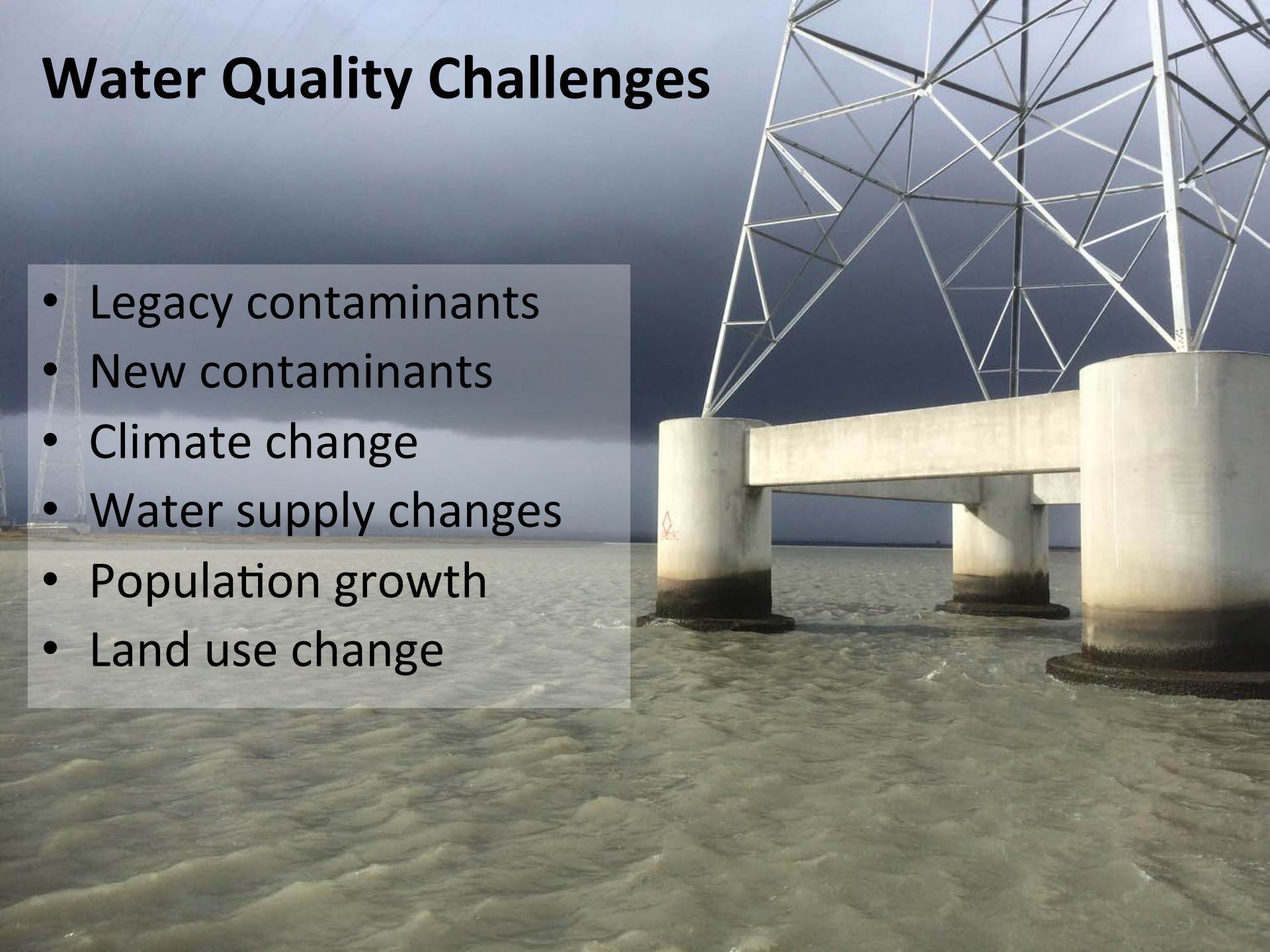# SFEI's Clean Water Program

Program Directors:
Dave Senn
Jay Davis

Water Quality Challenges

- Legacy contaminants
- New contaminants
- Climate change
- Water supply changes
- Population growth
- Land use change

Clean Water Program Goals

- Provide the independent science that is needed to inform water quality management decisions

