

# BIOMARKERS AND DELTA SCIENCE

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*Delta Stewardship Council*



DELTA STEWARDSHIP COUNCIL

*Biomarkers Workshop*

*UC Davis, October 2013*



**Interagency Ecological Program**

Cooperative Ecological Investigations  
in the San Francisco Estuary since 1970

# BIOMARKERS AND DELTA SCIENCE

A. Delta Science

B. Delta Stressors

C. Biomarkers and the Delta



DELTA STEWARDSHIP COUNCIL

*Biomarkers Workshop*

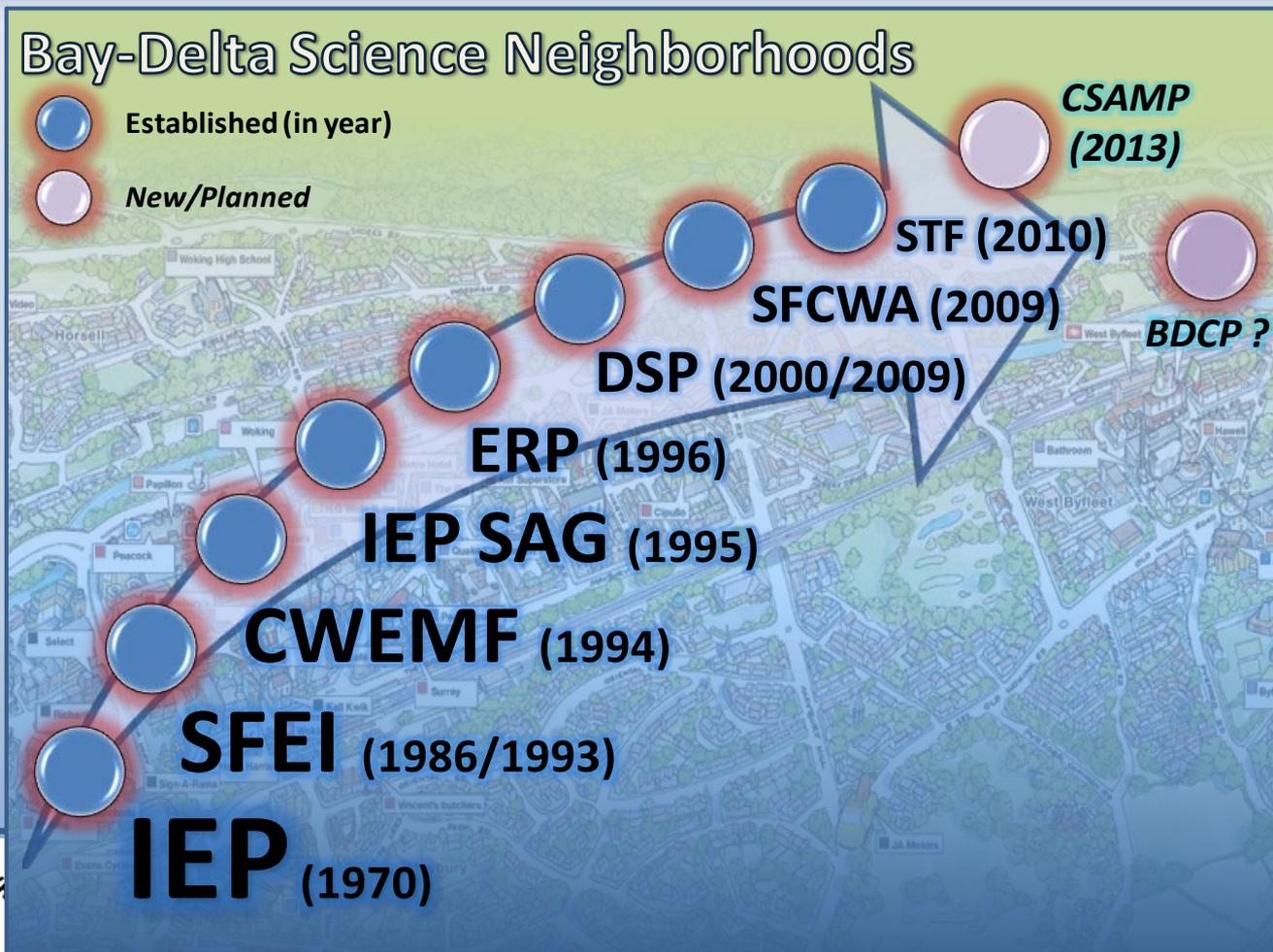
*UC Davis, October 2013*



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# One Delta, Lots of Science!



