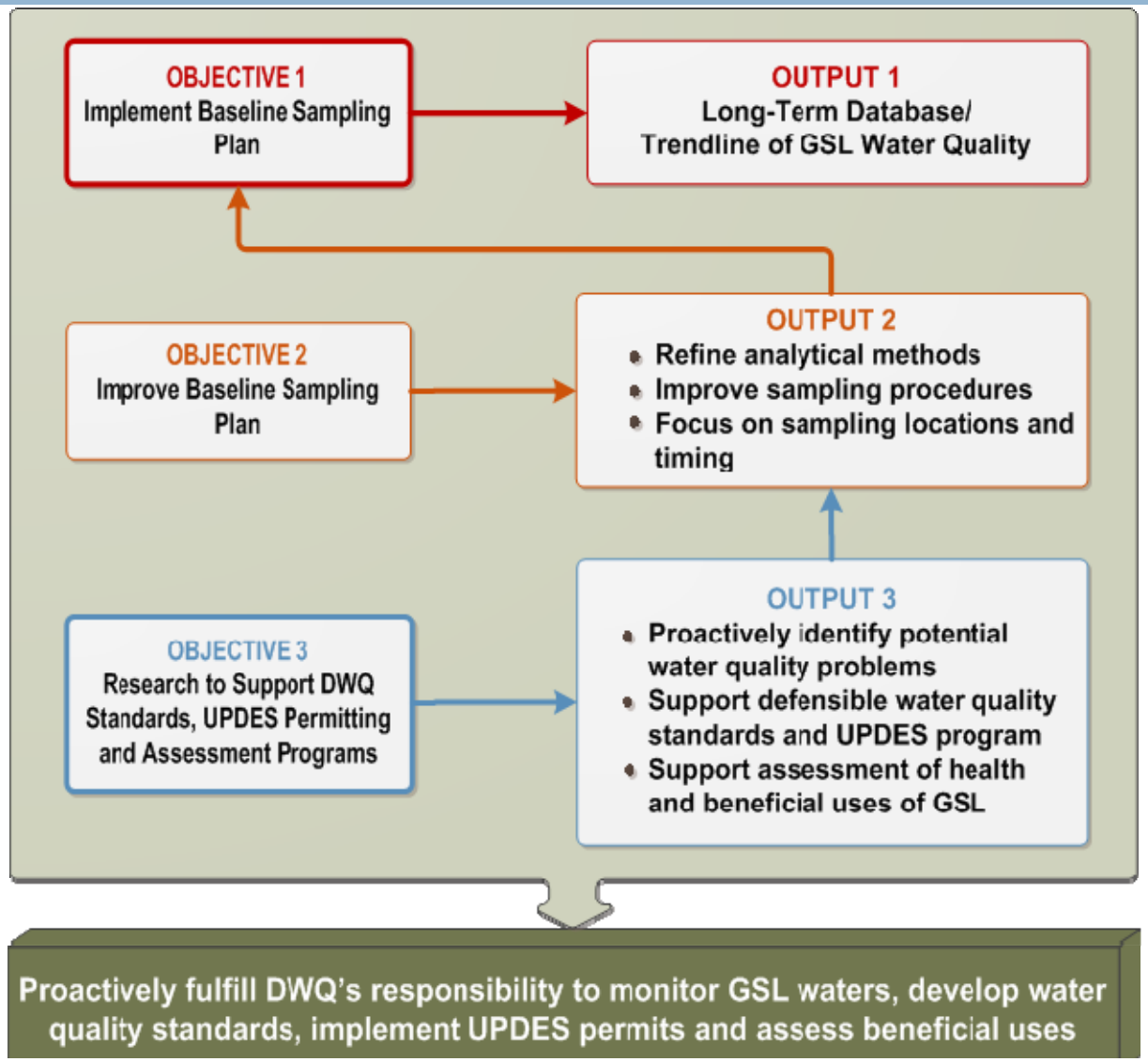
PROTECTING GREAT SALT LAKE: STRATEGIC MONITORING AND RESEARCH

Photo courtesy of Charles Uibel, greatsaltlakephotos.com

Utah Department of Environmental Quality/ Division of Water Quality (UDWQ)