- Be a catalyst for the region in developing long-term visions of enlightened water quality management
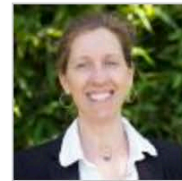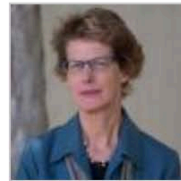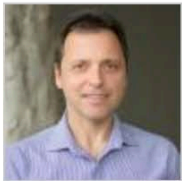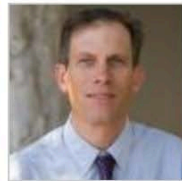
Clean Water Program

Expertise:

- Monitoring program design and implementation

- Environmental engineering and chemistry

- Contaminant fate and transport

- Hydrology and hydrologic modeling

- Hydrodynamic and biogeochemical modeling

- Green Infrastructure

Overview:

- 20 scientists

- Revenue:
    - $3.8M in SFEI labor
    - 20% increase over past 3 years

Management Team:
Dave Senn, Jay Davis, Jen Hunt, Phil Trowbridge
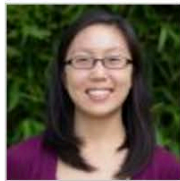
Clean Water Program

Bay RMP	Nutrients	Delta RMP
Watershed Loading	CECs/Green Chemistry	Bioaccumulation
Hydrology and Green Infrastructure	Klamath Basin MP	Russian River RMP
	50 Year Vision	

Bay RMP

- Annual budget: $3.5M
- Leads: Phil Trowbridge and Jay Davis
- Recent Highlights
  - 25th Anniversary
  - Phil Trowbridge
  - New funding streams
- Growth plan: 1 FTE

Delta RMP

- Annual budget: $1.0M
- Leads: Phil Trowbridge and Thomas Jabusch
- Recent Highlights
  - Liftoff!
  - Phil Trowbridge
  - External Review
- Growth Plan: 2 FTE

CECs and Green Chemistry

- Annual budget: $300K
- Leads: Becky Sutton and Meg Sedlak
- Recent Highlights
  - Large increase in RMP funding
  - Moore Foundation funding very promising
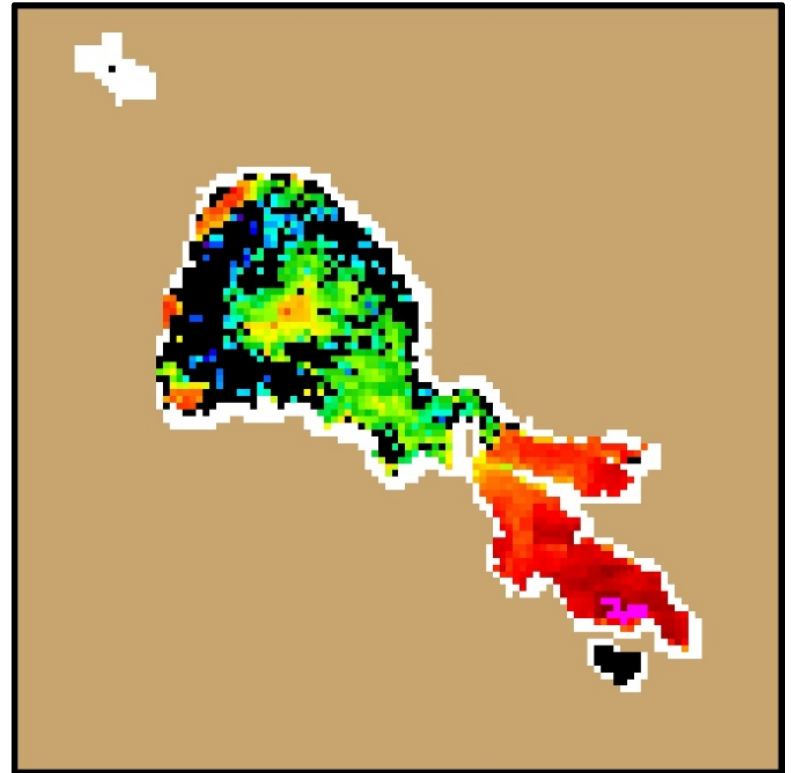- Growth plan: 3 FTE

I just want to say one word to you. Just one word. Plastics.

