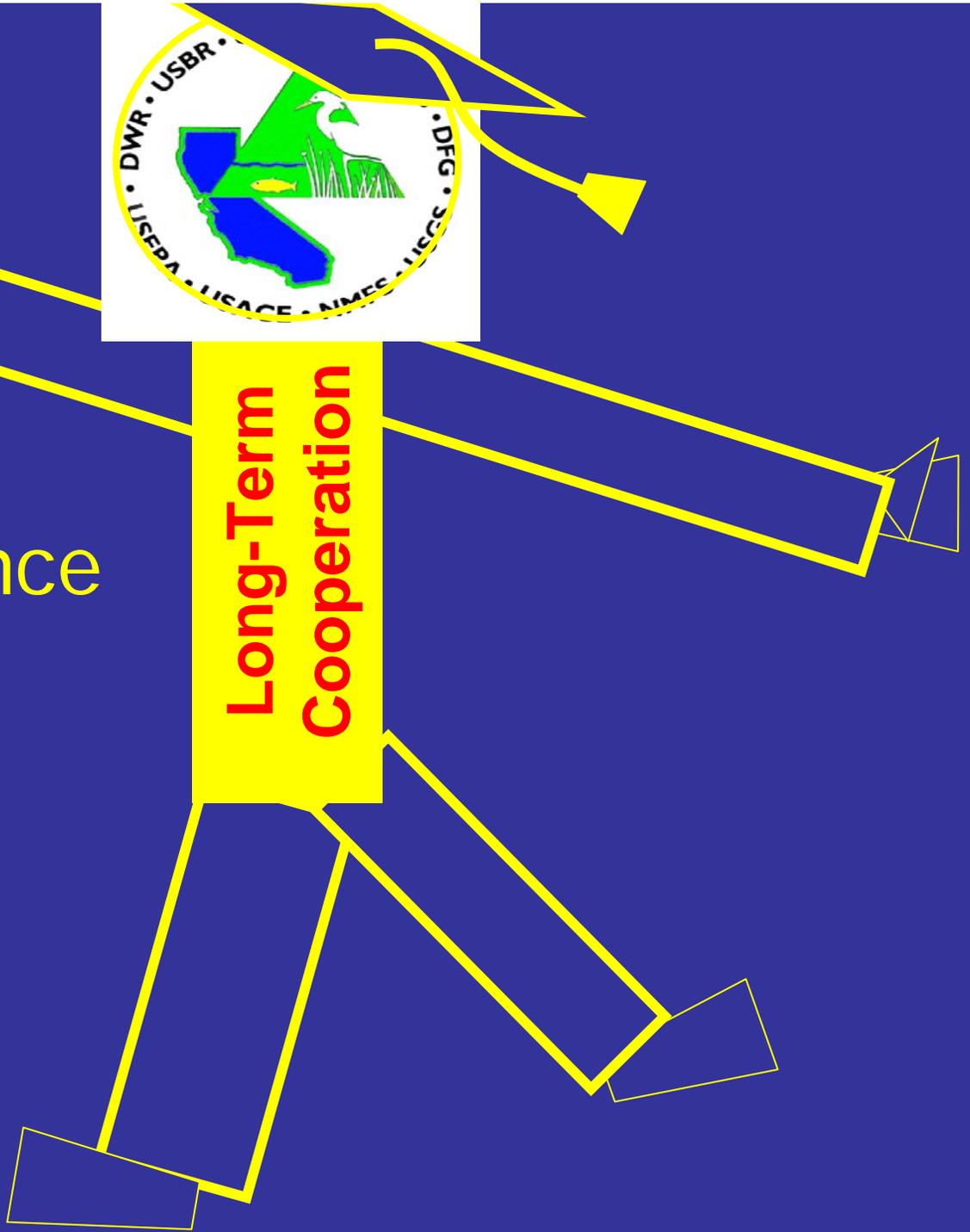
Meet
Dr. IEP-Science

**Long-Term
Cooperation**

Dr. I EP-Science
does science!



**Long-Term
Cooperation**





**Long-Term
Cooperation**

Monitoring

I EP Monitoring:

- Long-term
- Compliance
- Baseline

Fall abundance in 2008 continued low for pelagic fishes.

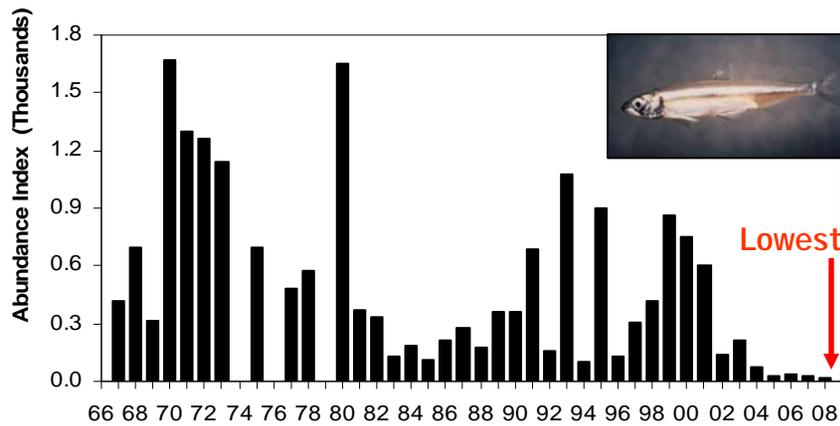
Source DFG 2008 Fall MW Trawl
No sampling 1974 and 1979