Great Salt Lake Water Quality Strategy

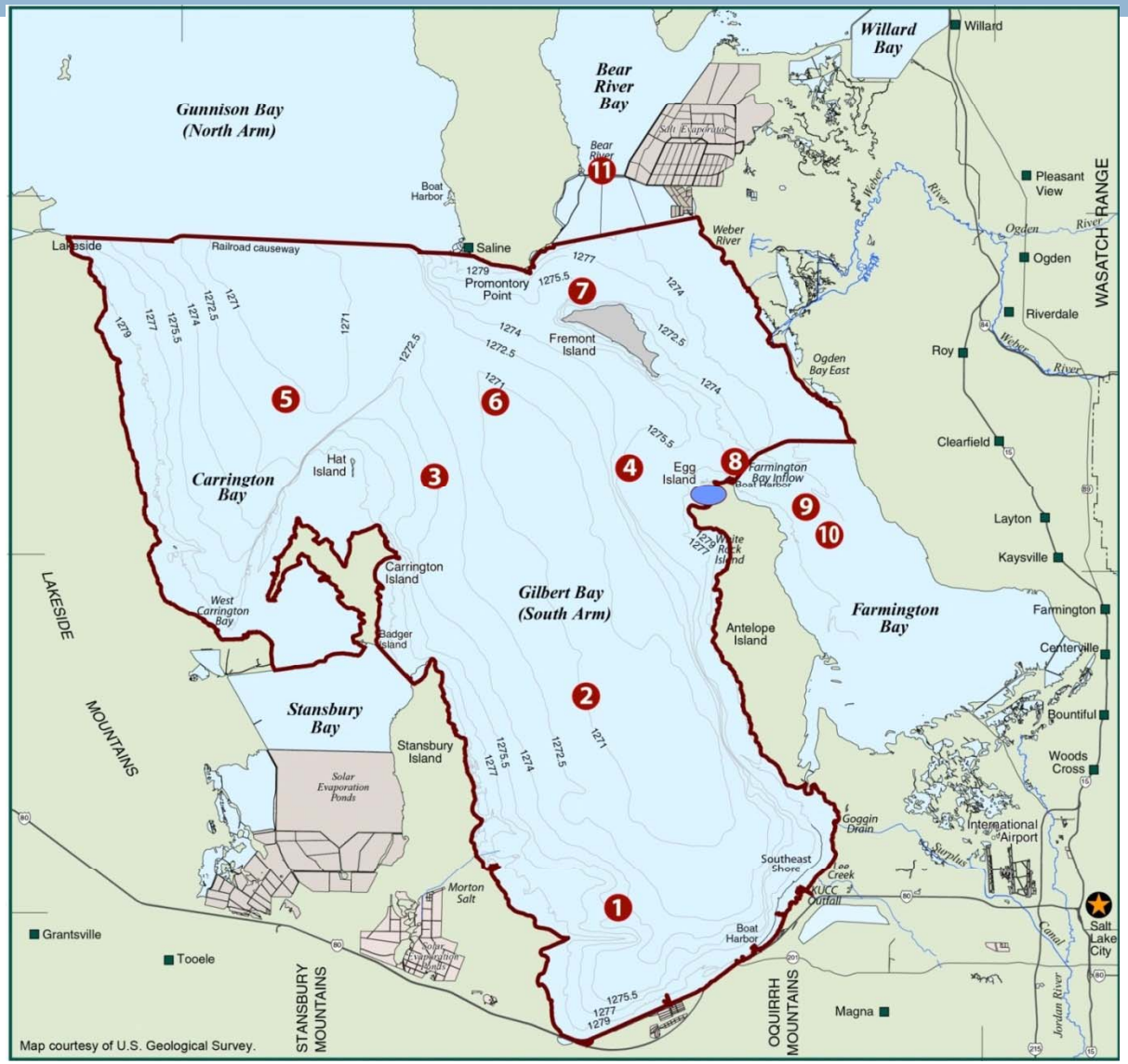
Strategic Monitoring and Research Plan



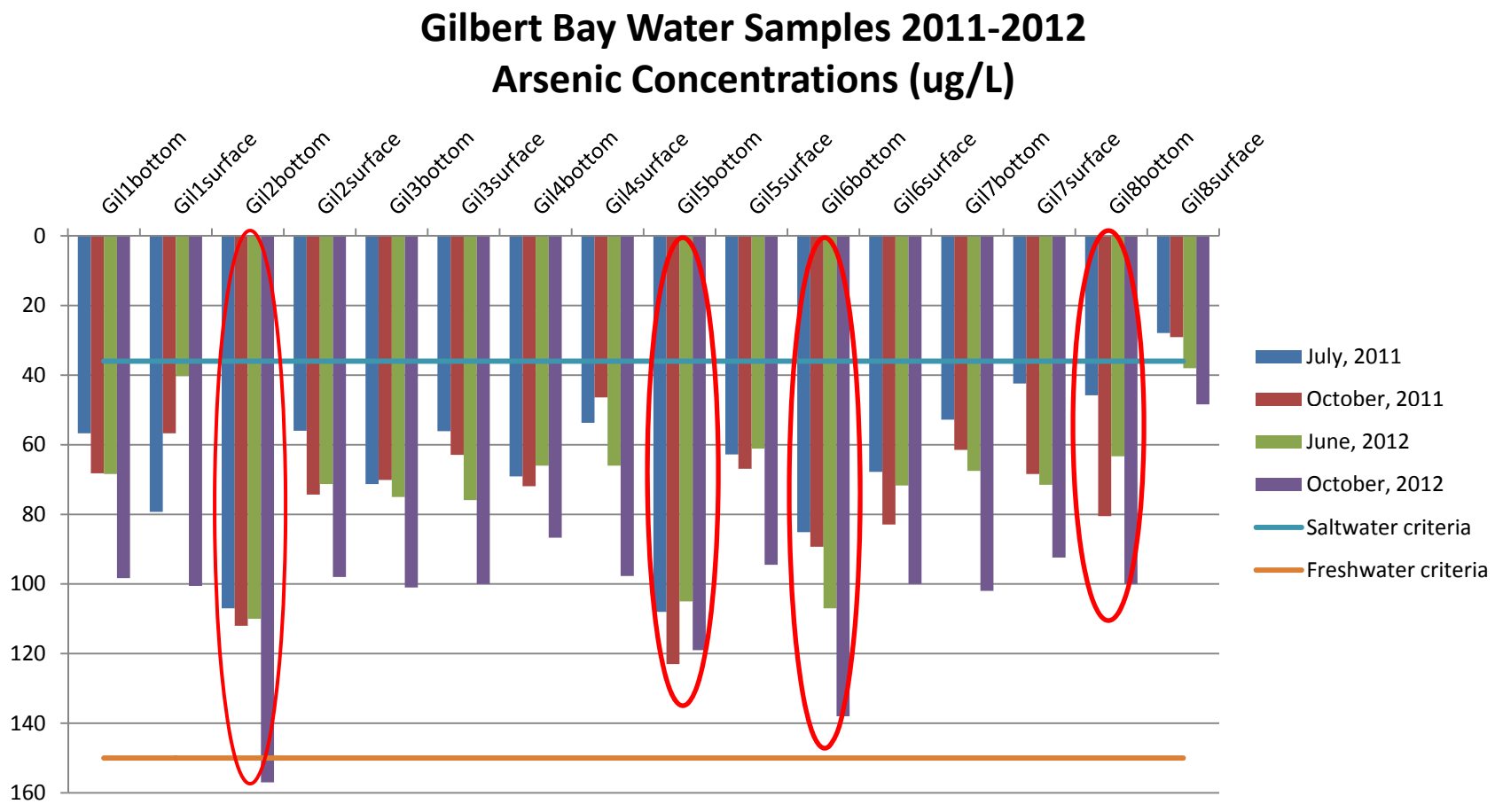
How are we going to use the data?

- Monitor the waters for the protection of the designated uses
- Prioritize pollutants for the development of numeric water quality criteria
- Ambient concentrations for the development of UPDES permits