Bioaccumulation/Freshwater HABs

- Annual budget: $650K
- Leads: Jay Davis, Randy Turner
- Recent Highlights
  - Long-term statewide fish monitoring plan
  - Statewide assessment of freshwater HABs using satellite imagery
- Growth plan: 1 FTE

Russian River RMP

- Annual budget: $100K

- Leads: Josh Collins, Jay Davis

- Recent Highlights

  - Funding for developing governance

- Growth plan: 1 FTE

Clean Water Program

Bay RMP	Nutrients	Delta RMP
Watershed Loading	CECs/Green Chemistry	Bioaccumulation
Hydrology and Green Infrastructure	Klamath Basin MP	Russian River RMP
	50 Year Vision	

What do we need to be doing now to <u>prevent future</u> water quality (and quantity) problems?
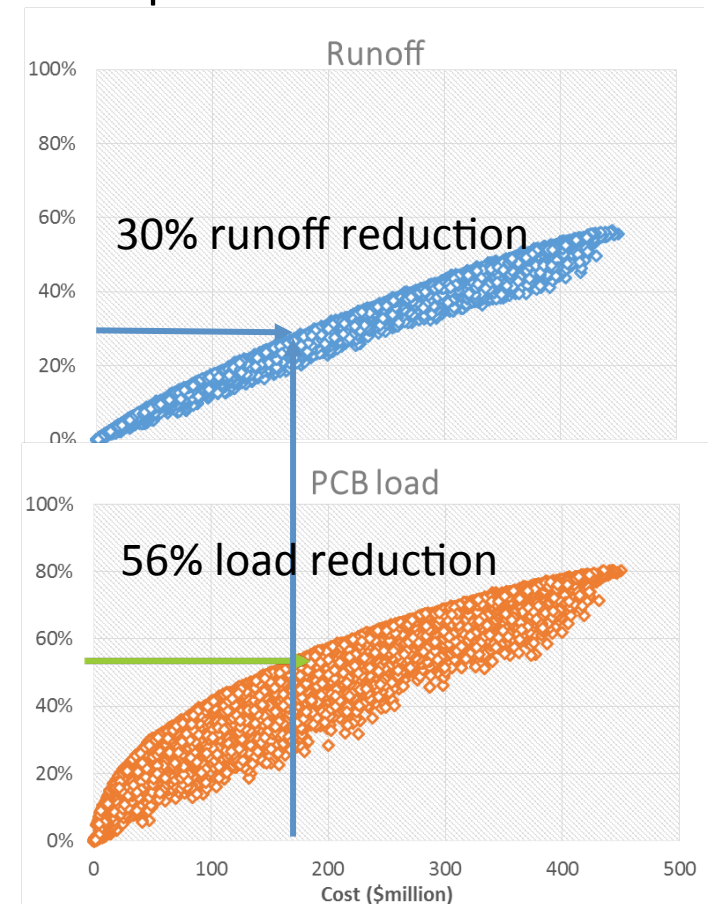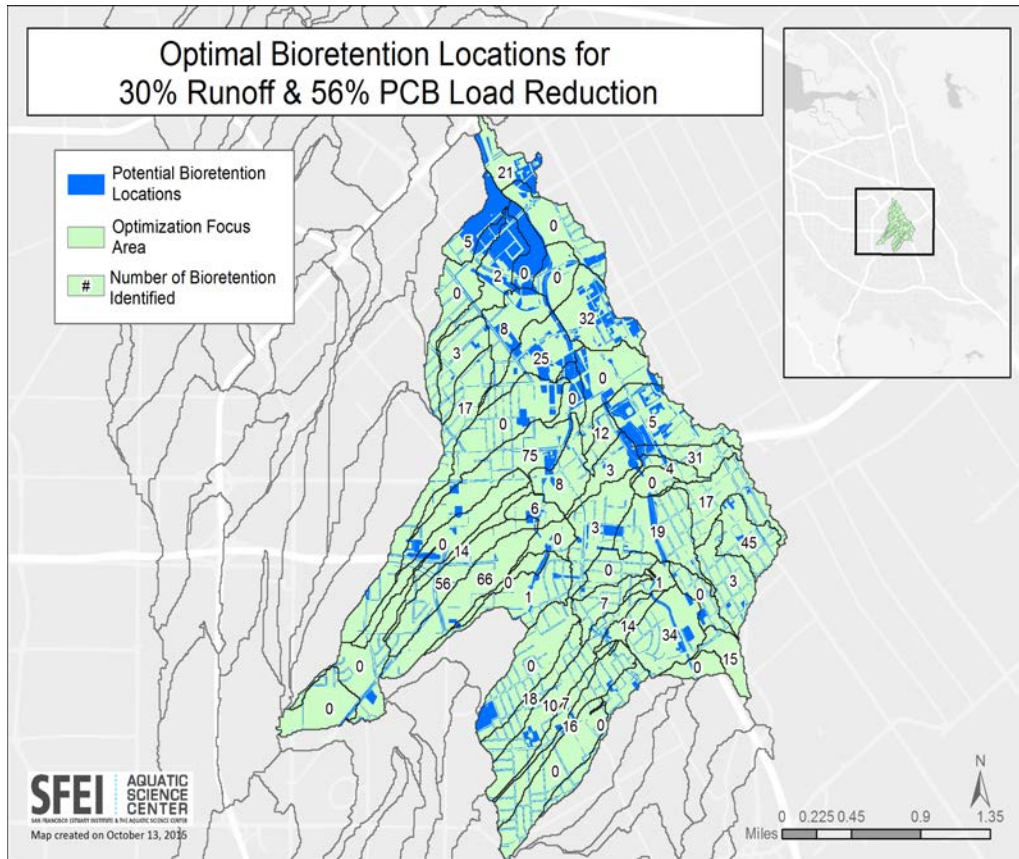
- What are the future water quality problems?
  - What research and monitoring is needed to inform this?