Cooperative Ecological Investigations  
in the San Francisco Estuary since 1970

# One Delta, One Science



DELTA STEWARDSHIP COUNCIL

Delta Science Program

Proposed Final Draft Delta Science Plan



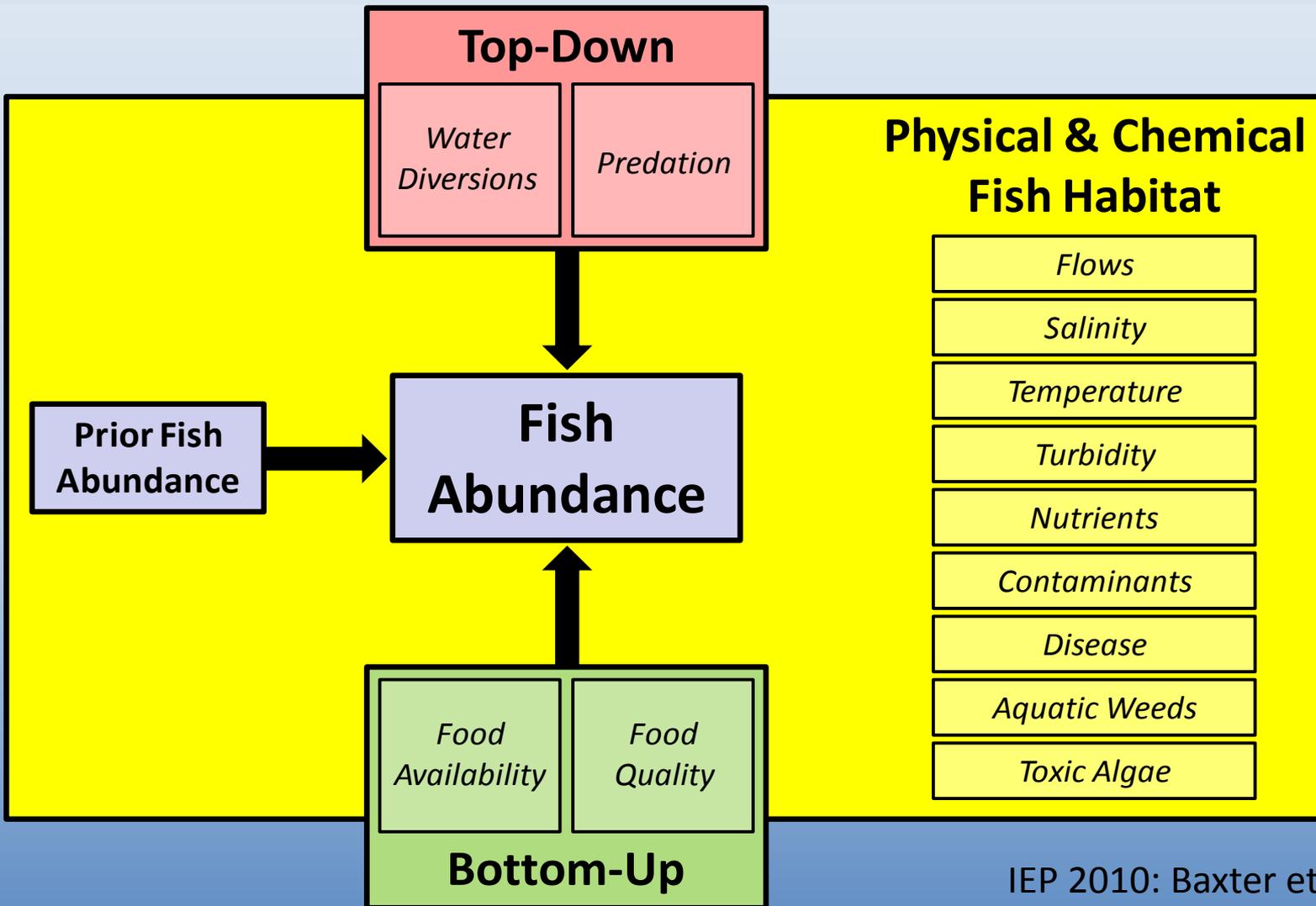
This Plan lays the foundation for achieving a shared vision for Delta science; ***'One Delta, One Science'*** – an open Delta science community that works collaboratively to build a **shared body of scientific knowledge** with the capacity to adapt and inform future water and environmental decisions. The shared body of knowledge includes both natural and social sciences and will be broadly accepted as **credible, relevant, and legitimate**. It will provide a solid scientific basis for making difficult management decisions about the Delta.