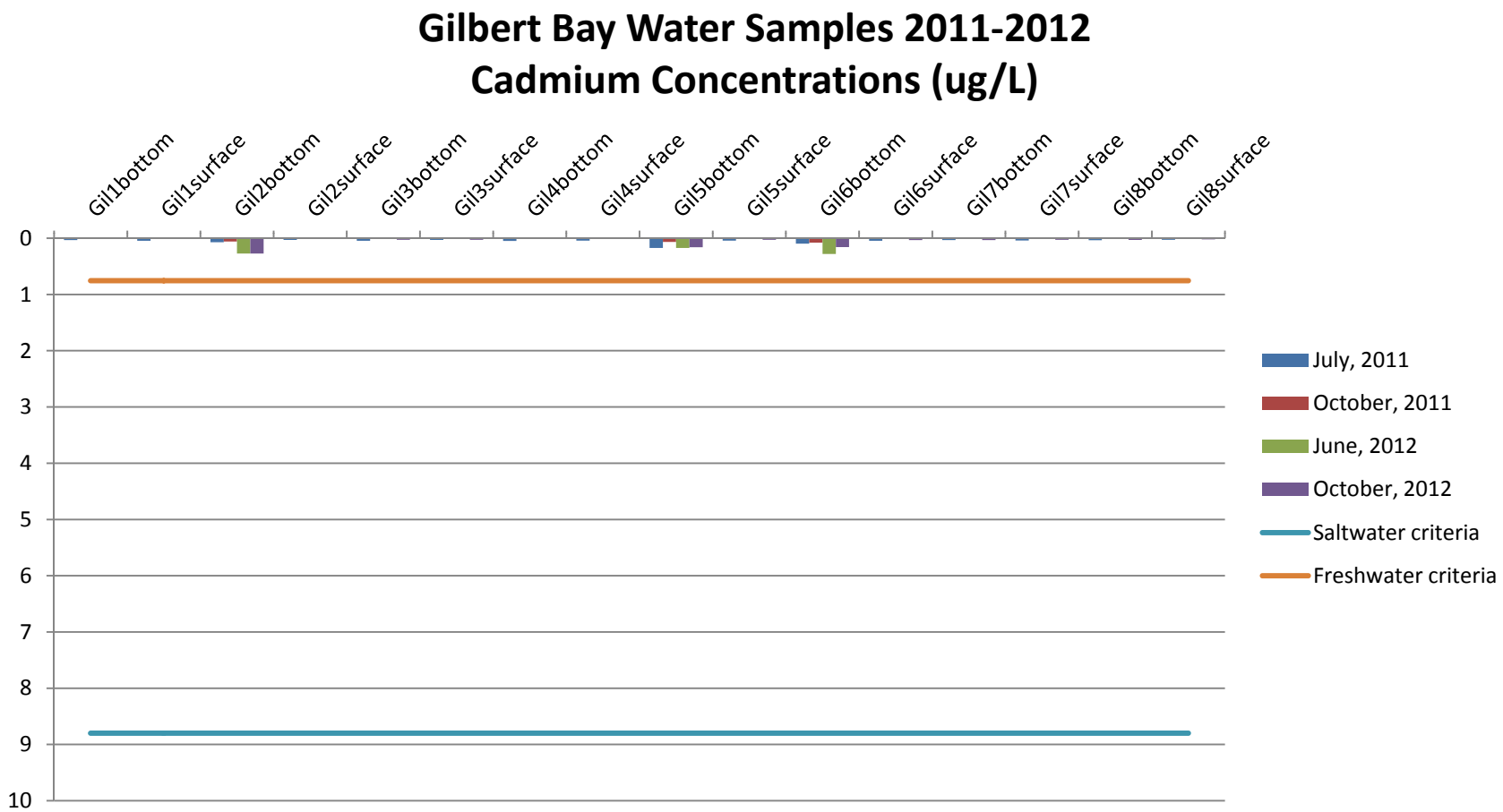
UDWQ Monitoring Locations



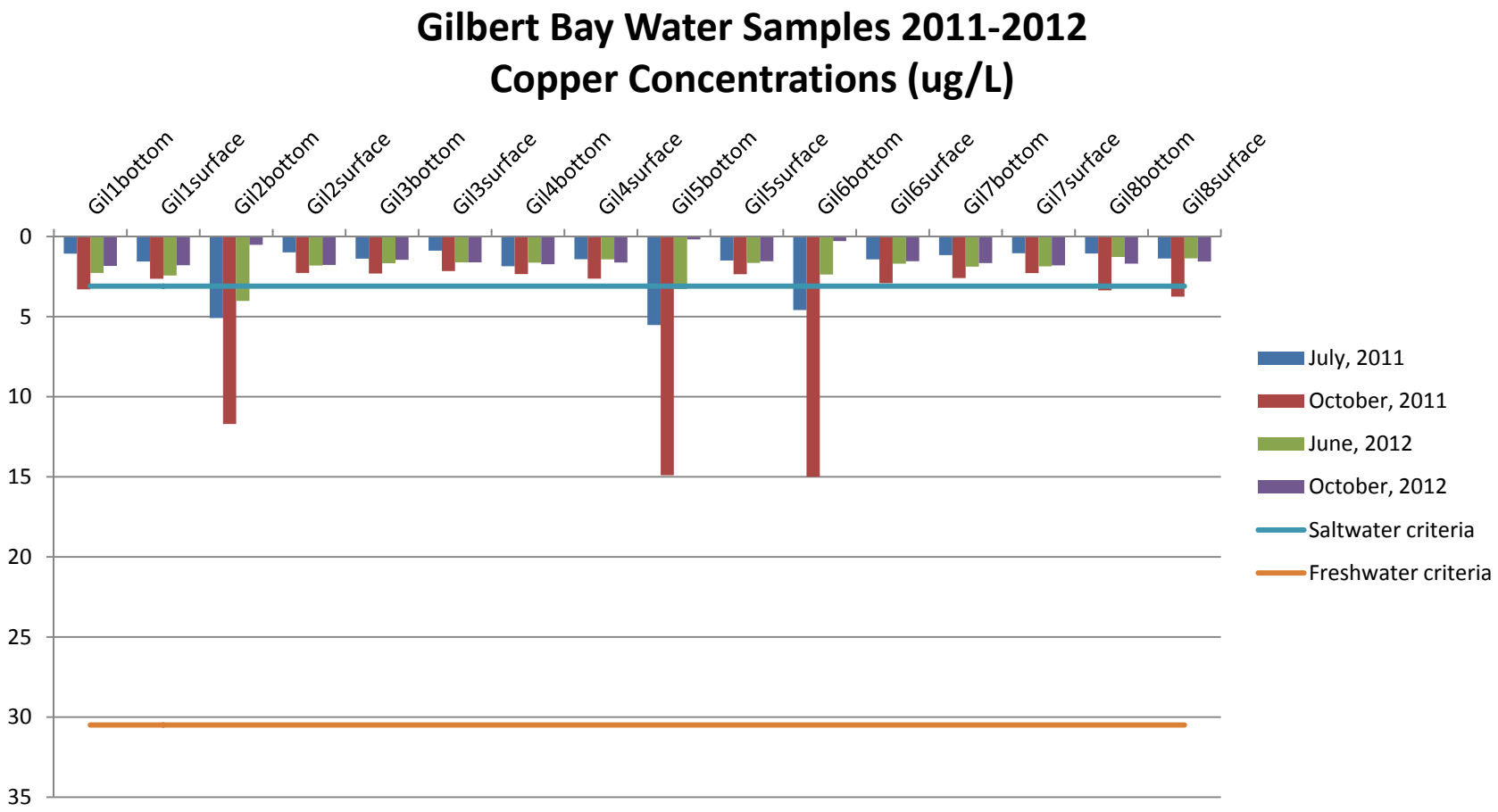
Arsenic Concentrations in Gilbert Bay