- Can we identify (and follow?) a <u>better</u> path forward to mitigate current problems and minimize future ones?

Watershed Loading

Hydrology and Green Infrastructure

- Annual budget: 500-600k
- Leads: Lester McKee, Jing Wu
- Recent Highlights
  - Successful start to GreenPlanIt
  - 1.5 years left on WQIF #1
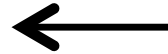 - 2 years on new WQIF #2
- Growth plan: 2 FTE

Optimal Bioretention Locations for 30% Runoff & 56% PCB Load Reduction

30% runoff reduction

56% load reduction

Domoic Acid

(Amnesic Shellfish Poisoning)

Pseudo-nitzchia

Summer 2015

chlorophyll (mg/m³)

0   5.5   30

NOAA Climate/NOAA View

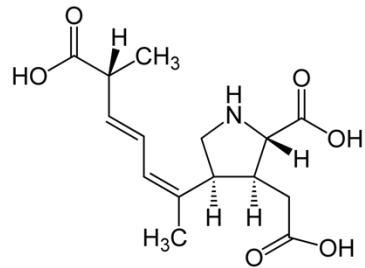Photo: Eric Risberg, Associated Press

News > Environment & Science

# Tests for bacteria in Discovery Bay channels create stir

"Contra Costa County health officials are warning Discovery Bay residents to avoid coming into contact with the water in the area after field tests showed that it contains blue-green algae. The bacteria can cause a variety of ailments, including rashes and other allergic reactions, skin and eye irritation and an upset stomach. Exposure to high levels can lead to serious illnesses and even death, according to the California Department of Public Health."

Nutrients

- Annual budget: $1.5mill

- Lead: Dave Senn

- Recent Highlights
  - Nutrients Observational Network
  - Water quality modeling

