

## THOUGHTS ON EAWAG

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EAWAG is a unique resource not only for Switzerland but also for the world.

Under Stumm, EAWAG established its reputation for outstanding fundamental studies of environmental systems.

Under Zehnder, EAWAG continued this tradition and also expanded its cutting-edge analytical and field capabilities. The focus of research was sharpened to emphasize AQUATIC systems but also broadened to include SOCIO-ECONOMIC aspects and to address issues in DEVELOPING COUNTRIES.

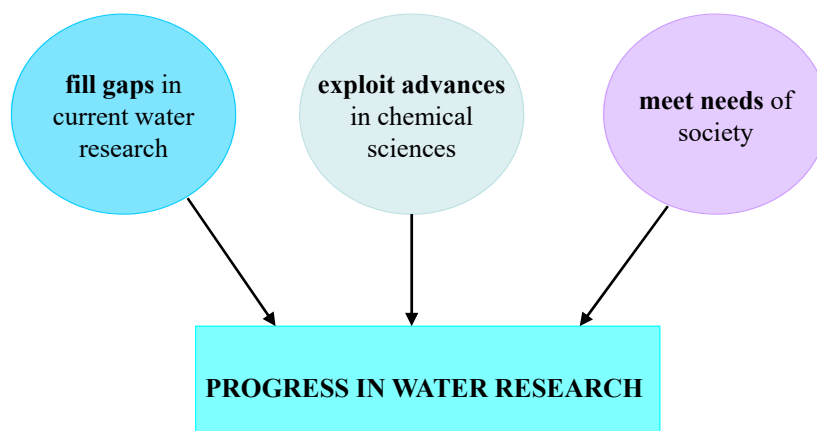
**EAWAG's capabilities = people + facilities**

**→ (unique) opportunities**

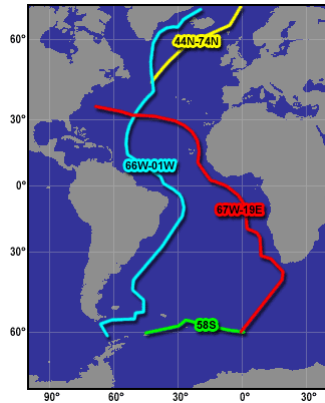
## Goals

- Attract outstanding people.
- Provide environment that encourages excellence and builds synergies.
- Exploit EAWAG's unique capabilities (e.g., rapid response).
- Collaborate with ETHZ and EPFL to train next generation of environmental scientists and engineers.
- Identify and address problems of national and international importance.

## Three approaches to identifying future avenues for advances in water research



### Issue in current water research: sparseness of data



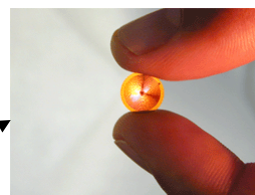
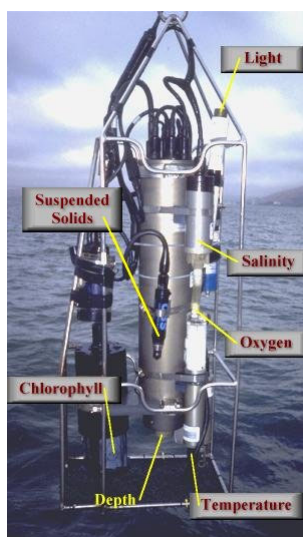
#### GEOSECS SAMPLING

- 66W-01W: 61 stations
- 44N-74N: 10 stations
- 61W-19E: 28 stations
- 58S: 11 stations
- measured parameters:  
temperature, salinity, oxygen,  
phosphate, silicate

*Heroic efforts yet so incomplete*

Java OceanAtlas  
[http://odf.ucsd.edu/joa/reid\\_data/nodcsd2/ATL/EDU\\_\\_SET.ATL/map\\_geosecs\\_atl.html](http://odf.ucsd.edu/joa/reid_data/nodcsd2/ATL/EDU__SET.ATL/map_geosecs_atl.html)

### Research needs: sensor technology



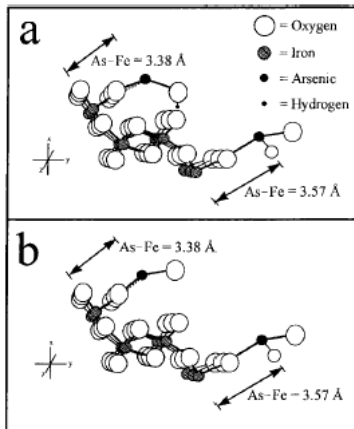
#### Desired characteristics

- multiple parameter sensitivity
- robust
- self-calibrating
- data-logging or linking
- inexpensive

<http://sfbay.wr.usgs.gov/access/wqdata/overview/measure/ctd/>

Implantable Blood Pressure and Flow Sensor  
[www.atdco.org/news/january282002.html](http://www.atdco.org/news/january282002.html)