*One Delta, One Science*

October 17, 2013

***Next: Interim Science Action Agenda (early 2014)***

# One Delta, Many Stressors

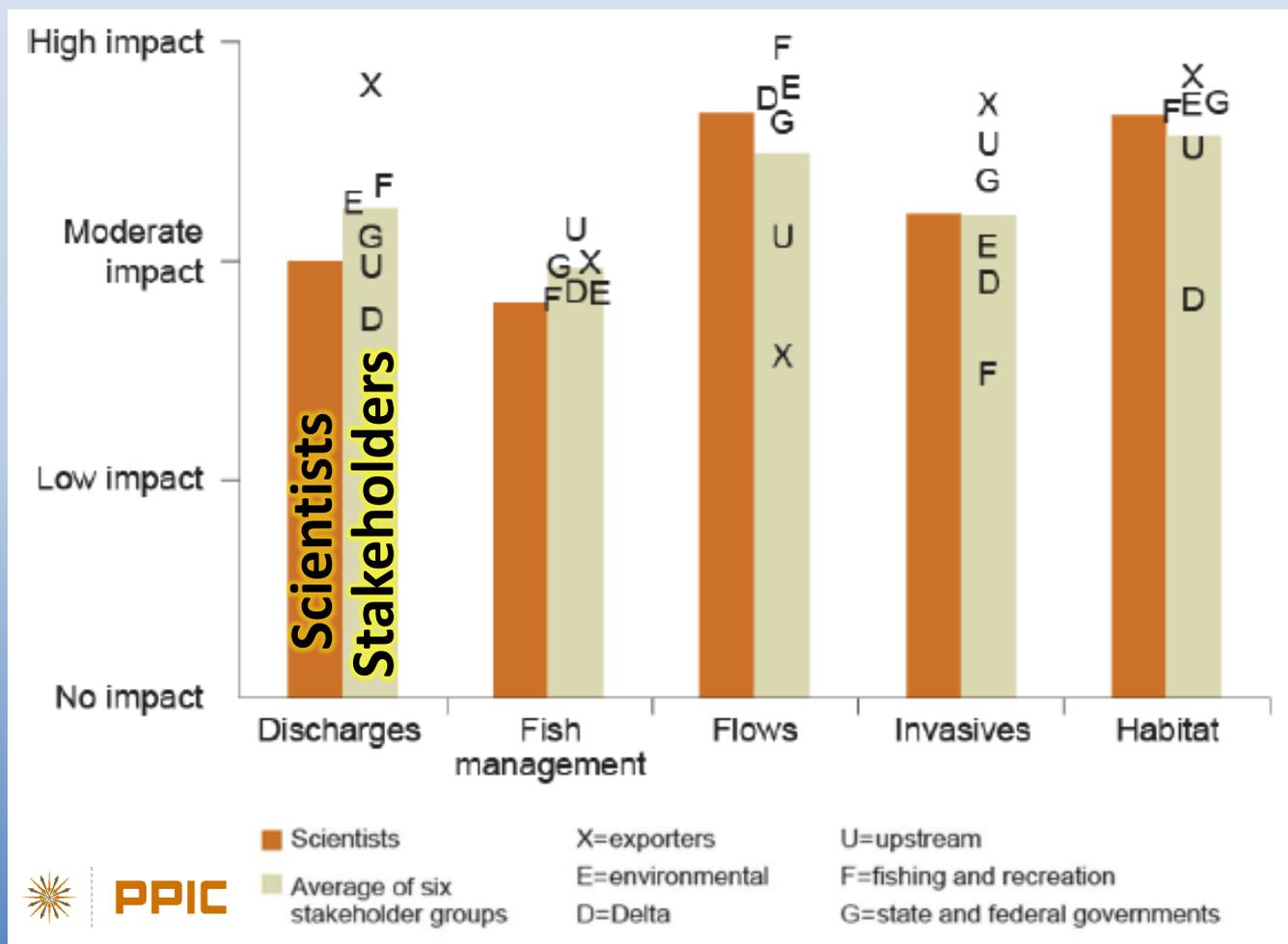


IEP 2010: Baxter et al.  
NRC 2012

Figure in: <http://www.water.ca.gov/iep/docs/FinalPOD2010Workplan12610.pdf>

# One Delta, Many Stressors

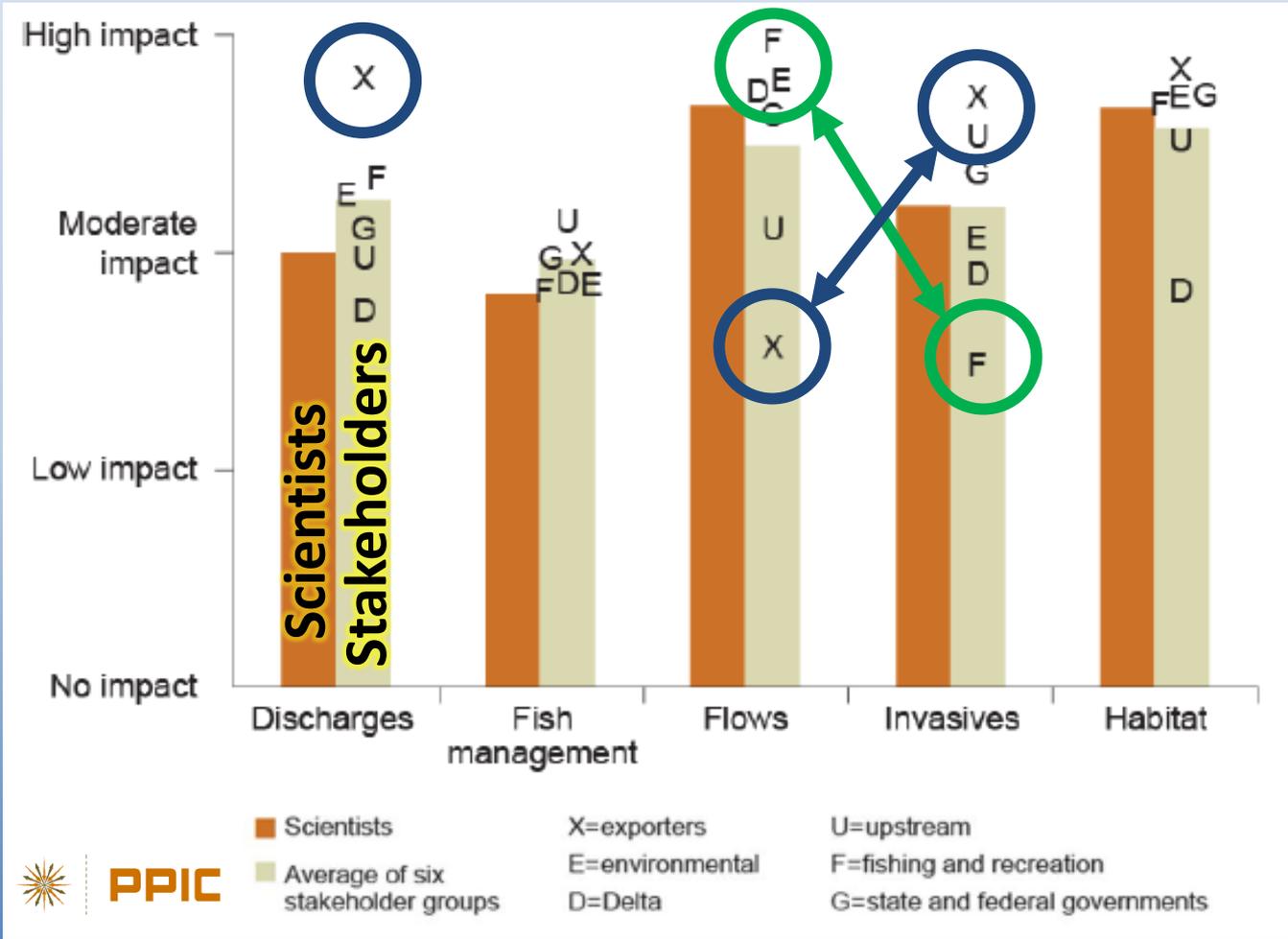
One Science: All have a substantial impact!