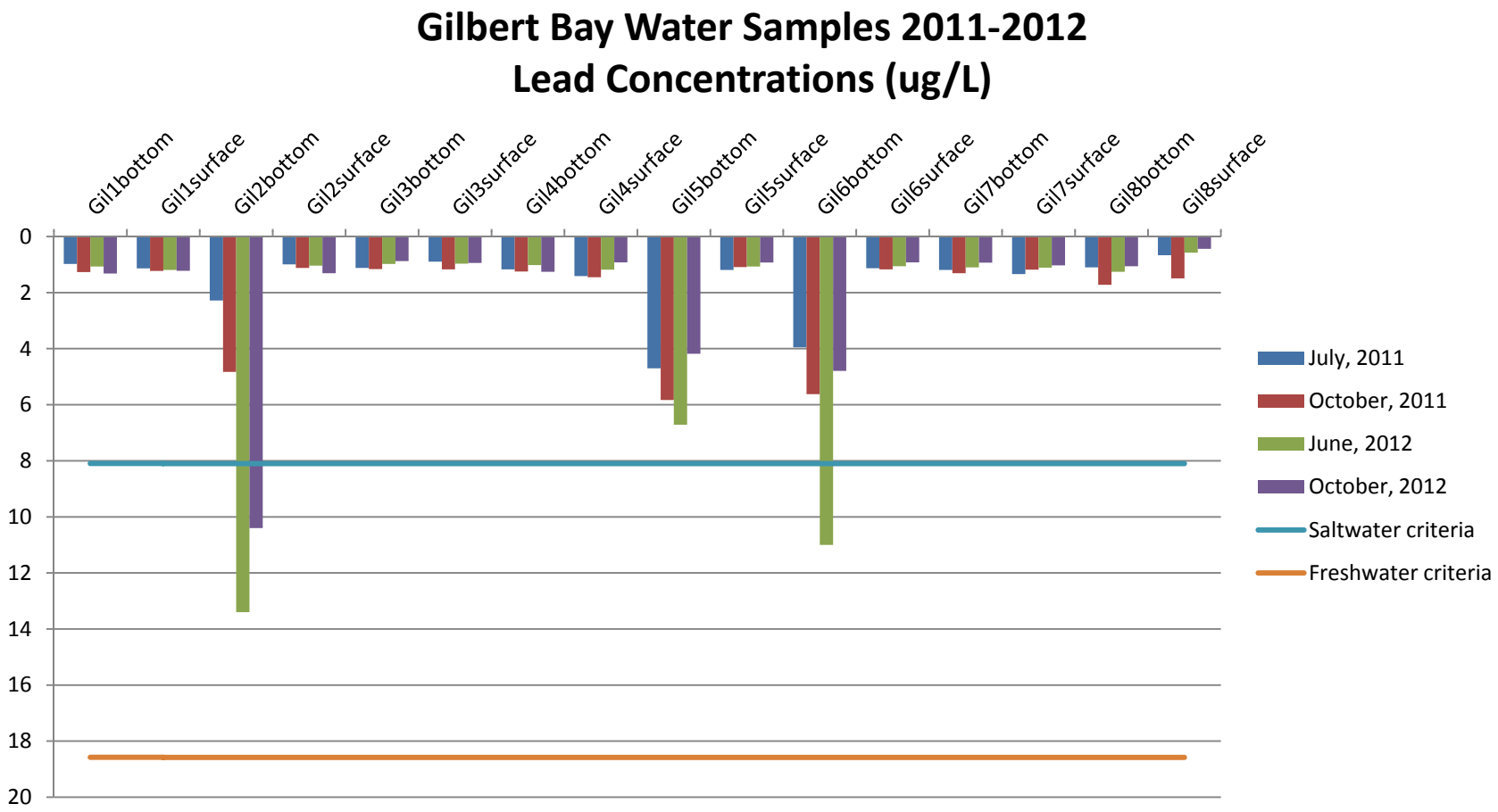
Cadmium Concentrations in Gilbert Bay



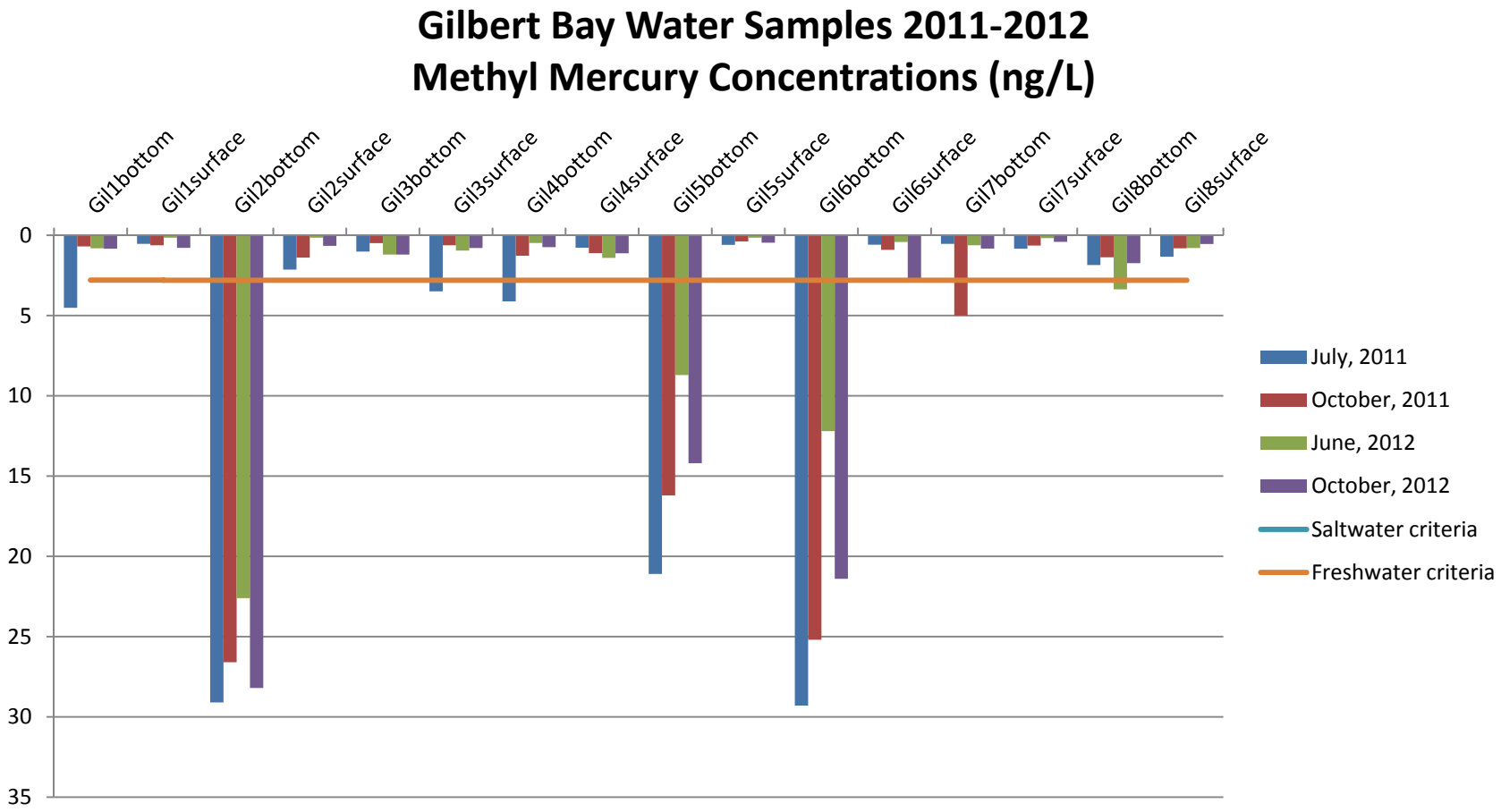
Copper Concentrations in Gilbert Bay