- Growth plan: 4 FTE
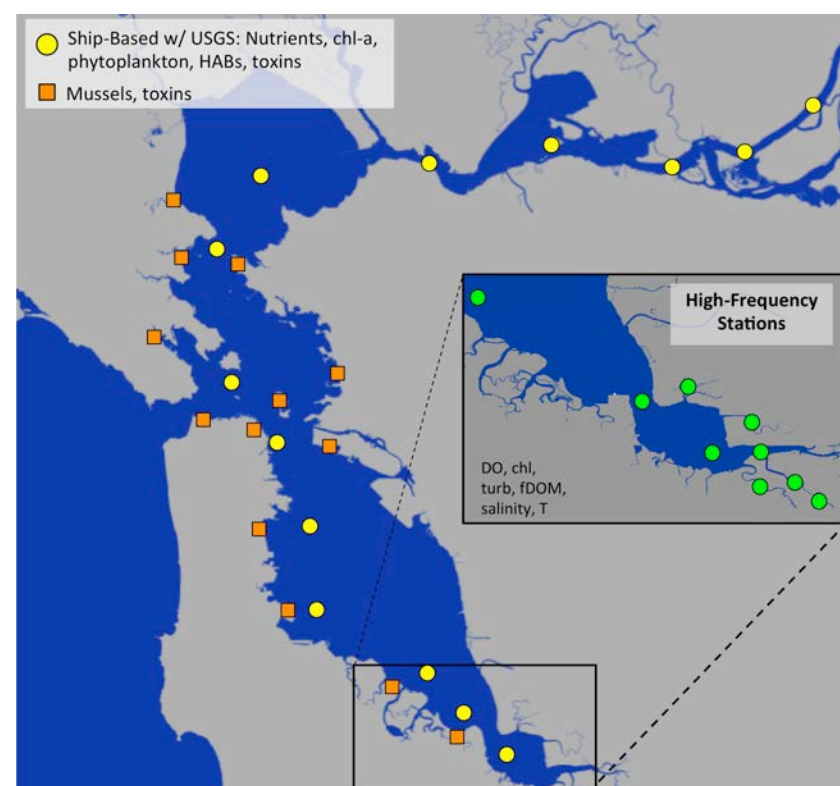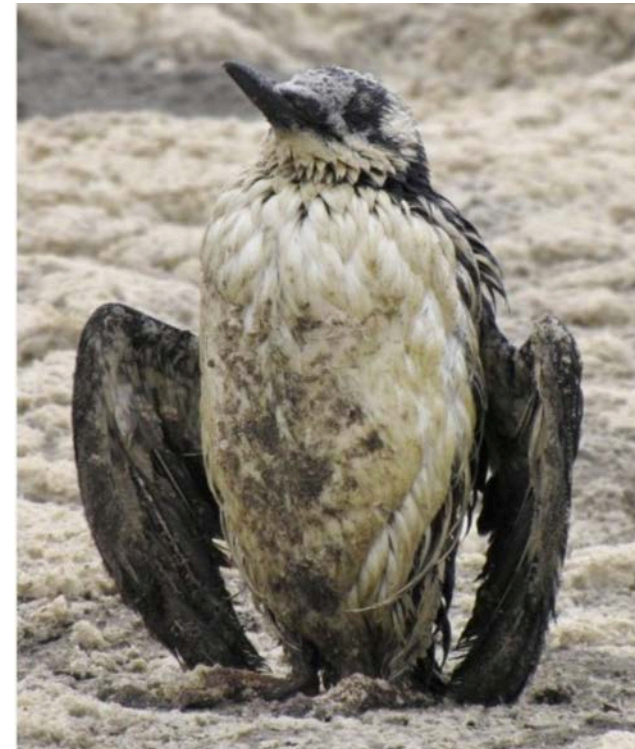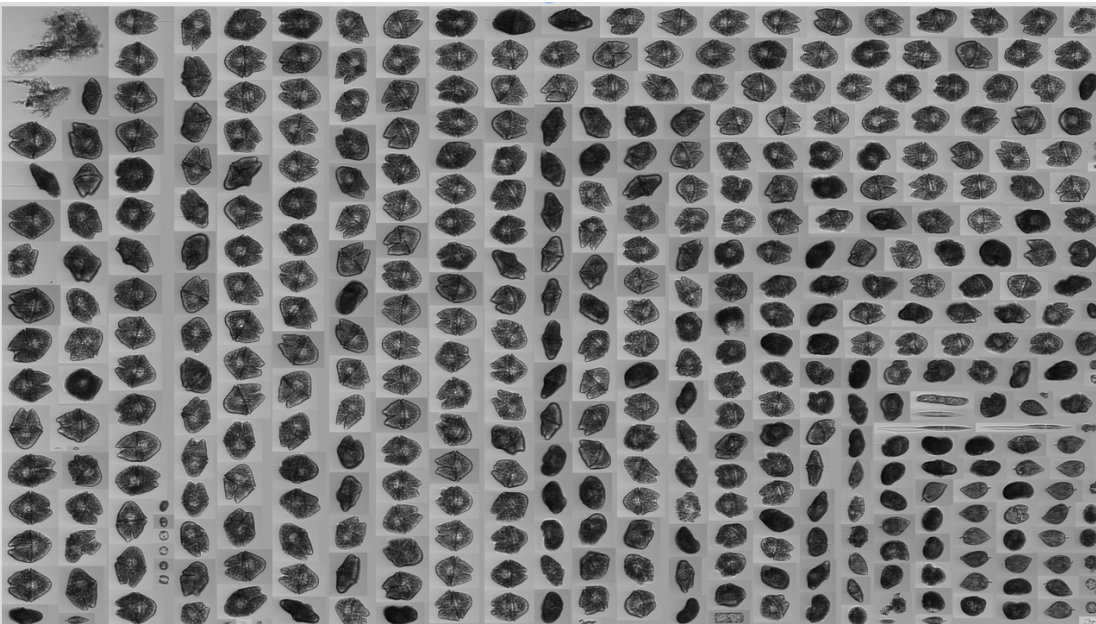