PPIC 2013:  
Hanak et al.

# One Delta, Many Views about Stressors

...but “yours” more than “mine”

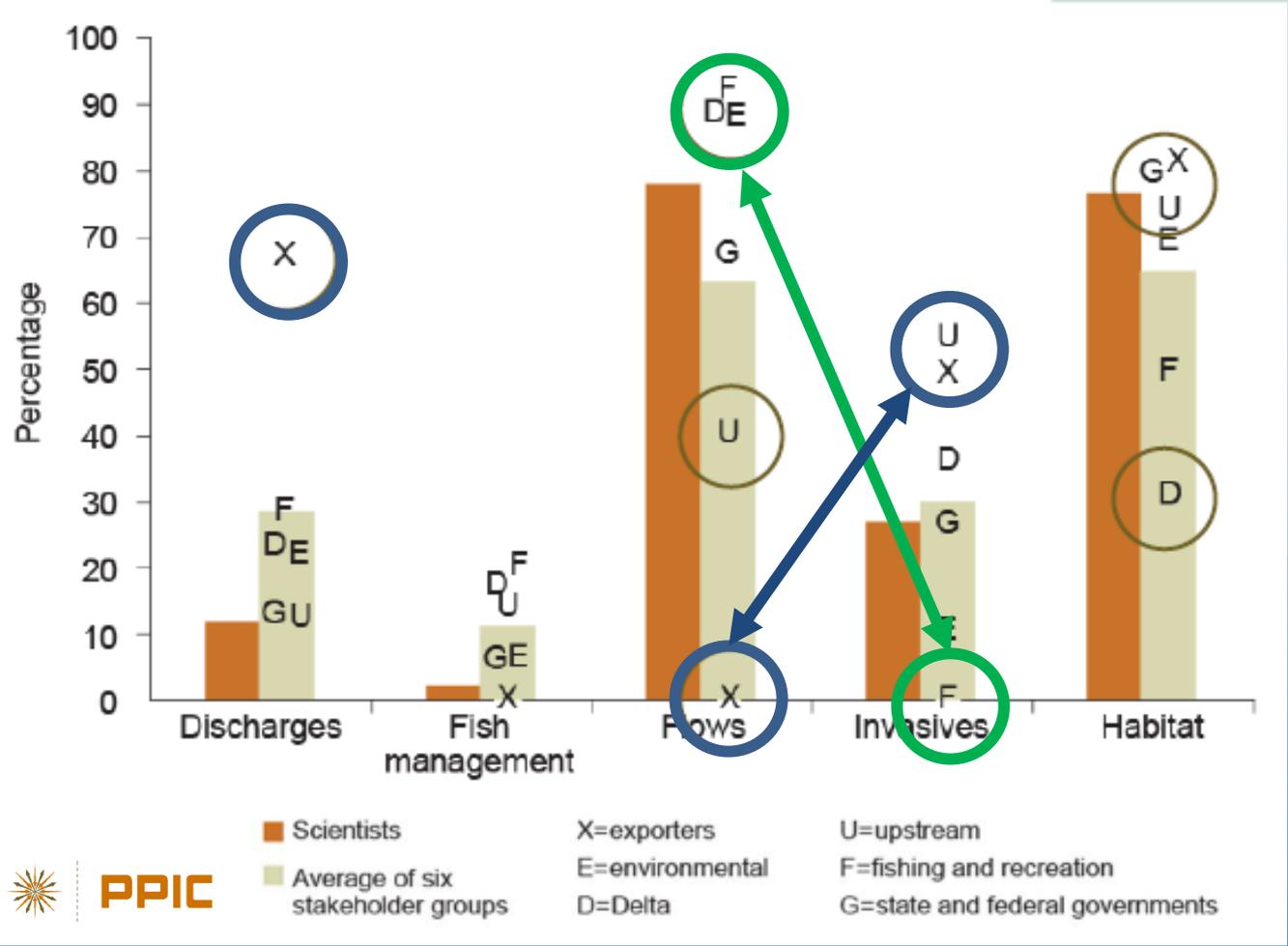


PPIC 2013: Hanak et al.

Figure in: [http://www.ppic.org/content/pubs/report/R\\_413EH2R.pdf](http://www.ppic.org/content/pubs/report/R_413EH2R.pdf)