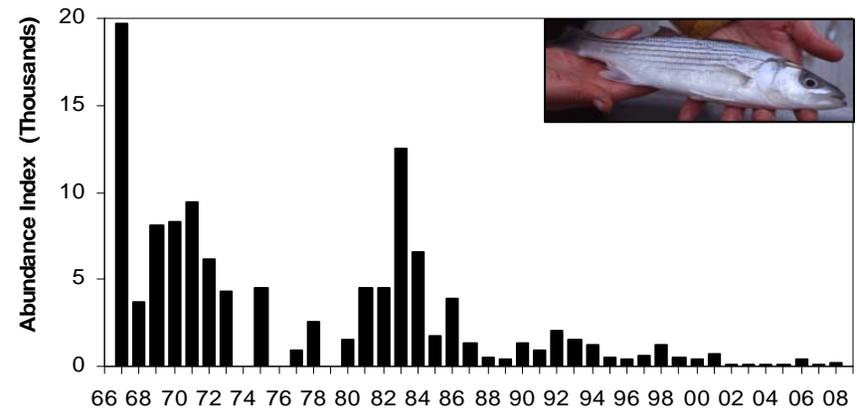
Long-Term
Cooperation

Monitoring

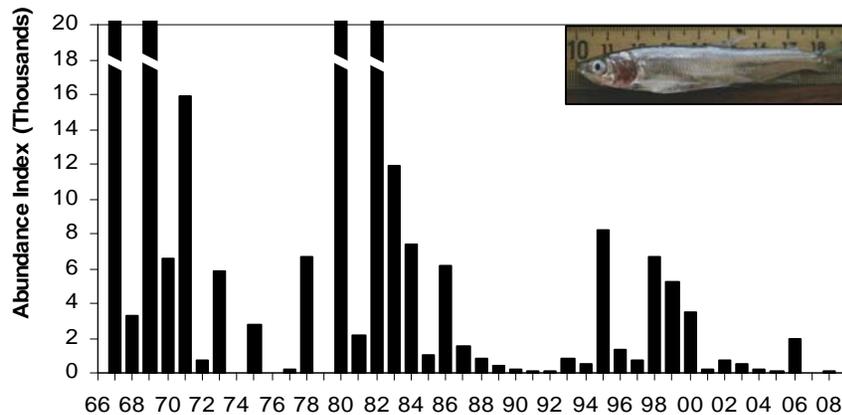
Delta Smelt



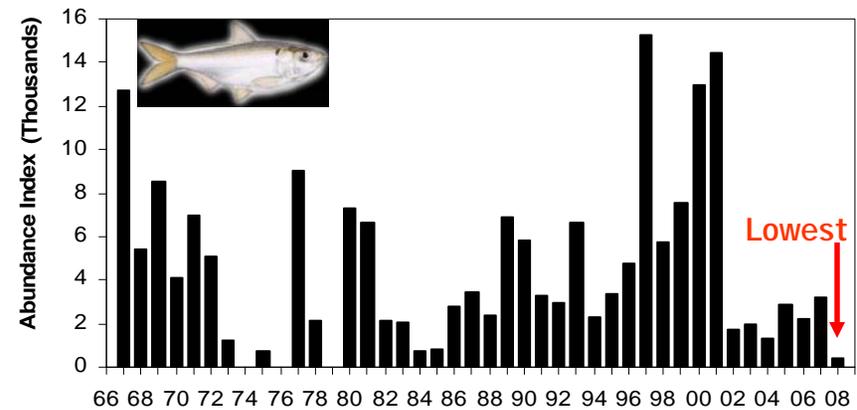
Striped Bass



Longfin Smelt



Threadfin Shad





**Long-Term
Cooperation**

Monitoring

More IEP Monitoring
Results:

June, August, October
Workshops!



**Long-Term
Cooperation**

Monitoring

Research

“Special Studies”

Pelagic Organism Decline Investigations

2005



Long-Term Cooperation

Monitoring

Research

Fish survey
Each year, scientists survey dozens of locations along the Delta, using a trawl net to capture a sampling of fish. The numbers at right are calculations of population density, based on the average number of fish caught in a specified volume of water.

Copepods This microscopic, forked-tailed animal is a type of zooplankton. Copepods are usually 1 to 1.5 mm long and help form the bottom of the food chain in the Delta.

Delta smelt (all ages) Typically living just one year, Delta smelt grow to about 4 inches.

Juvenile striped bass (2 to 1 year old) Striped bass grow to 18 inches, the legal minimum for anglers to keep. Within three years and can grow to 4 feet and 70-plus pounds.

DELTA DANGER
A decline in fish species and their food source is a reminder of a recurring worry in the West: A broad ecosystem collapse

By Matt Weiser
SUNSET WRITER

Fortunes of a key Delta fish keep sinking

Members of Congress Seek Answers on Delta Fish Decline
by Dan Bacher Thursday, May 12, 2005 at 11:23 PM
danielbacher@hotmail.com

Decline In Delta Forage Species Alarms Scientists
May 25, 2005
By Dan Bacher

Officials challenged over Delta smelt deaths
By Matt Weiser
SUNSET WRITER

Delta smelt threatened

A massive restoration program may have nothing left to say
By Matt Weiser

Food chain collapsing in the California Delta

Pelagic Organism Decline

CALFED Science Program - POD page - Windows Internet Explo...

http://www.science.calwater.ca.gov/pod/pod_index.html

File Edit View Favorites Tools Help

Google Search

CALFED Science Program - ...