Conservative Tracer Simulations
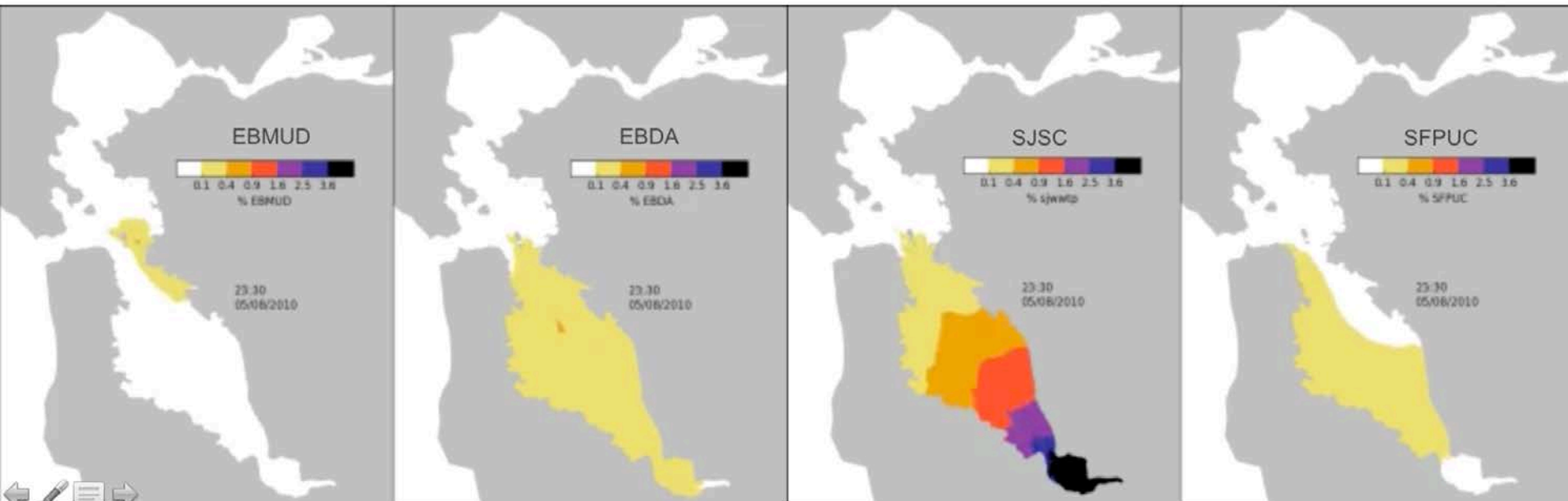
Imaging Flow Cytobot (IFCB)
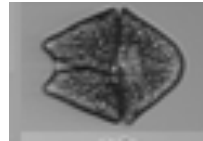
- Counts/identifies phytoplankton down to the genus level.

- Field-deployable (mooring)