### Issue in current water research: need for integration across scales



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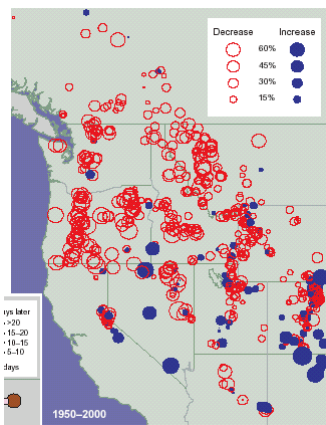
As(III) surface complexes on (110) plane of goethite

Chesapeake Bay

Manning et al. (1998) *ES&T*, 32: 2383.

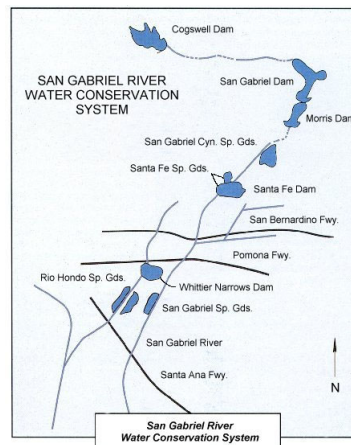
<http://www.cirla.org>

### Societal needs: water conservation and re-use



Reduction in snowpack 1950-2000

Service (2004) *Science*, 303: 1124.

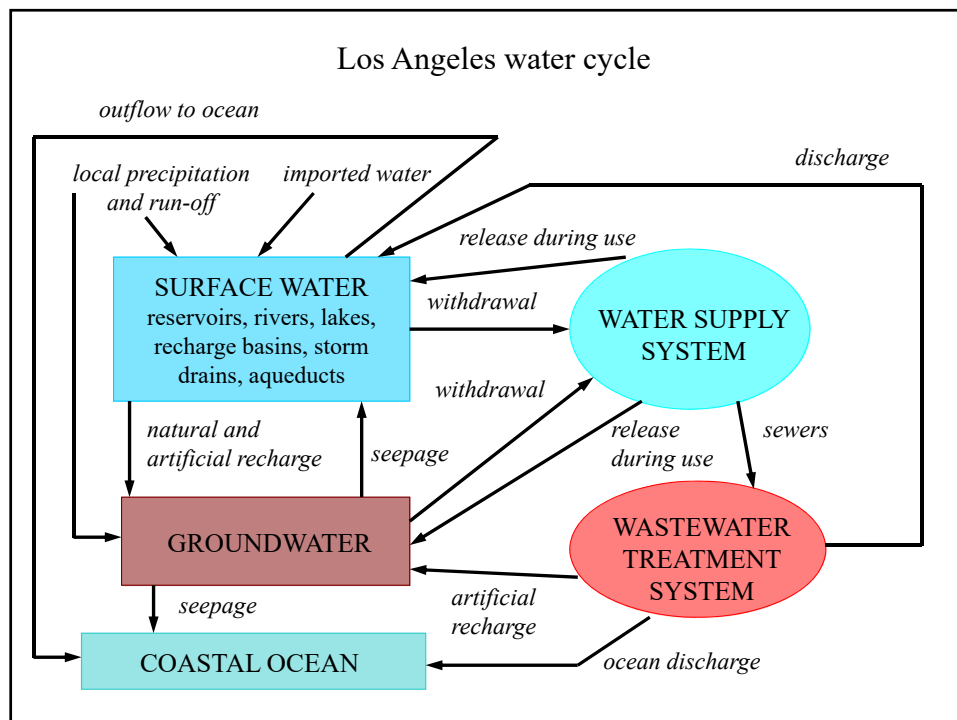
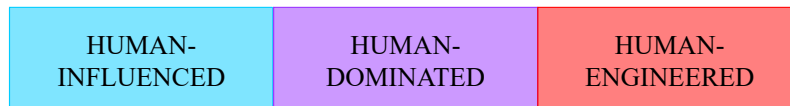


2000-2001 acre-ft spread in LA county	
storm runoff	144,599
imported water	58,448
recycled water	46,343

<http://ladpw.org/wrd/publication/system/index.cfm>

### Natural vs. engineered systems: a false dichotomy

- Impact of human activities is global and not limited to (deliberately) engineered systems.
- Human beings are part of the biosphere, not separate from it.
  - ⇒ other species also cause global-scale effects
  - ⇒ other species also produce engineered artifacts
  - ⇒ human species has agency, consciousness of our actions and their effects
- Alternative view: continuum



## First steps.....

### Learn

- (more) about EAWAG
- about ETHZ and EPFL
- about Swiss environmental issues

### Identify

- needs and opportunities
- future directions

### Build

- new capabilities (people & facilities)