[Delta Smelt](#)
[Distribution](#)
[Comparing smelts](#)



[Longfin Smelt](#)



[Striped Bass](#)
[DFG Striped Bass Program](#)



[Threadfin Shad](#)

IEP POD SYNTHESIS REPORTS

- 2008 Synthesis of Results - Pending Release
- [Summary of Ammonia Results](#), March 2009 prepared for the [CALFED workshop on Ammonia/Ammonium](#)
- [2007 Synthesis of Results](#)
- [2005 Synthesis of Results](#)
- [2005 CALFED Review](#)

IEP POD WORKPLANS

- [2009 Addendum to 2008 Workplan](#)
- [2008 Workplan](#)
- [2006-2007 Workplan](#)
- [2005 Workplan](#)

IEP POD LINKS

- [POD Home](#)
- [POD Management Team](#)
- [POD Work Teams](#)
- [Final Study Reports](#)
- [Publications](#)
- [IEP Calendar](#)

 **IEP NEWSLETTER**

The IEP Newsletter is now available online.

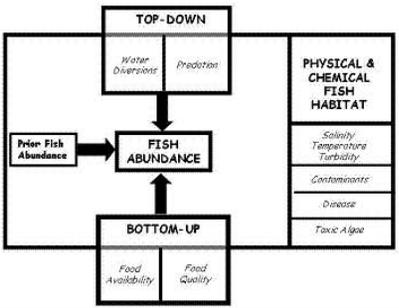
 **Science News**

News from the CALFED Science Program

The CALFED Science Program's Science News is now available online.

 **SAN FRANCISCO ESTUARY & WATERSHED SCIENCE**

The San Francisco Estuary and Watershed Science is now available online

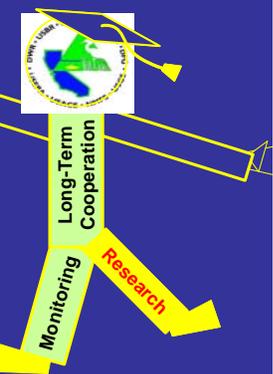


The flowchart illustrates the factors influencing Fish Abundance. It is divided into 'TOP-DOWN' and 'BOTTOM-UP' categories. 'TOP-DOWN' includes 'Water Diversions' and 'Predation'. 'BOTTOM-UP' includes 'Food Availability' and 'Food Quality'. 'FISH ABUNDANCE' is the central outcome, also influenced by 'Physical & Chemical Fish Habitat' factors: 'Salinity', 'Temperature', 'Turbidity', 'Contaminants', 'Disease', and 'Toxic Algae'. 'Prior Fish Abundance' is shown as a feedback loop into the central 'FISH ABUNDANCE' box.



Interagency Ecological Program
COOPERATIVE ECOLOGICAL INVESTIGATIONS SINCE 1970

Internet 100%



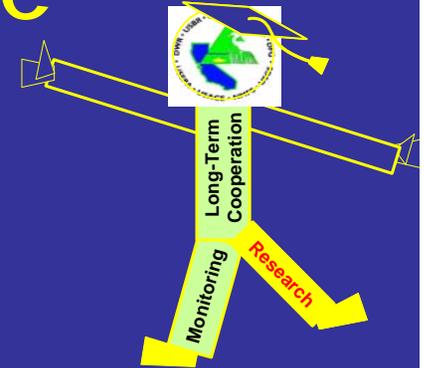
Pelagic Organism Decline

2009 POD Workplan:

- 55 studies, > 100 scientists, ~ \$12 million
- Many elements continuing from 2008
- New elements focus on modeling & synthesis
- Bond freeze & furlough effects

2010 POD Workplan: delta smelt fall habitat study

More: Public workshop, coming soon



IEP POD WORKPLANS

- [2009 Addendum to 2008 Workplan](#)
- [2008 Workplan](#)
- [2006-2007 Workplan](#)
- [2005 Workplan](#)

PHYSICAL & CHEMICAL FISH HABITAT

- Salinity
- Temperature
- Turbidity
- Contaminants
- Disease
- Toxic Agents

Interagency Ecological Program
COOPERATIVE ECOLOGICAL INVESTIGATIONS SINCE 1970

IEP NEWSLETTER
The IEP Newsletter is now available online.