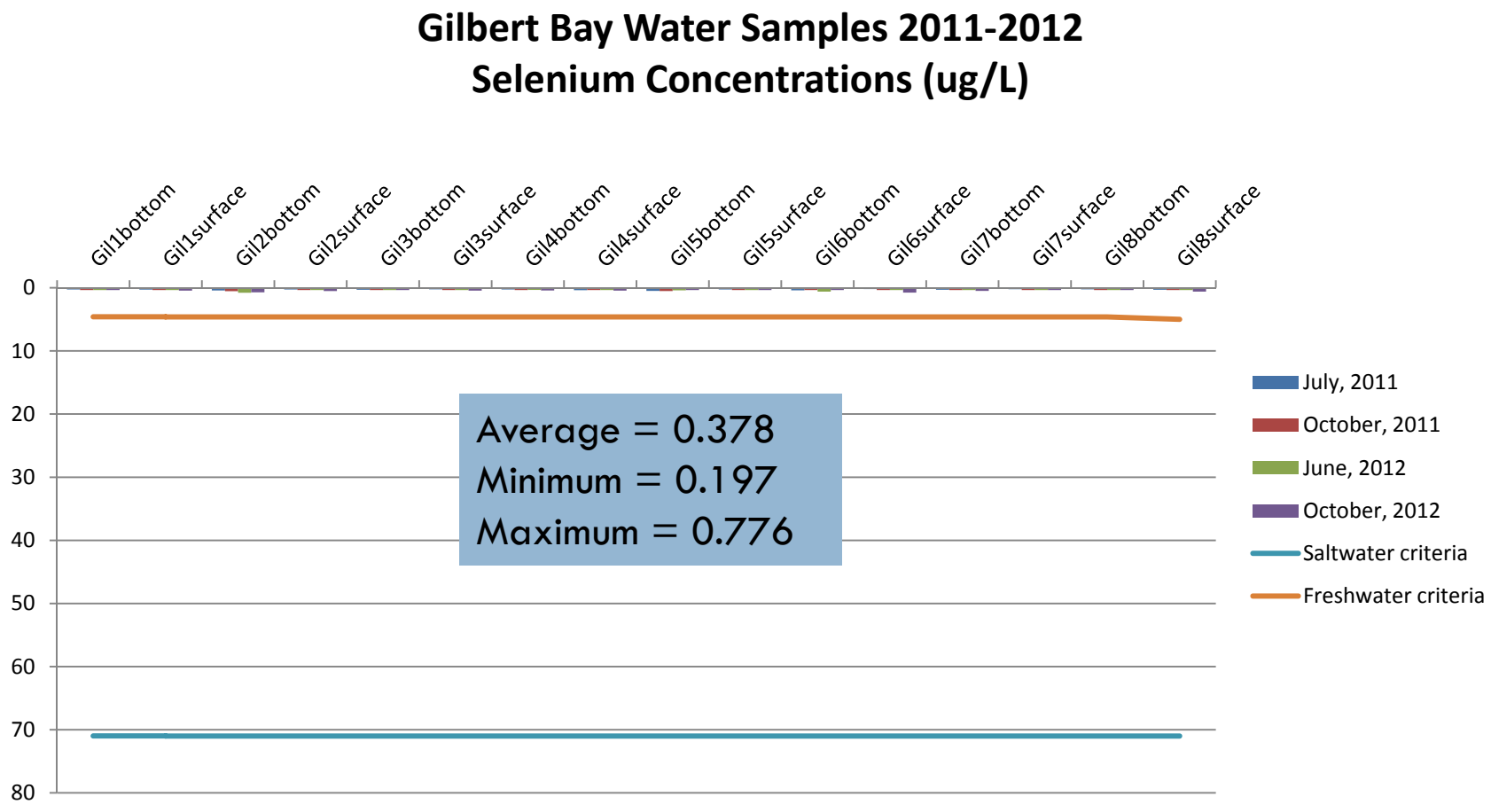
Lead Concentrations in Gilbert Bay



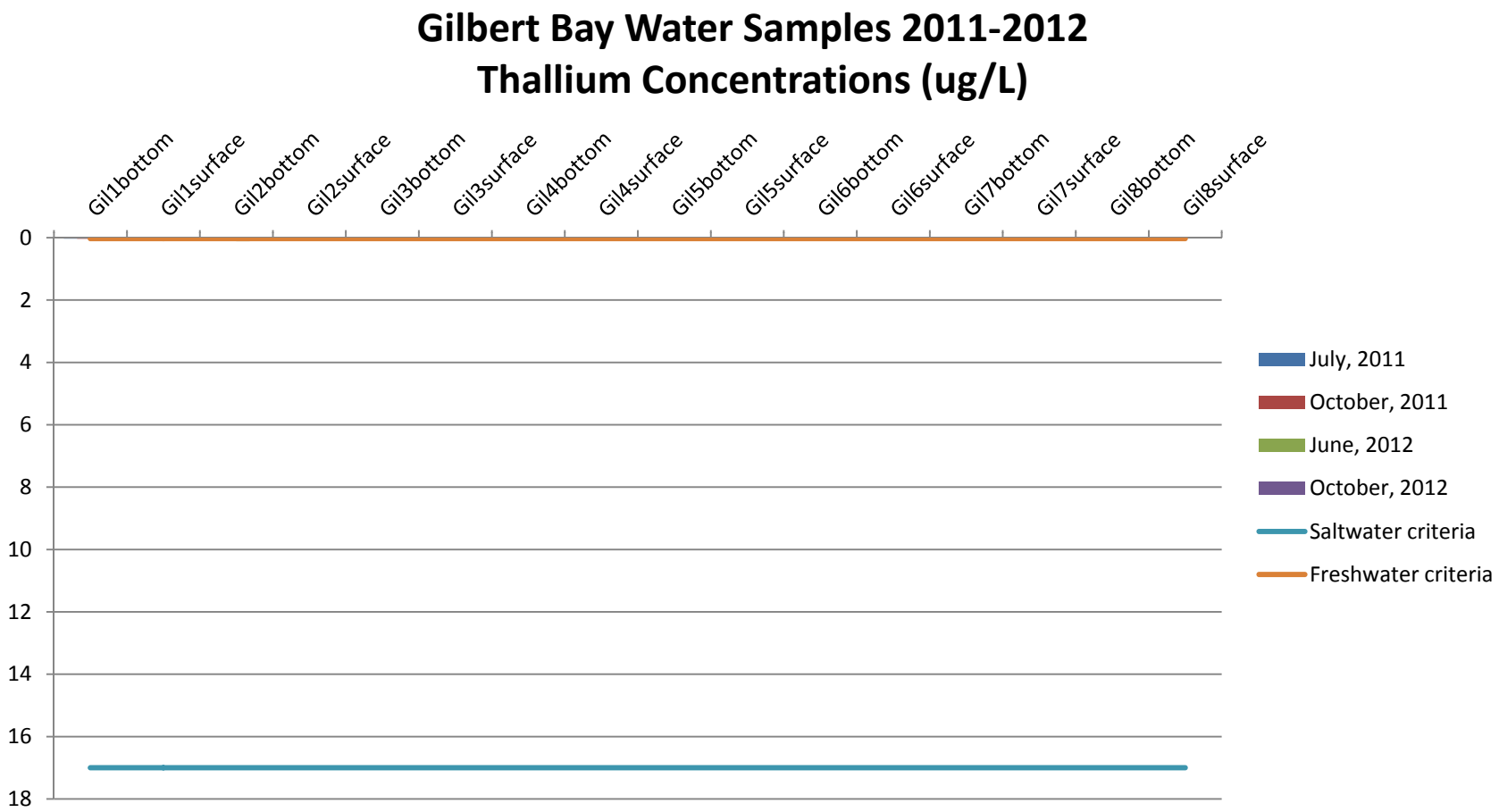
Methyl Mercury Concentrations in Gilbert Bay