- 3-4 samples / hr

- 2 instruments, joint proposal with UC Santa Cruz,

- Deployed as part of San Francisco Bay monitoring program
    - Monthly cruises (first run in October 2016)
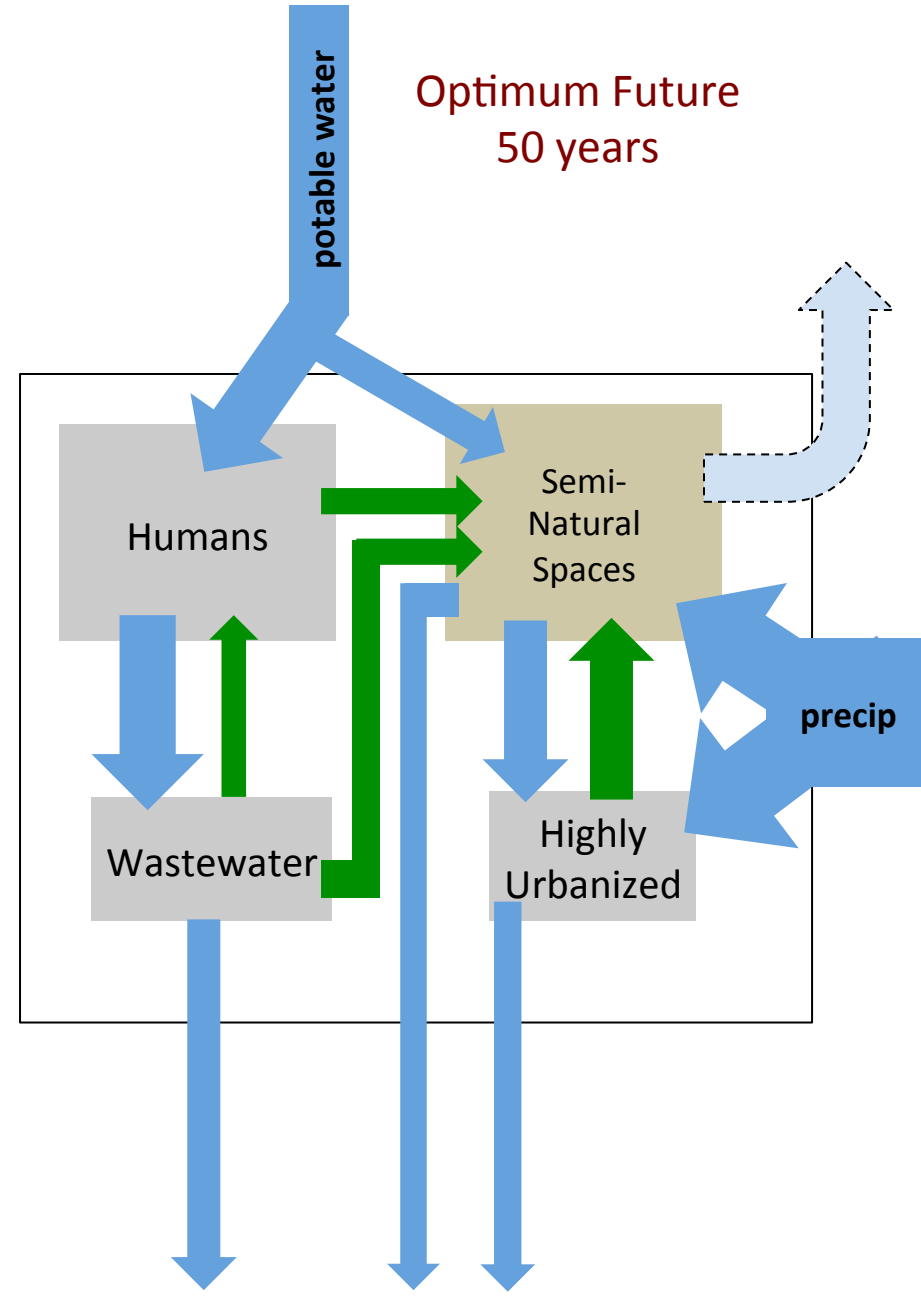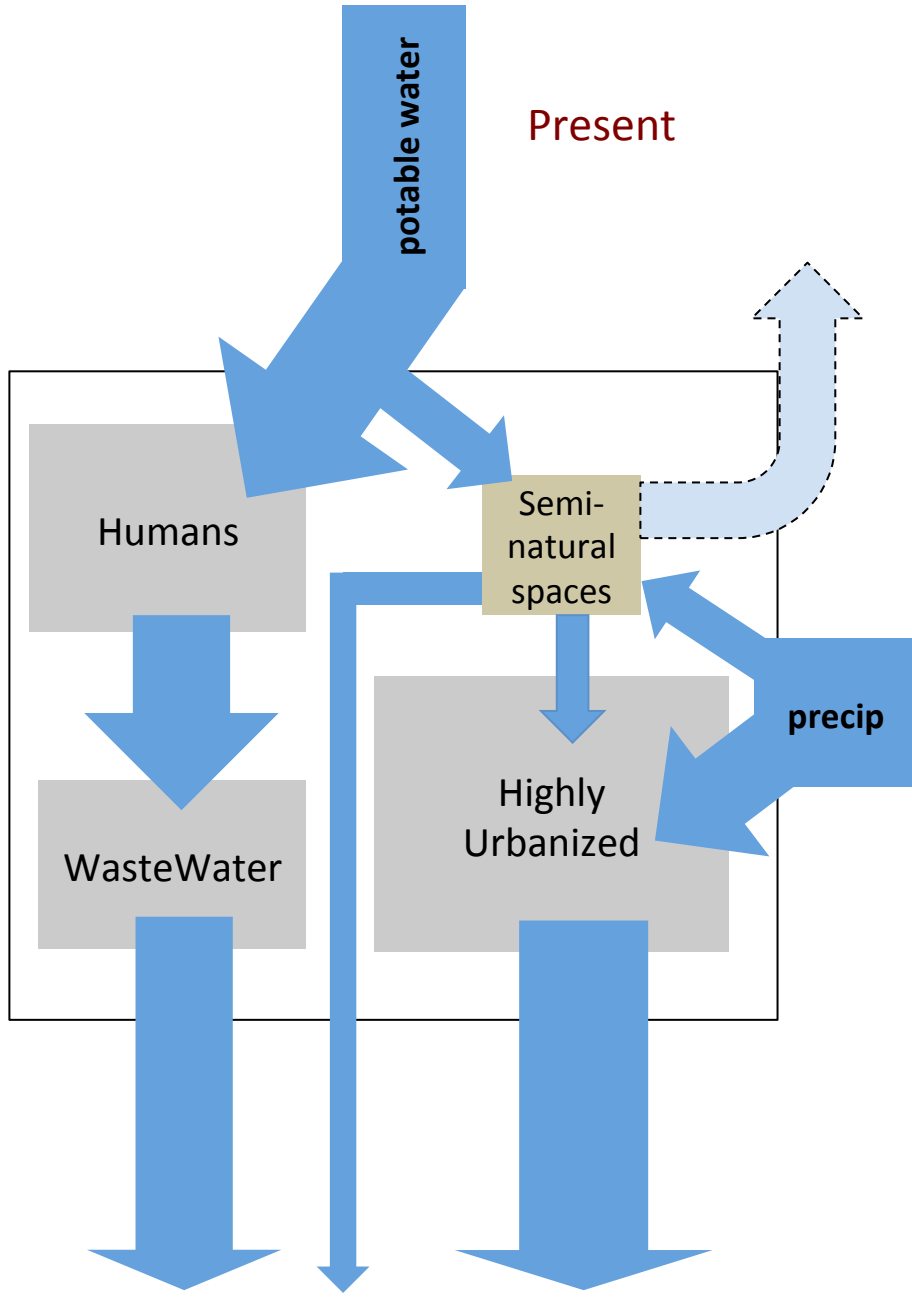   - Deployed at high-frequency site (beginning 2017)