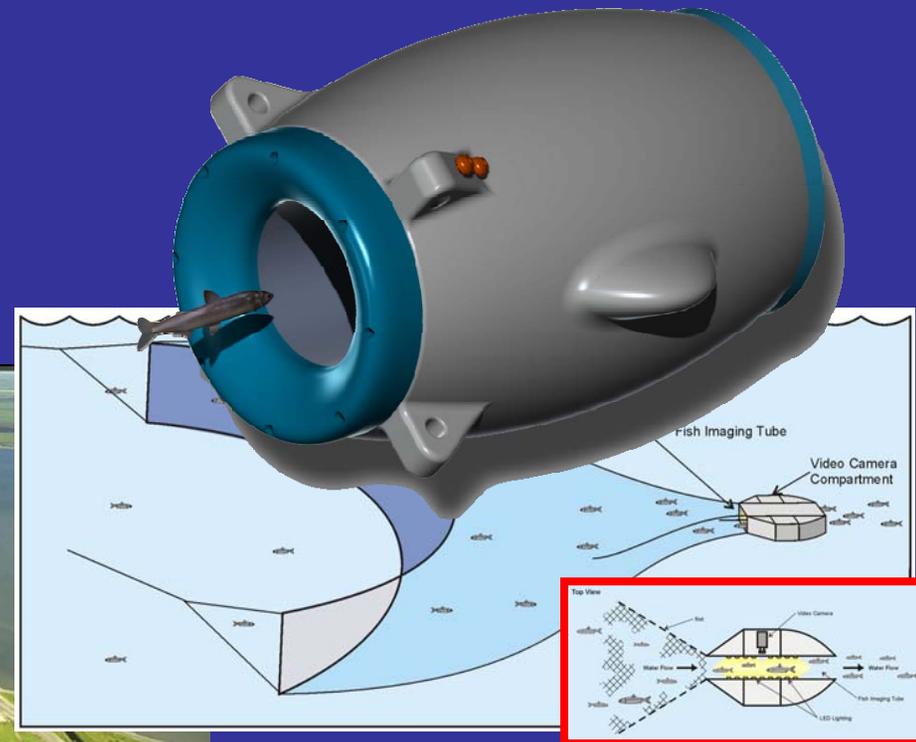
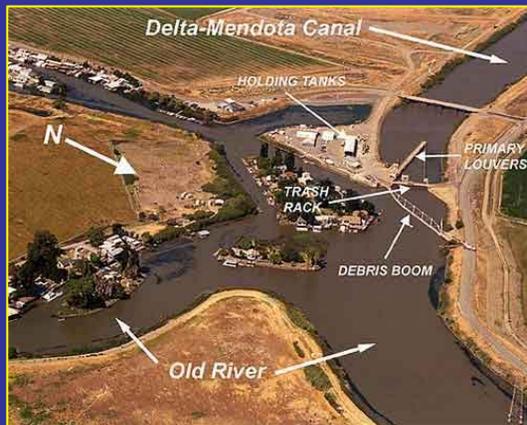
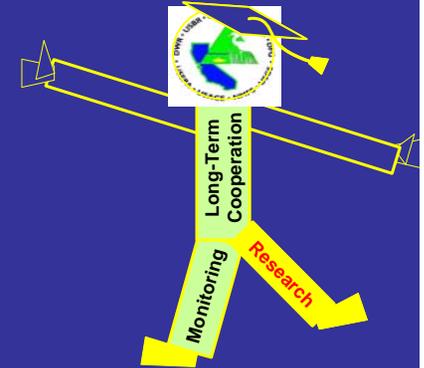
Science News
News from the CALFED Science Program
The CALFED Science Program's Science News is now available online.

SAN FRANCISCO ESTUARY WATERSHED SCIENCE
The San Francisco Estuary and Watershed Science is now available online.

Internet 100%

Other IEP Research:

- Fish Facilities
- Monitoring Technologies

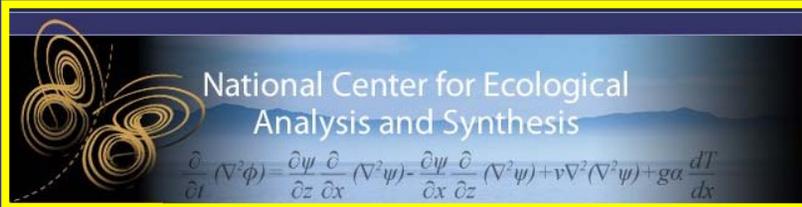


**Analysis
Synthesis
Review**

**Long-Term
Cooperation**

Monitoring

Research



September Workshop

IEP Science Advisory Group

CALFED Science Reviews

**Analysis
Synthesis
Review**

**Long-Term
Cooperation**

Communication

Monitoring

Research

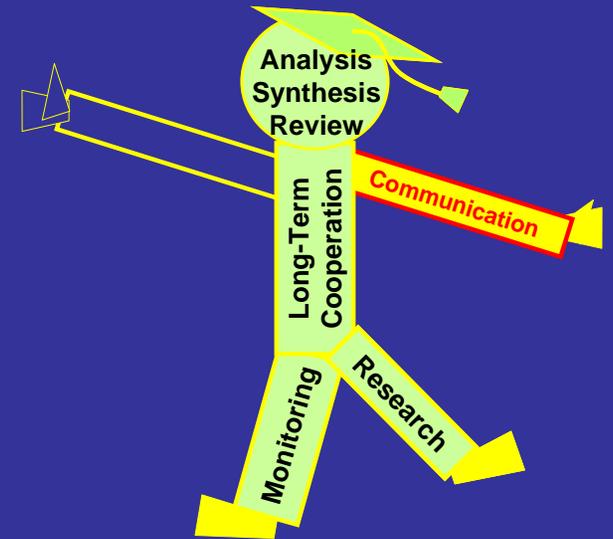
- Conferences & Workshops
- POD Synthesis Reports (& book?)
- Publications and Study Reports
- IEP Website – redesign!
- IEP Data portals – update!
- IEP Newsletter – rejuvenation!



IEP NEWSLETTER

The IEP Newsletter is now available online.

Redesigned IEP Web Hub/Portal



CA.GOV DEPARTMENT OF WATER RESOURCES

Home | Newsroom | Flood & Safety | Planning | State Water Project | Funding | Environment | Supply & Use | Data

Climate Change and California's Water | Delta Initiatives | Drought | All Environment Topics...

Interagency Ecological Program

Cooperative Ecological Investigations in the San Francisco Estuary since 1970

ACTIVITIES

- Monitoring
- Research
- Pelagic Organism Decline (POD) Investigations
- Program Reviews
- Workshops and Events
- Activities Archive

PRODUCTS

- Data and Metadata
- IEP Newsletter
- Reports
- Journal Publications
- Maps
- Pictures

ABOUT

- About the Estuary
- About the IEP
- IEP Teams
- IEP Opportunities
- Calendar
- Contact Us

May 26 & 27, 2009, CALFED Delta Room, Sacramento:

Public IEP Workshop featuring

the latest models combining physics and fish

and a panel of IEP Science Advisors

[Click here to read more](#)

DWR News Archives

MONITORING	RESEARCH	WORKSHOPS AND EVENTS
USFWS launches new boat, the RV Confluence	2009 Pelagic Organism Decline Workplan is online	2009 IEP workshop series will take place in Sacramento and Davis

Delta Juvenile Fish Monitoring

U.S. Fish & Wildlife Service

Delta Juvenile Fish Monitoring Program

Pacific Southwest Region

Search

CALFED Science Program - ...