# One Delta, Many Views about Stressors

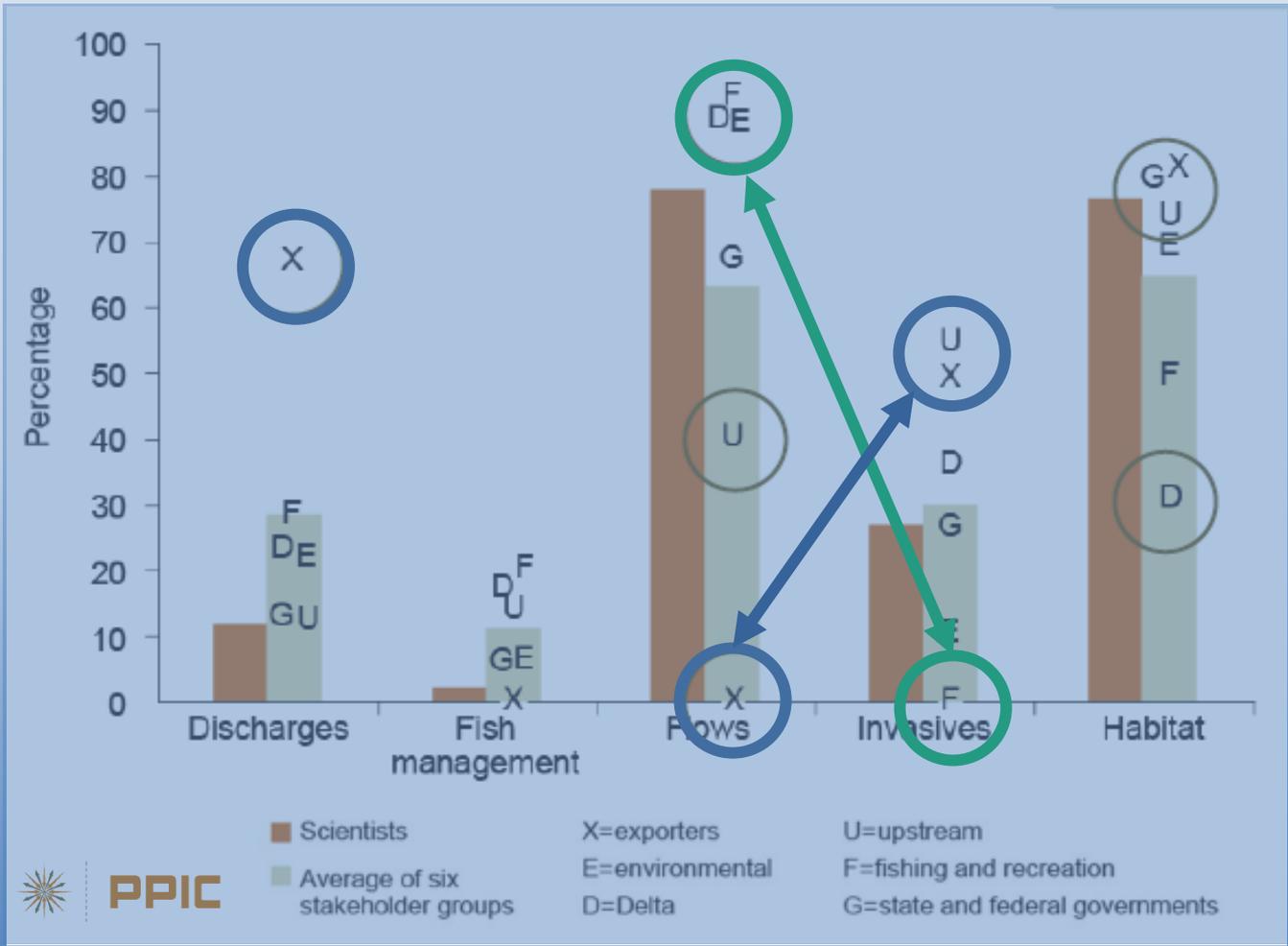
...and "mine" is definitely not among top 2!



PPIC 2013:  
Hanak et al.

Figure in: [http://www.ppic.org/content/pubs/report/R\\_413EH2R.pdf](http://www.ppic.org/content/pubs/report/R_413EH2R.pdf)

# (How) Can Biomarkers Help???



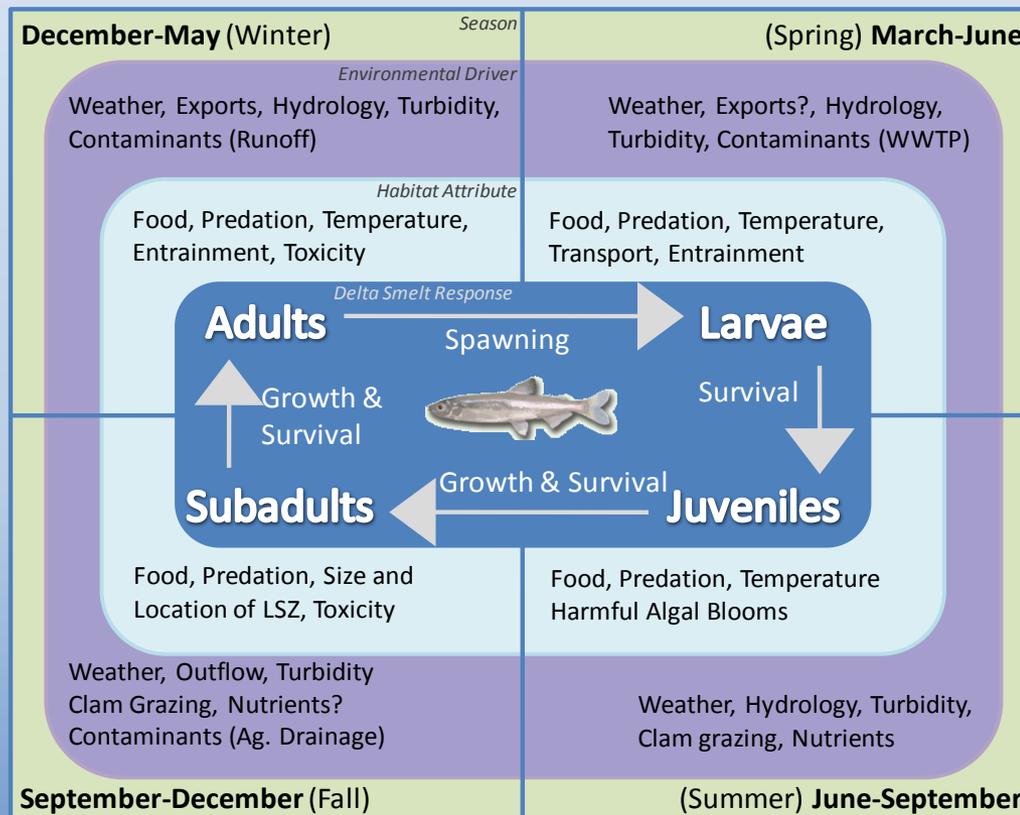
PPIC 2013:  
Hanak et al.