Akashiwa spp.

September 12 2016 – Santa Cruz wharf

What should water resources management look like in the Bay Area in 50 years?

50

40

30

20

10

?

?

?

potable water

Human use

Natural/ semi-natural spaces

precip

Wastewater

Highly developed spaces

Present

50

40

30

20

10

potable water

Human use

Natural/ semi-natural spaces

precip

Wastewater

Highly developed spaces

Optimum future
50 years

Implementation guided by
long-term regional plan

Implementation based on
short-term individual plans

Costly redirection in 20 years

New regulations or incentives

GreenPlan-IT

Developing the 50-year vision will require…

- Interdisciplinary Collaborations/Partners
  - SFEI's current sweetspot
    - Landscapes, Watersheds, Ecology, Water quality, Tools and Data
    - Close tie to regulator and regulated communities
  - Partners: Doers AND Dreamers
    - Applied: Economics, wastewater engineering, policy
    - Basic research

- Diverse funding sources

Clean Water Growth Plan for the Next Ten Years

Focus Area	Added FTEs
Bay RMP	1
Delta RMP	2
Nutrients	4
Watershed Loading	1
Hydrology	1
CECs/Green Chemistry	3
Bioaccumulation/Freshwater HABs	1
50 Year Clean Water Vision	1
Klamath Basin Monitoring Program	0
Russian River RMP	1
Undetermined new focus area	1
TOTAL	**16**

Challenges

- Overall SFEI financial health
  - Core funding
- Maintaining focus while growing
- 50 Year Vision for Clean Water in the Bay Area
  - Clean Water element of the SFEI Adaptation Planning initiative

Klamath Basin Monitoring Program

- Annual budget: $80,000

- Leads: Randy Turner

- Recent Highlights

  - Good work

  - Supportive Region 1

  - Uncertain funding

- Growth plan: 0 FTE