WELCOME TO CALFED BAY-DELTA PROGRAM

CALFED Program | California Delta | CALFED Science | Program Performance

About the Program | Independent Science Board | Research | Product Library | Contact Info

Feedback!

science program >> IEP SAG Review

Browse By Topic

INTERAGENCY ECOLOGICAL PROGRAM (IEP) "PHYSICAL MODELING AND FISH MANAGEMENT" WORKSHOP

May 26-27, 2009
CALFED Delta Room
650 Capitol Mall, 5th Floor
Sacramento, CA

An Applied Research Prog...

U.S. Department of the Interior | Bureau of Reclamation

RECLAMATION

Managing Water in the West

Search Reclamation

The Tracy Research Website: Tracy Fish Facility Improvement Program (TFFIP)

DFG - Bay Delta Region

CA.GOV DEPARTMENT OF FISH AND GAME

BDR Home | DFG Home

IEP Projects | Biological Resources | Striped Bass Program | Reports and Publications

STUDIES AND Interagency Ecological Program Activities

**Analysis
Synthesis
Review**

Modeling (?)

**Long-Term
Cooperation**

Communication

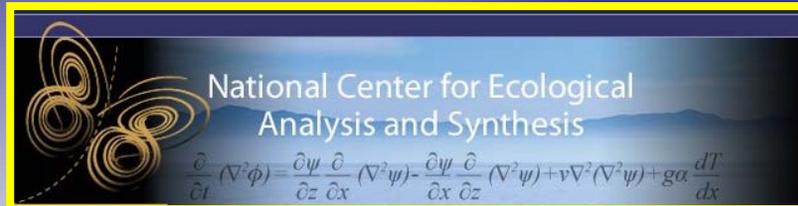
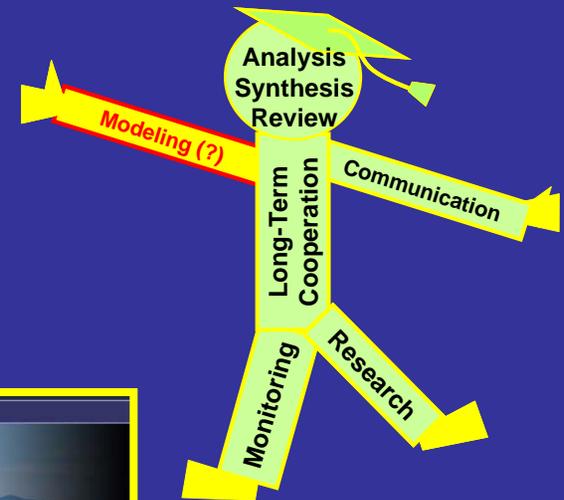
Monitoring

Research

Models:

- Simplified, abstract view of complex reality
- Conceptual: Narrative, Graphical
- Mathematical: Statistical, Numerical Simulation
- Physical, Chemical, Biological, & Coupled

IEP: Lots of Conceptual and Statistical Models



September Workshop

Ecological Applications, 5(1), 1995, pp. 272-289
© 1995 by the Ecological Society of America

Original X2 Paper

ISOHALINE POSITION AS A HABITAT INDICATOR FOR ESTUARINE POPULATIONS¹

ALAN D. JASSBY
Division of Environmental Studies, University of California, Davis, California 95616 USA

WILLIAM J. KIMMERER
BioSystems Analysis, Tiburon, California 94920 USA

STEPHEN G. MONISMITH
Department of Civil Engineering, Stanford University, Stanford, California 94305 USA

CHARLES ARMOR
California Department of Fish and Game, Stockton, California 95205 USA

JAMES E. CLOERN
U.S. Geological Survey, MS 496, Menlo Park, California 94025 USA

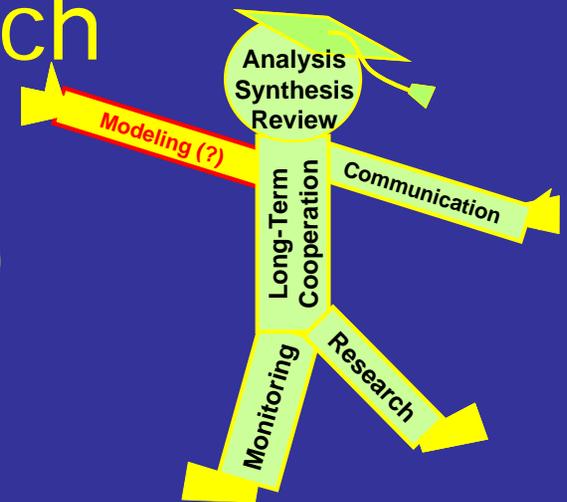
THOMAS M. POWELL
Division of Environmental Studies, University of California, Davis, California 95616 USA

JERRY R. SCHUBEL
Marine Sciences Center, State University of New York, Stony Brook, New York 11794 USA

TIMOTHY J. VENDLINSKI
U.S. Environmental Protection Agency, San Francisco, California 94105 USA

I EP: Historically, not as much numerical (simulation) modeling → CWEMF (1994)

- I EP important data source
- Long-term support of USGS hydrodynamics group
- Modeling studies part of POD – esp. coupled physical-biological-chemical