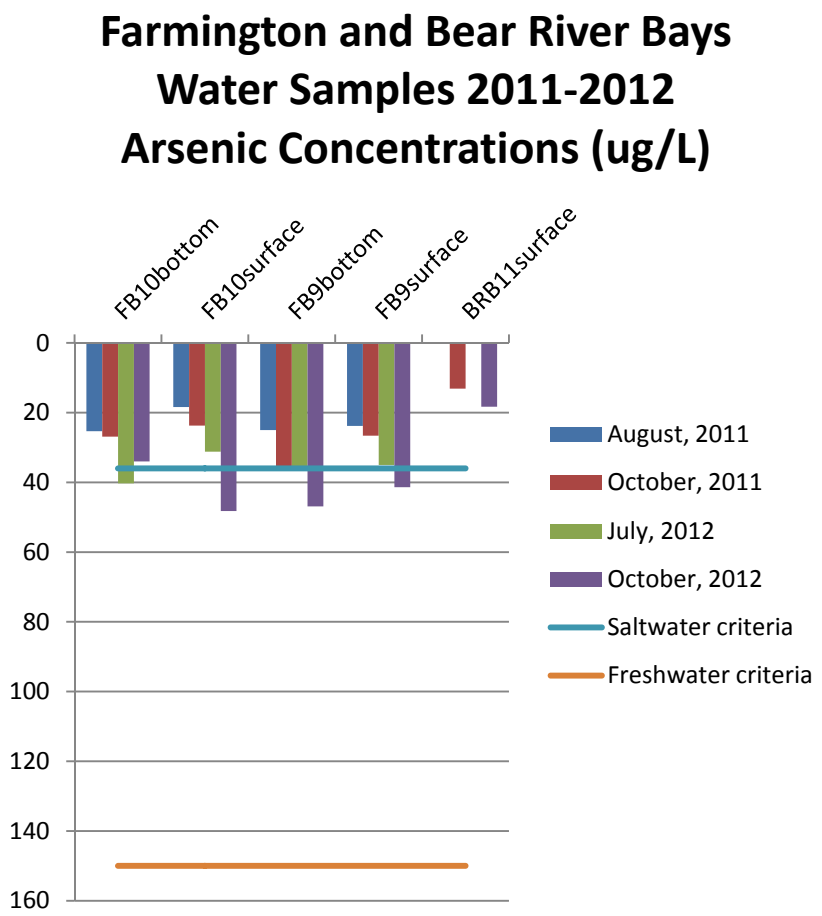
Selenium Concentrations in Gilbert Bay

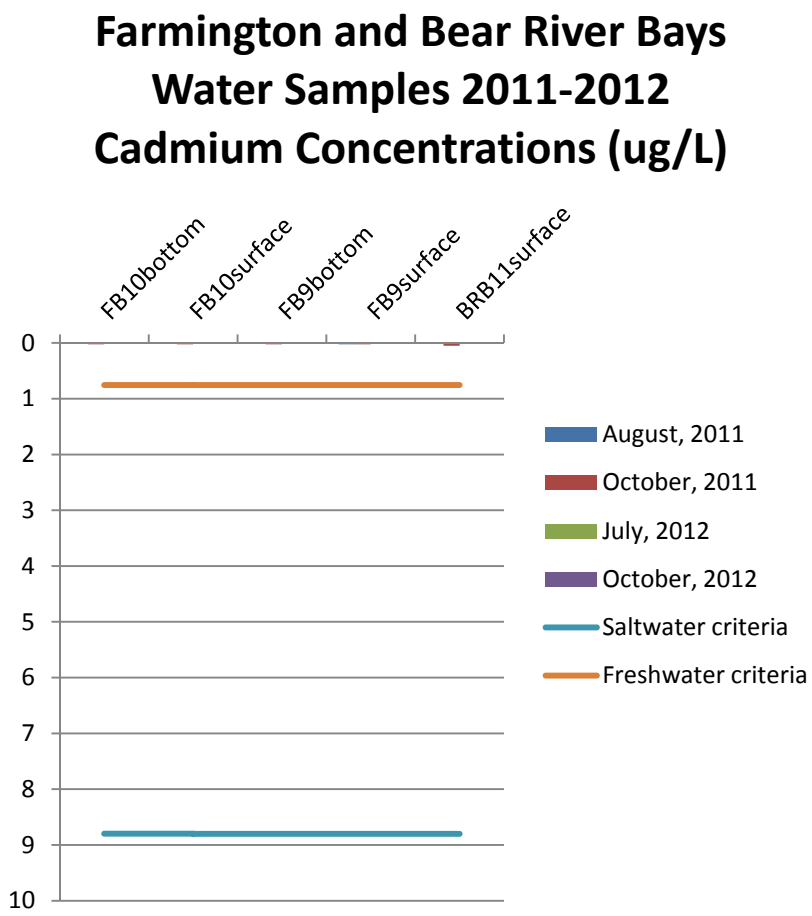


Thallium Concentrations in Gilbert Bay

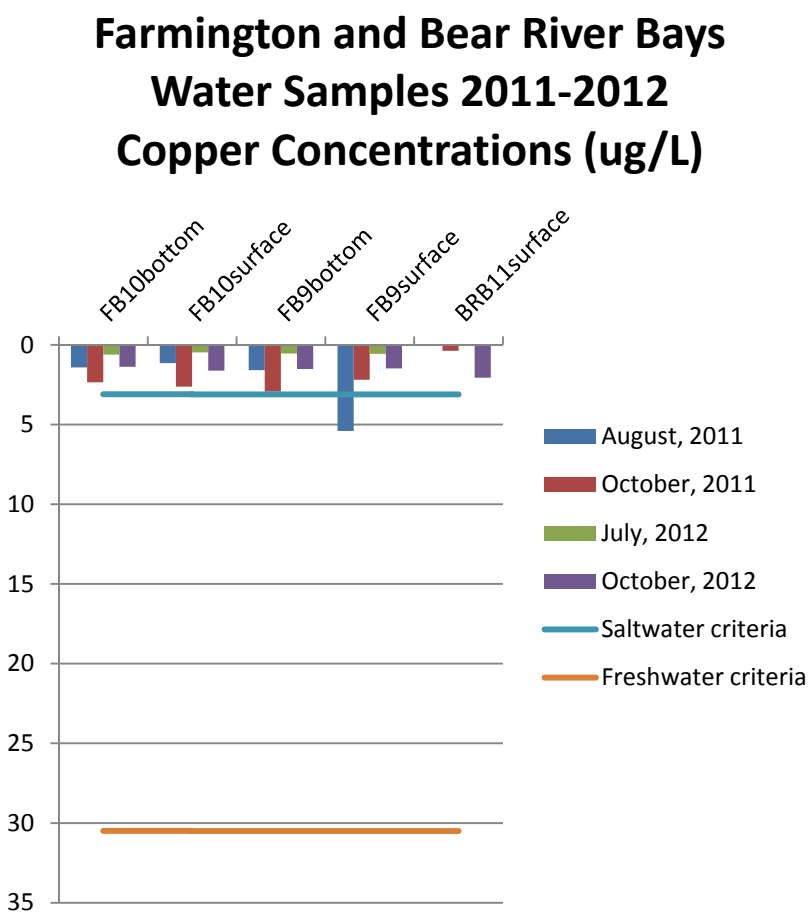


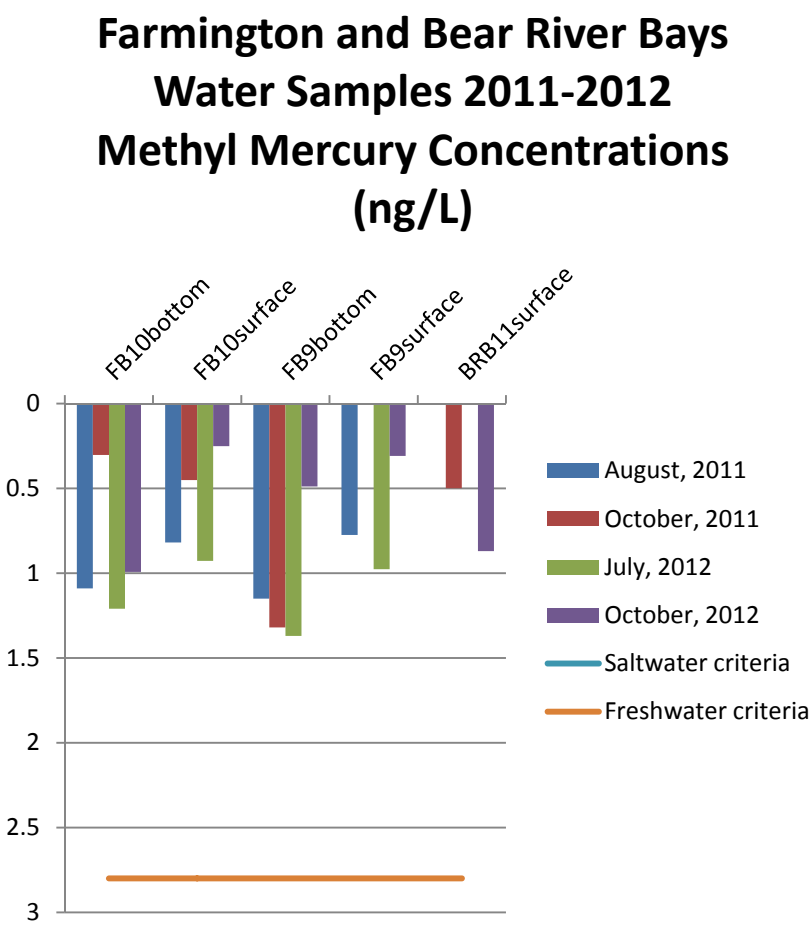
Arsenic and Cadmium Concentrations in Farmington and Bear River Bays