Figure in: [http://www.ppic.org/content/pubs/report/R\\_413EH2R.pdf](http://www.ppic.org/content/pubs/report/R_413EH2R.pdf)

# (How) Can Biomarkers Help?

Make our stressor impact “stories” more

- Complete
- Correct
- Compelling
- “Shared”



IEP 2013: Baxter et al.  
(= DRAFT IEP MAST Report)

# (How) Can Biomarkers Help?

Make our stressor impact “stories” more

- Complete
- Correct
- Compelling
- “Shared”

Improve monitoring

- More information “bang”  
from same dead fish/bugs
- Better integration

Improve AM, Regulations, etc.

- Performance measures
- Indicators
- Criteria

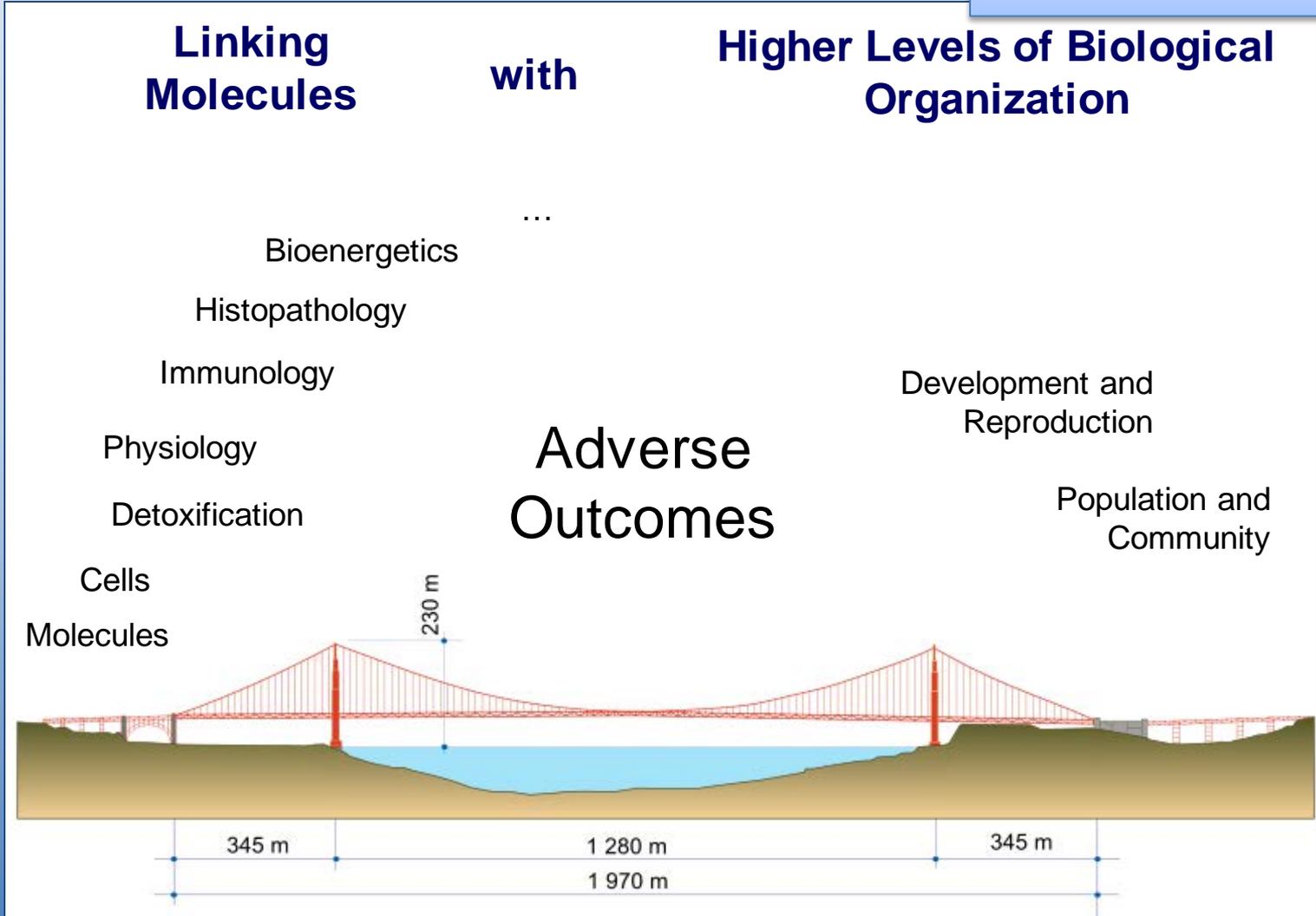


*One Delta, One Science* in action:  
UCD, DFW, BOR scientists working  
collaboratively, Fall 2011