**Pete Smith: 2009 CWEMF
Hugo Fischer Award**

SAN FRANCISCO ESTUARY & WATERSHED SCIENCE
Investigating Particle Transport and Fate in the Sacramento-San Joaquin Delta Using a Particle Tracking Model
Wim J. Kimmerer, San Francisco State University*
Matthew L. Nobriga, CALFED Science Program

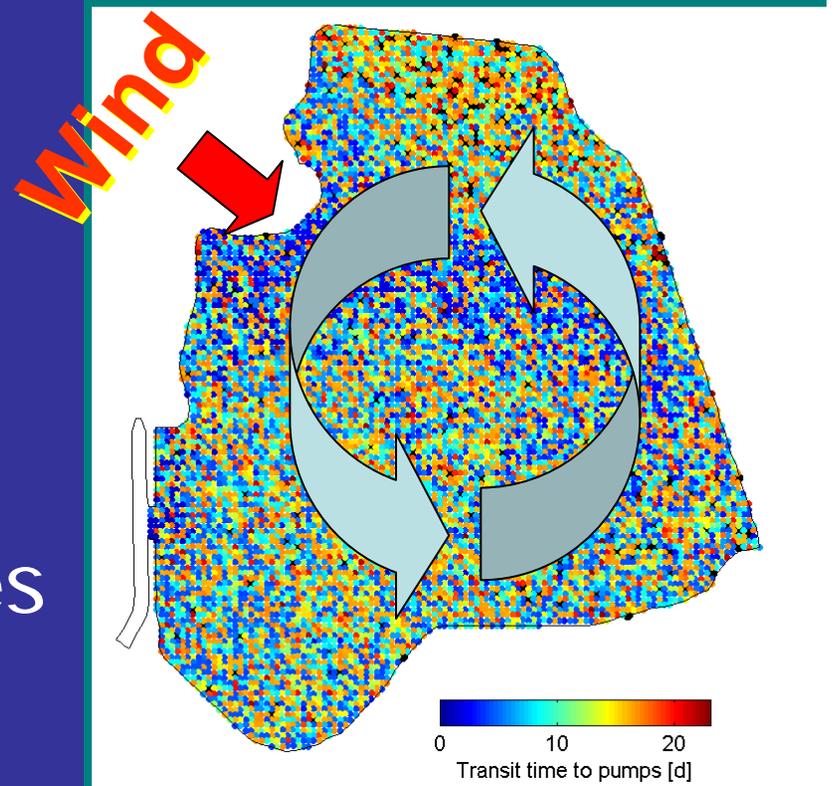
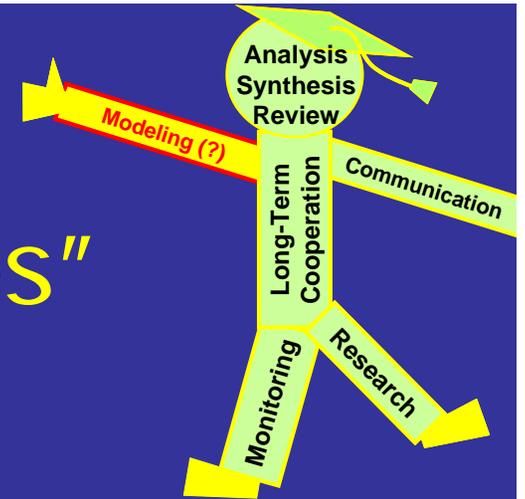
SAN FRANCISCO ESTUARY & WATERSHED SCIENCE
Losses of Sacramento River Chinook Salmon and Delta Smelt to Entrainment in Water Diversions in the Sacramento-San Joaquin Delta
Wim J. Kimmerer, San Francisco State University
JUNE 2008

Contaminants Fate & Transport Modeling

POD Clifton Court Forebay Studies - "Pre-screen losses"