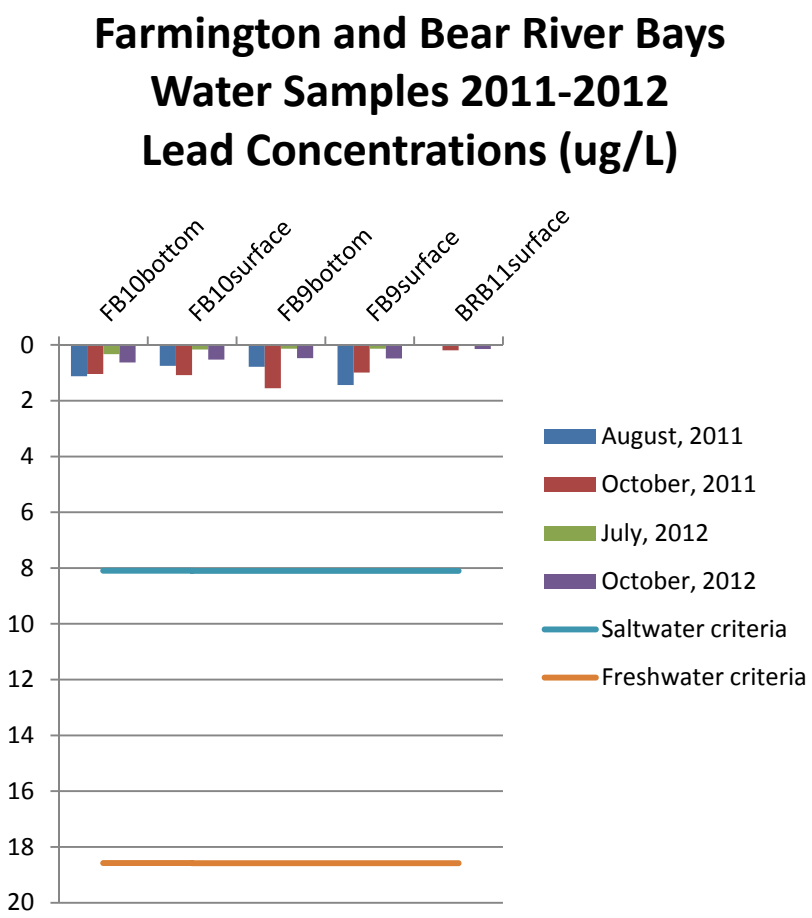


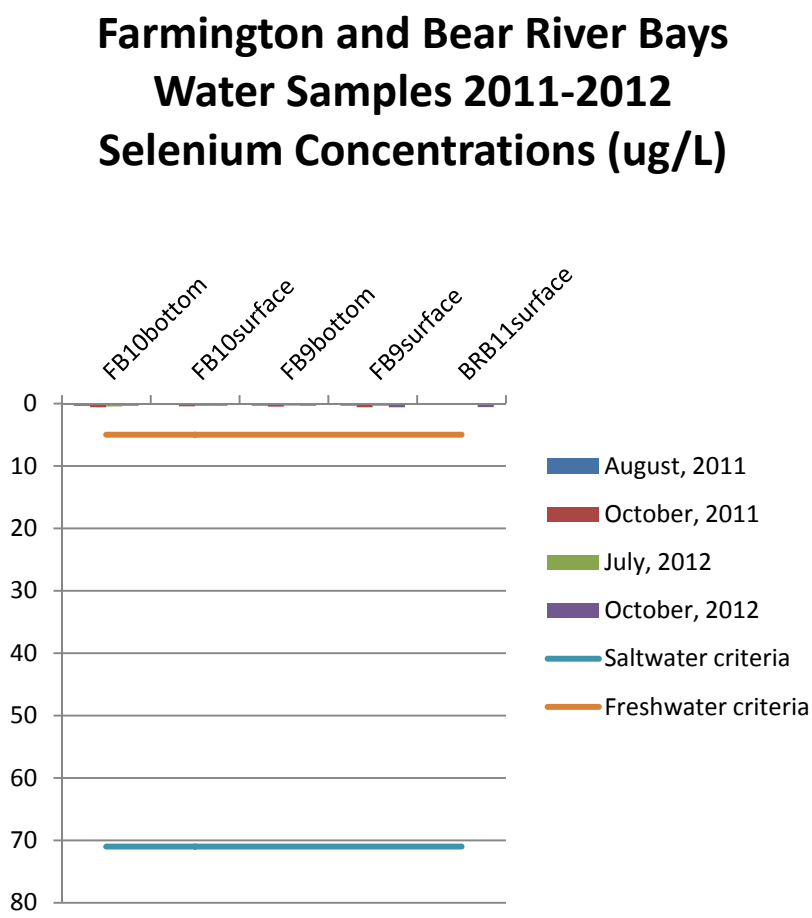
Copper and Methyl Mercury Concentrations in Farmington and Bear River Bays