# (How) Can Biomarkers Help?

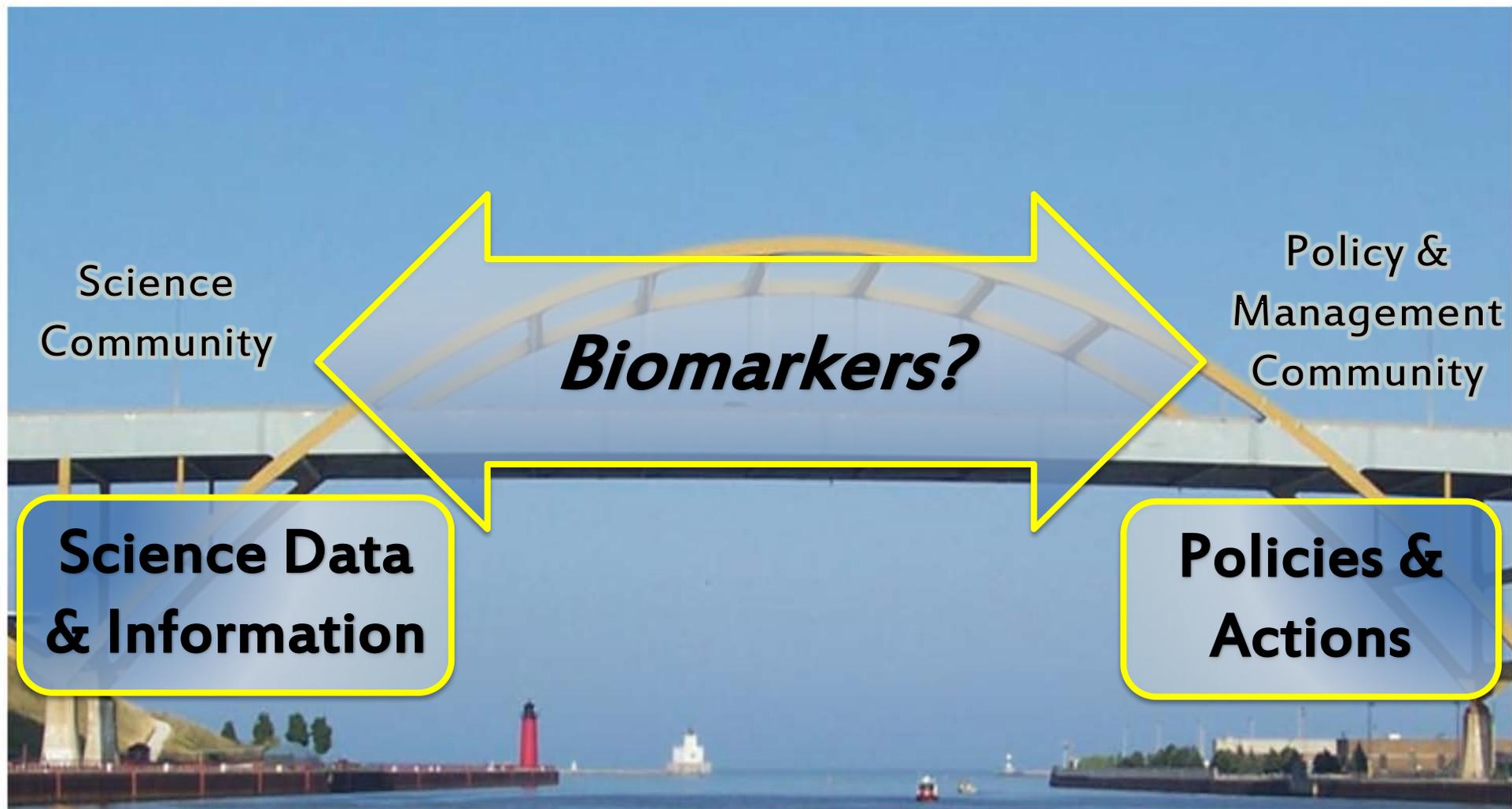
## Build Bridges

*Slide from Richard Connon  
- Thanks!*



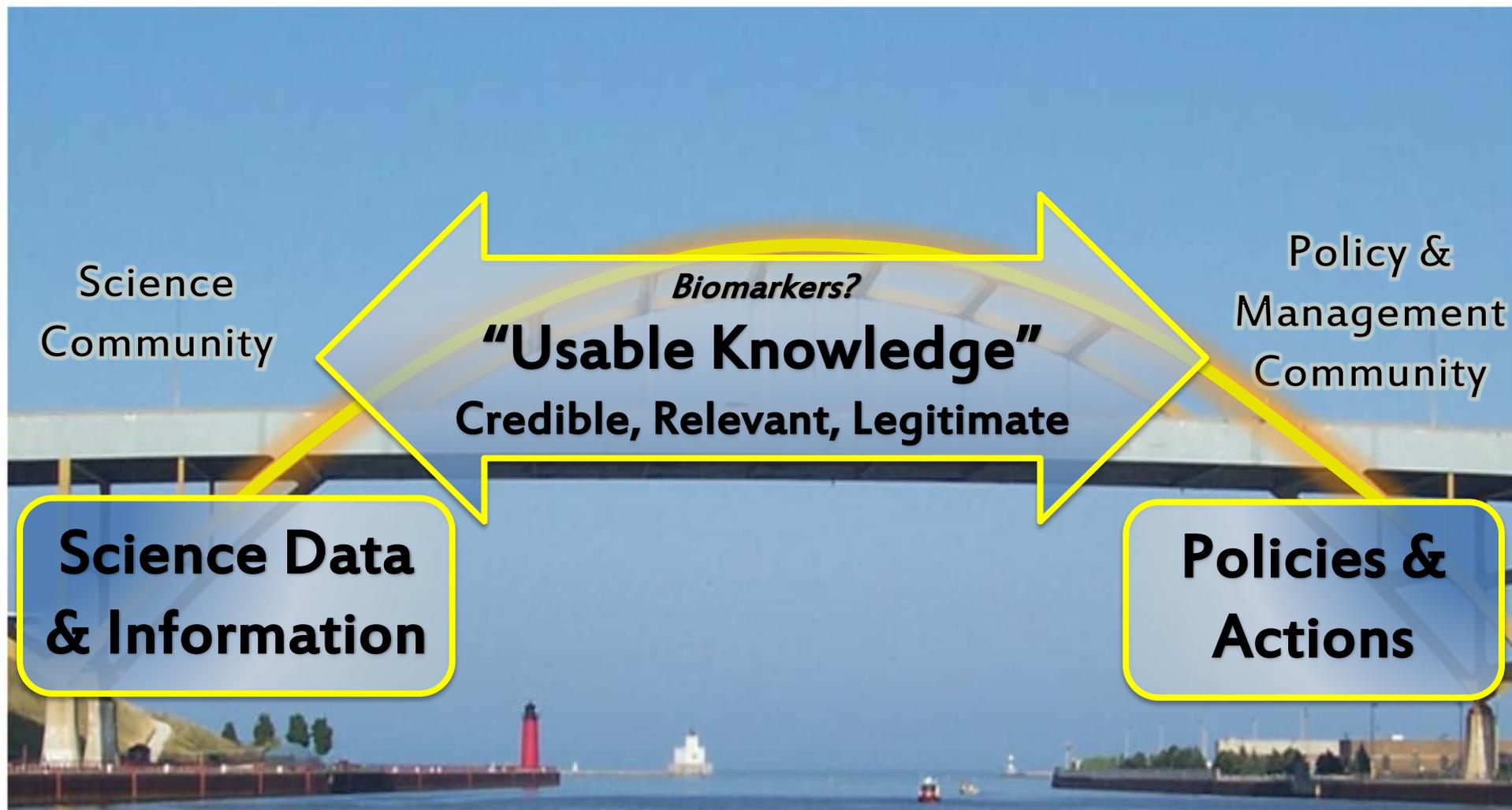
# (How) Can Biomarkers Help?