2008 Results:

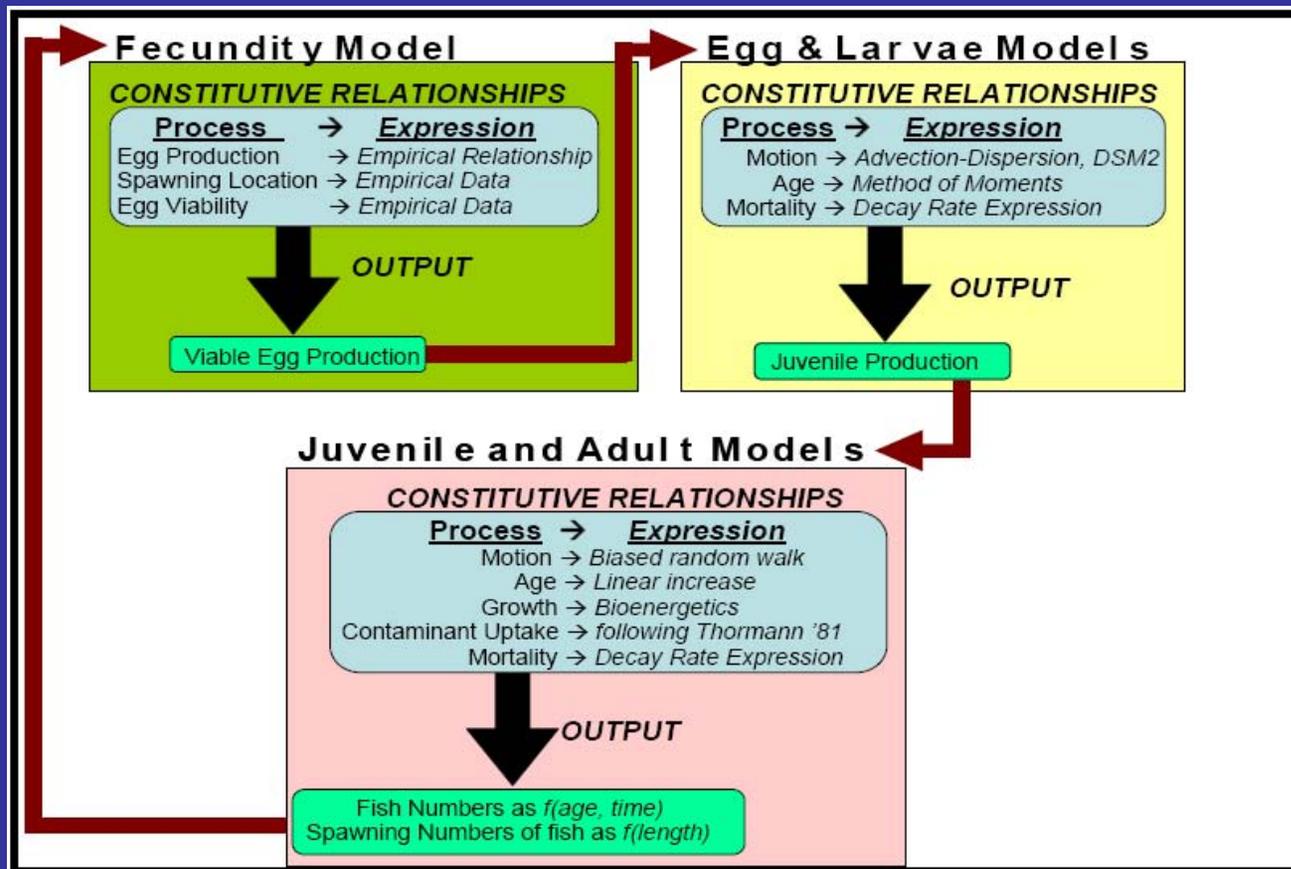
- "Mixed" residence time (Gross & MacWilliams)
- Counter-clockwise gyre (Ruhl, USGS)
- Low delta smelt recoveries (Castillo, FWS)



June 2007 Simulation

POD - Striped Bass Life Cycle Model (& new extension to longfin smelt)

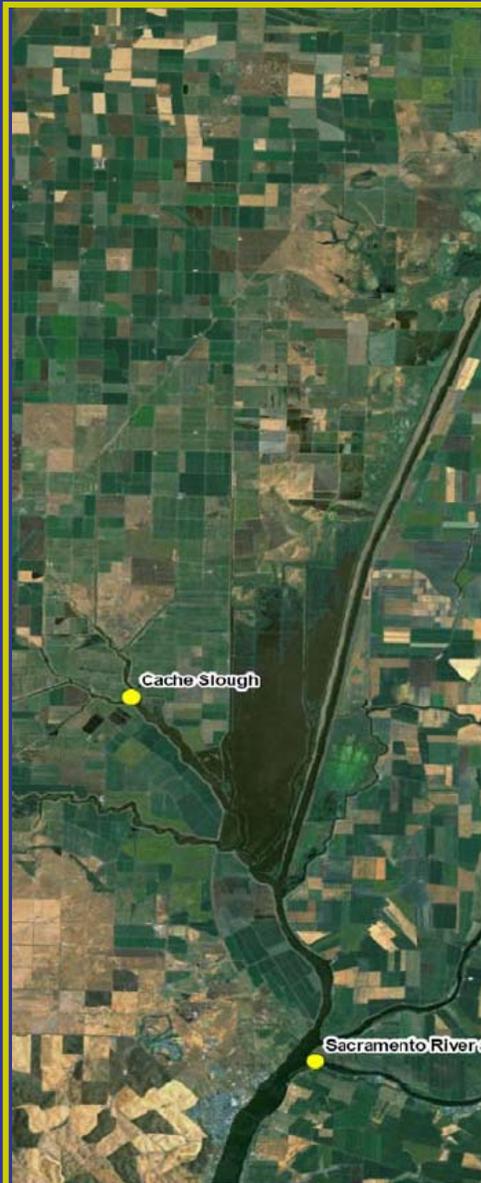
Frank Loge et al, UCD



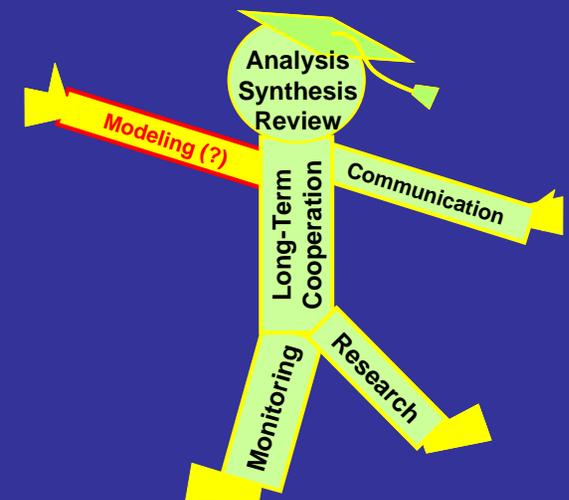
(Delta smelt IBM
by Kimmerer et
al: presentation
in September)

POD - Hydrodynamics of the Cache Slough complex

(Sommer, Schoellhamer, et al)