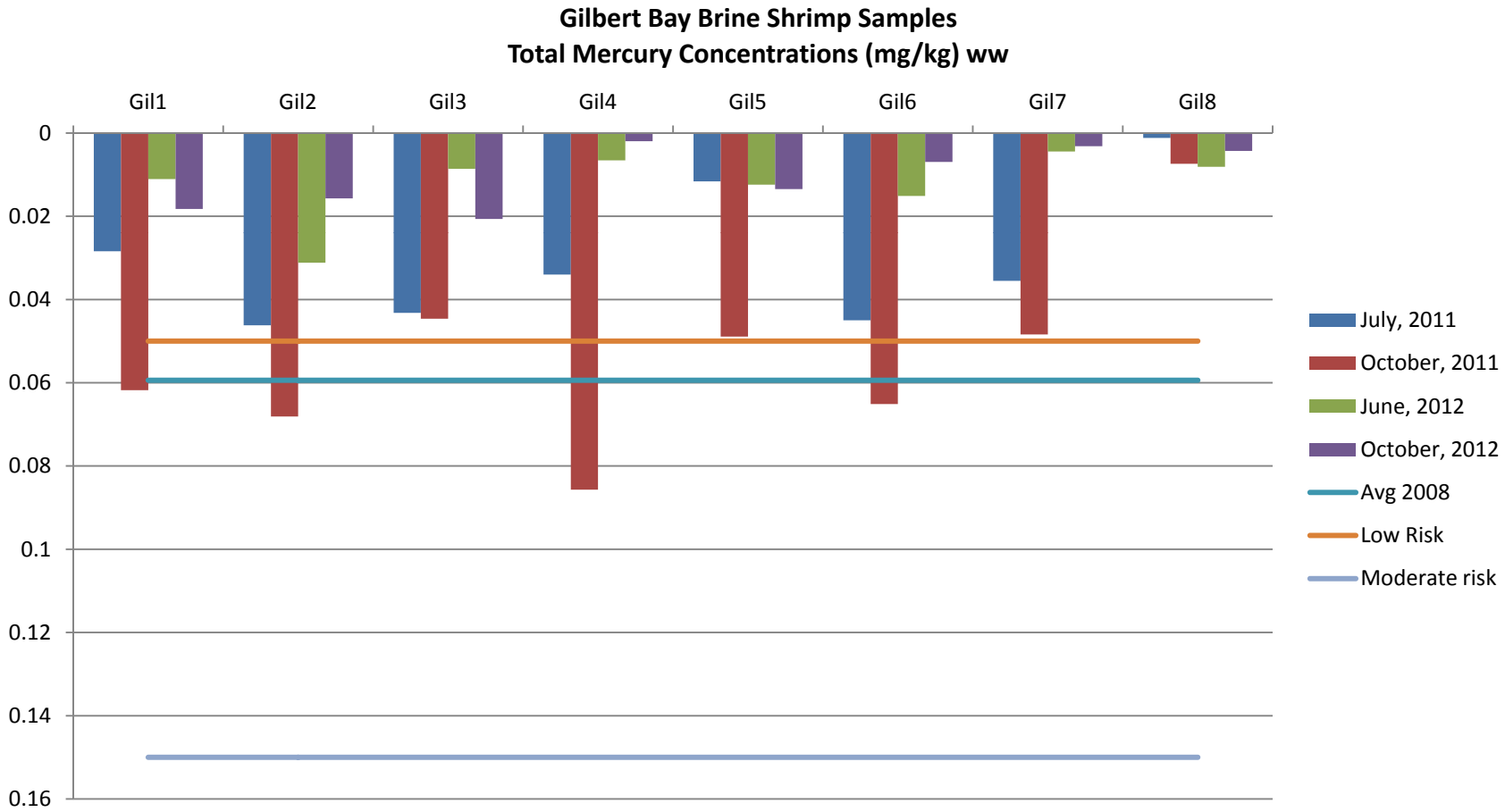


Lead and Selenium Concentrations in Farmington and Bear River Bays

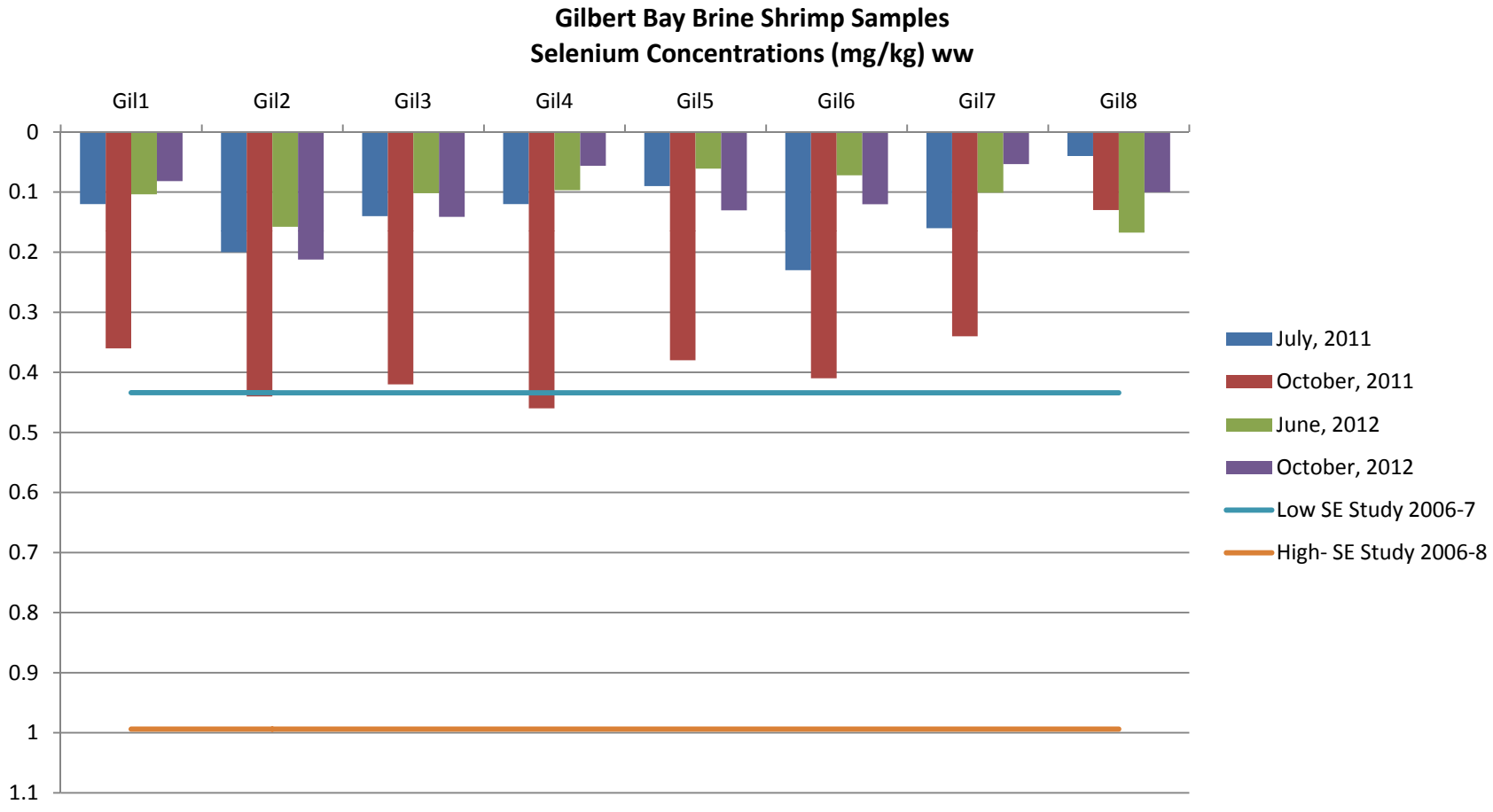




Total Mercury Concentrations in Gilbert Bay Brine Shrimp



Selenium Concentrations in Gilbert Bay Brine Shrimp



Toxicity Testing

- Objective : estimate range of chemical concentrations that produce observed quantifiable response under controlled lab conditions
- Test Organisms: Brine Shrimp and Brine Flies
- Researchers: Gary Belovsky and David Buchwalter
- Phases:
  - Acute Toxicity – deleterious effect, short term exposure (4 days)
  - Chronic Toxicity – long term exposure

Pollutant Prioritization

- Used only 2011-12 Baseline Sampling Data
- Shallow brine layer concentrations given greater weight than deep brine layer concentrations
- Mean concentrations were divided by 1) Utah's freshwater aquatic organism chronic criteria, 2) EPA's marine chronic criteria or 3)other benchmarks and ranked
- Further ranked by whether the pollutant is present in known discharges to GSL and by existing brine shrimp, brine fly toxicity studies

Pollutant Prioritization

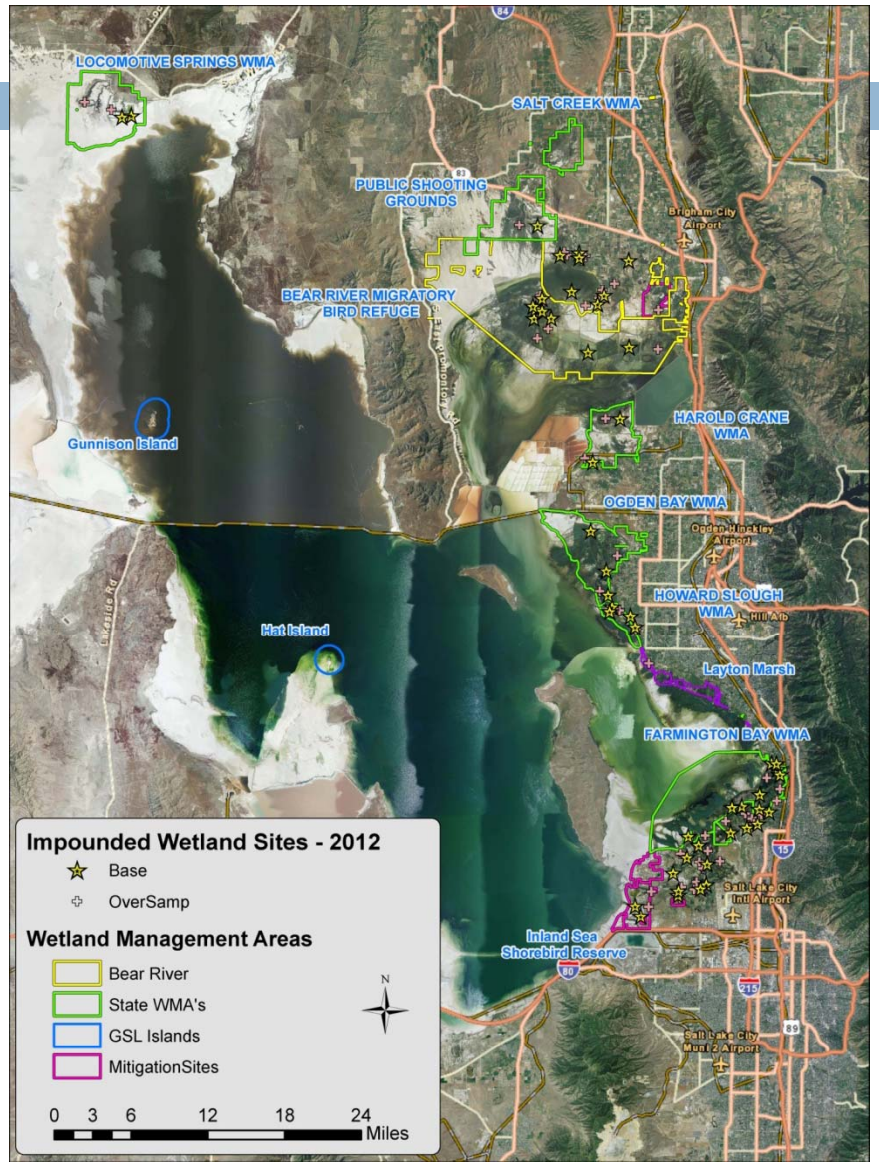
1. Arsenic
2. Copper
3. Methylmercury
4. Lead

- Deferred: ammonia, cadmium, total mercury, selenium, thallium, and zinc

Willard Spur Research

Farmington Bay Sampling

Impounded and Fringe Wetland Assessments



What Happens Next

- 2013
  - Continue Baseline Sampling Plan in partnership with USGS and Davis County Health Department
  - Implement year 1 of the Toxicological Testing
  - Implement Interim Permitting Approach
  - Validate MMI for Impounded Wetlands and begin Fringe Wetland sampling and assessment
  - Adoption of GSL water quality strategy by the Water Quality Board
- 2014
  - Continued sampling
  - Year 2 of Toxicological Testing
  - Implement Laboratory Round Robin
  - Develop Core Components 4 (Public Outreach) and 5 (Resource)

Contact Information

- The Great Salt Lake Water Quality Strategy can be accessed at http://www.waterquality.utah.gov/greatsaltlake/

- Call or contact me if you have any thoughts or questions about water quality on Great Salt Lake jgardberg@utah.gov

Photo courtesy of Charles Uibel, greatsaltlakephotos.com

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