**Bridge the Science-Policy Gap** (see SFEWS 11/3)



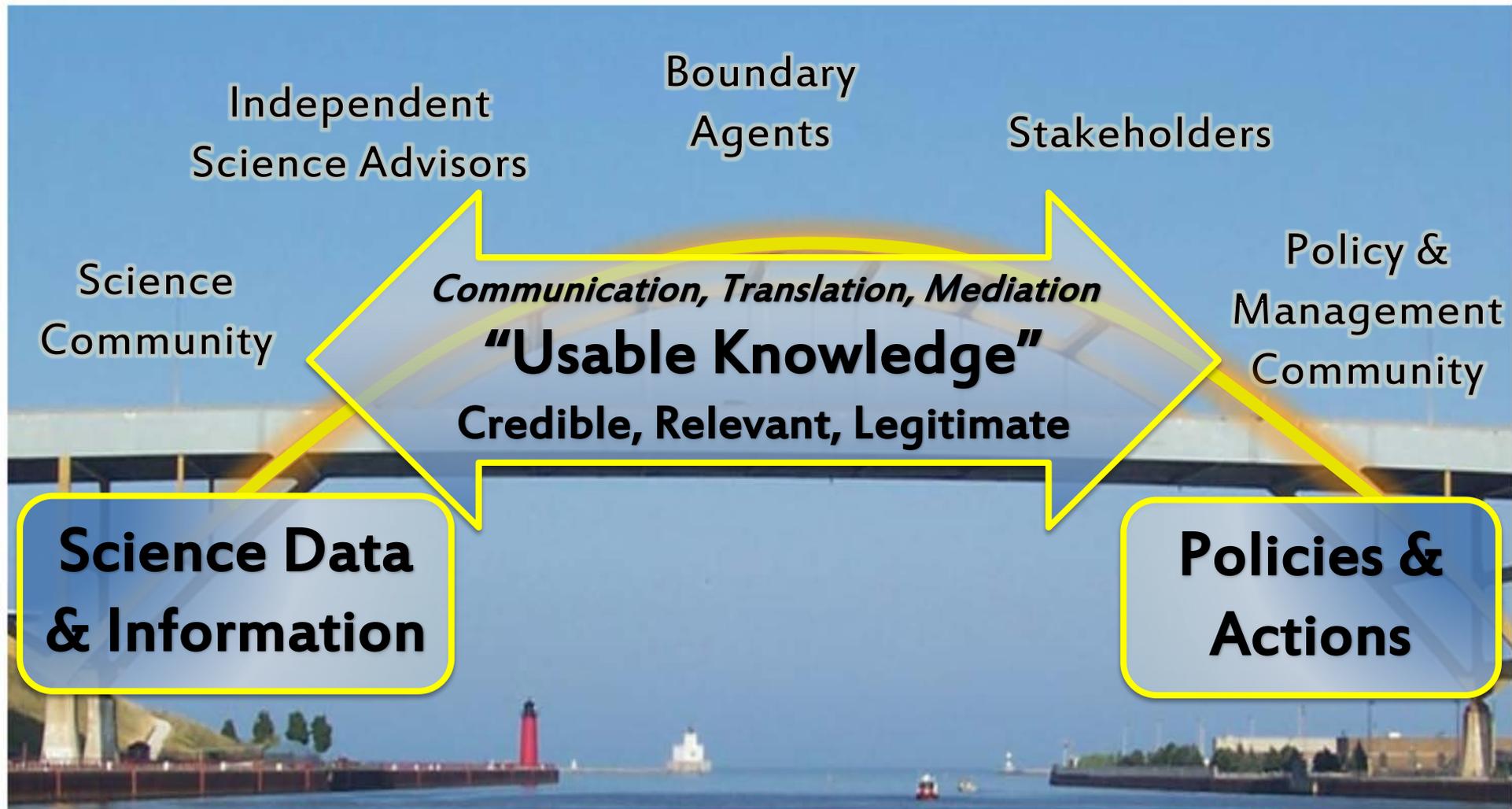
# (How) Can Biomarkers Help?

**Bridge the Science-Policy Gap** (see SFEWS 11/3)



# (How) Can Biomarkers Help?

## Bridge the Science-Policy Gap (see SFEWS 11/3)



# (How) Can Biomarkers Help?

## Build Bridges:

→ Many Challenges, One Comprehensive Approach?

# *One Delta, One Science*



California  
Estuaries  
Web Portal

So,  
NEXT:



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# (How) Can Biomarkers Help?



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*The First (Interim)  
Science Action  
Agenda needs  
**YOUR INPUT!**  
next step: SOE*

*One Delta, One Science*

October 17, 2013

# Thanks!