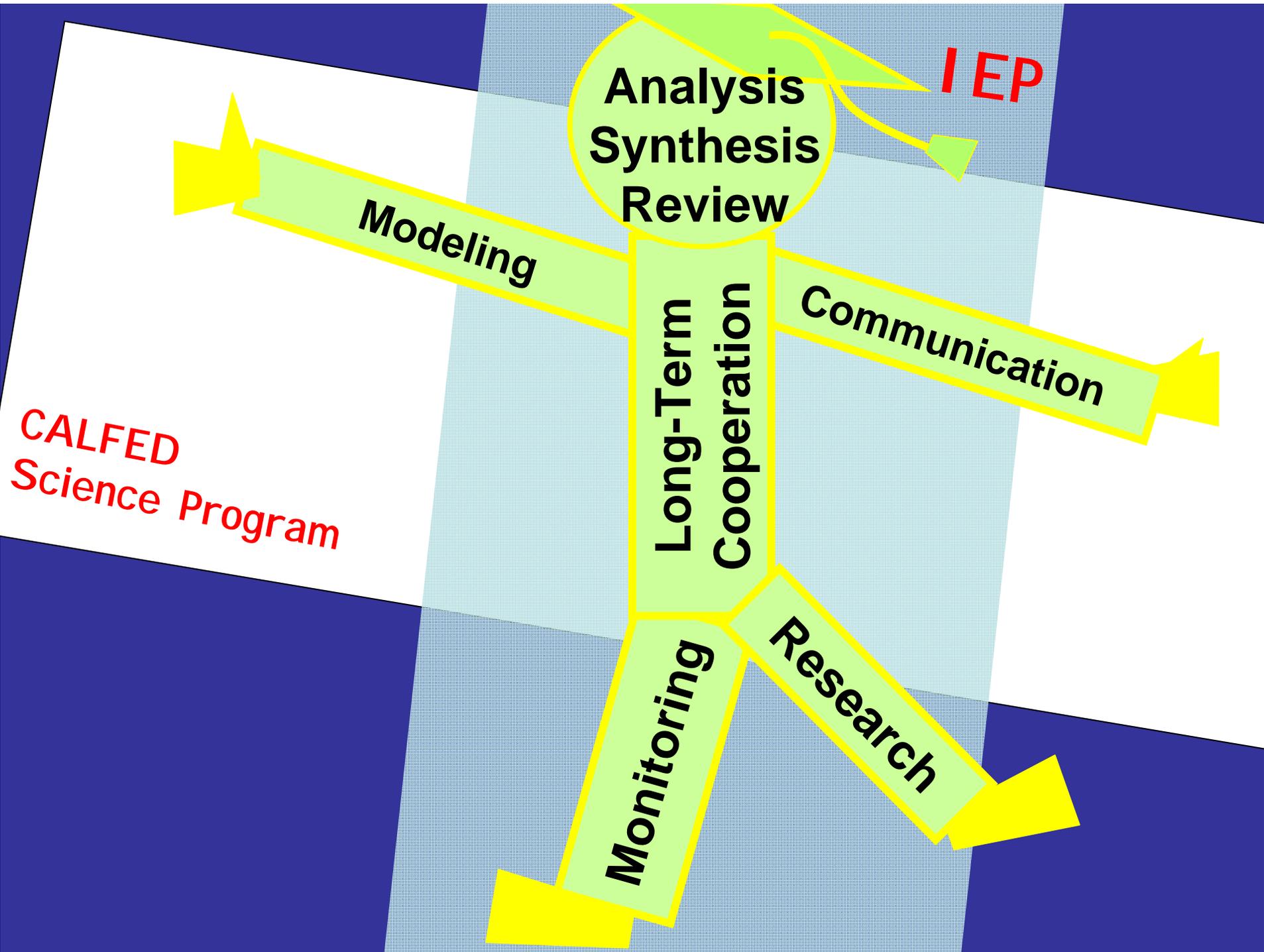
- North delta is important fish habitat
- Inundation of Liberty Island likely had a huge effect on Delta hydrodynamics
- Is Liberty Island a source of turbidity & food?



Not IEP:

- Hydrodynamic modeling for ongoing water project management/operation
- Modeling for new Delta conveyance options
- Hydrodynamic model intercomparison

New long-term cooperative modeling program through CALFED Science?



Analysis
Synthesis
Review

IEP

Modeling

Long-Term
Cooperation

Communication

CALFED
Science Program

Monitoring

Research

Today's Workshop:

Physical Modeling and Fish Management In the San Francisco Estuary

Purpose:

- Modeling overview
- How can the models inform fish biologists and managers ?
- Public discussion: model applications and limitations, role of the IEP
- Initiate a review of IEP hydrodynamic modeling activities by the **IEP Science Advisory Group**

IEP Science Advisory Group (SAG)

- Standing expert panel of independent, external science advisors
- Chair (S. Monismith), permanent & “special members”
- Established in the 1990s
- Reviews IEP program elements
- Provides **independent expert advice**
 - Delta Smelt Monitoring and Studies Program (2005)
 - Environmental Monitoring Program (2001-2002)
 - San Francisco Bay Study Program (1999)
 - Long-term Monitoring Program (1995)

2009 IEP SAG Charge

1. Independent assessment of IEP and IEP-related hydrodynamic modeling
2. Recommend a scientifically sound, relevant, and appropriate modeling program intended to address the needs of current and potential users
3. Recommend a strategy for better connecting modeling and data collection
4. Give advice regarding the role of IEP in conducting and supporting modeling activities

FYI:

Completely separate, but with the same &
additional panel members:

**CALFED Science Review of
"2-Gates Proposal" for the Delta**

Dr. Cliff Dahm

CALFED Lead Scientist