San Francisco Bay Pilot

1. Pilot overview & inventory

   Katie Harrold, SFEI

2. Suspended-sediment flux study

   David Schoellhamer, USGS

3. Nutrient study

   Pilot goals & needs

   Katie Harrold, SFEI

Flux in estuaries

- Rivers: commonly measure load (or flux, mass/time)
- Estuaries: commonly measure concentration, not load, because of tides and bidirectional flow
- Need load for constituent budgets, TMDLs, identification of sources and sinks

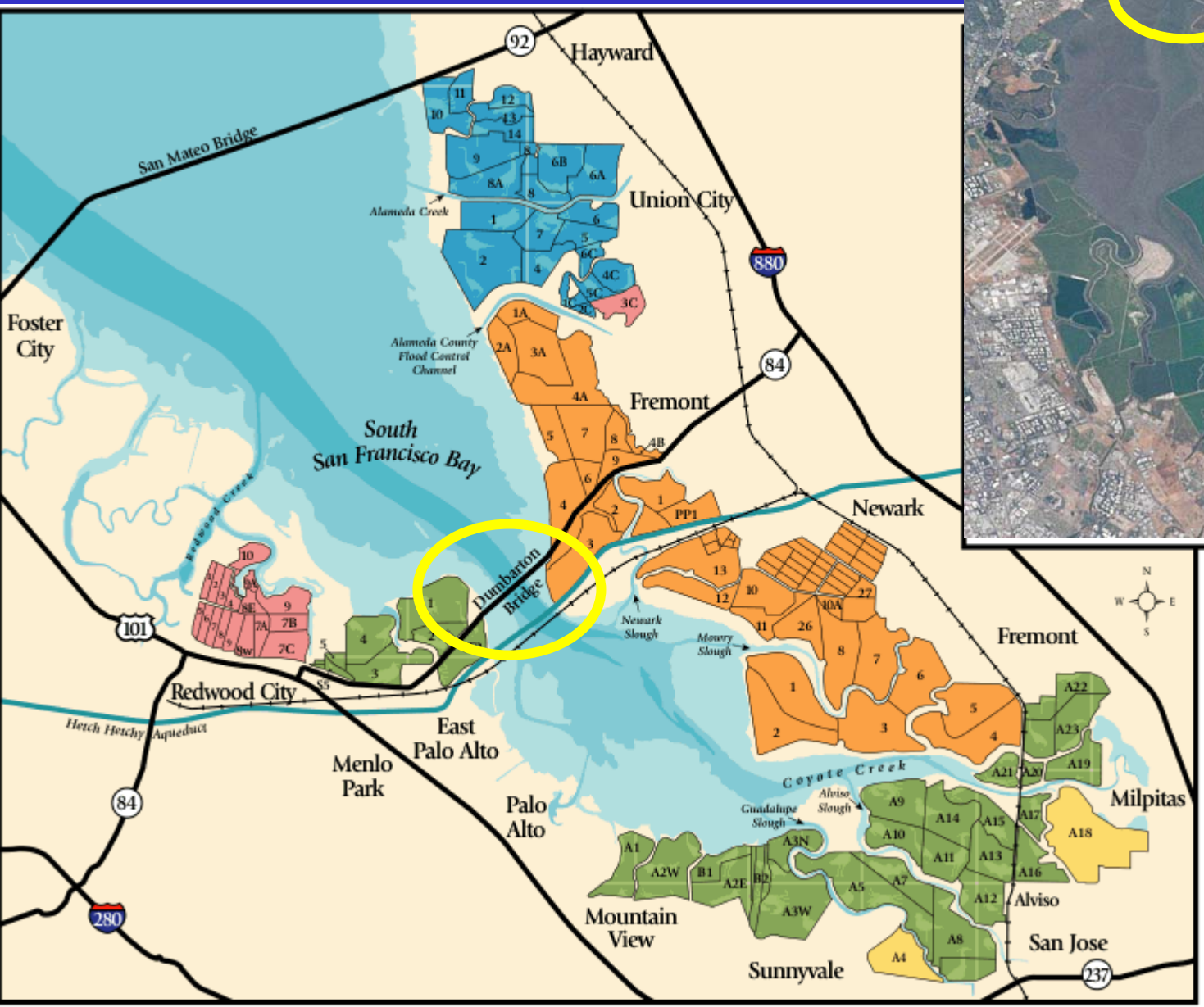
USGS

Measuring loads in tidal rivers

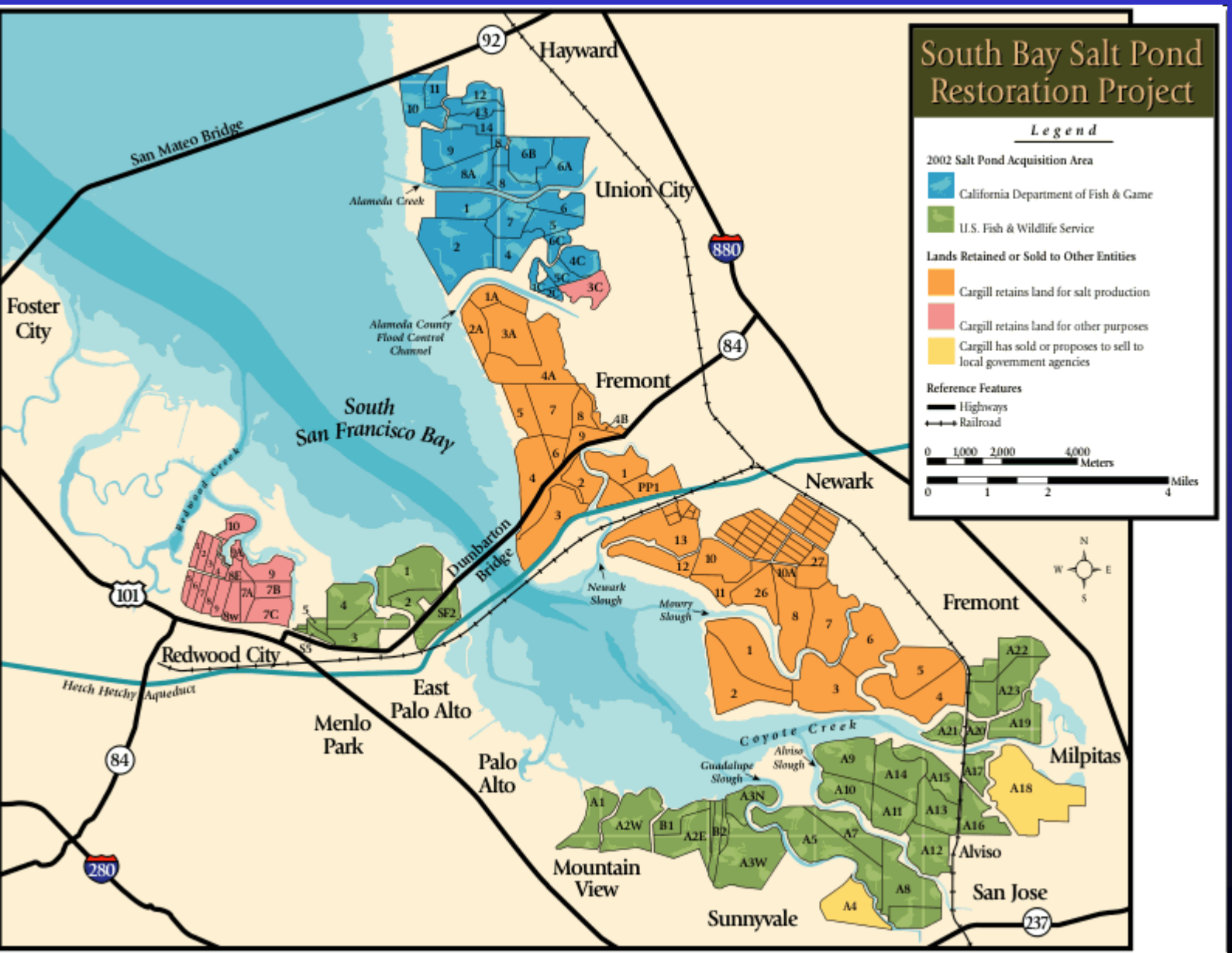
- Wright & Schoellhamer, *Water Resources Research*, 2005
- Pilot: extend technique to open estuarine waters

Constituent	Method	Frequency
1) Water elevation	Pressure transducer	15 minutes
2) Index velocity	Sideward looking ADCP	
3) Point optical backscatter or path acoustic backscatter	Optical (since 1992) or acoustic	
4) Discharge	Downward ADCP transect	Multiple boat measurements one day every 3-4 weeks
5) Velocity-weighted cross sectional average suspended-sediment concentration	Equal width or discharge increment	
6) Discharge	Index velocity method (calibrate 1 and 2 to 4)	15 minutes
7) Velocity-weighted cross sectional average suspended-sediment concentration	Calibrate 3 to 5	
8) Suspended-sediment flux (kg/s)	Product of 6 and 7	

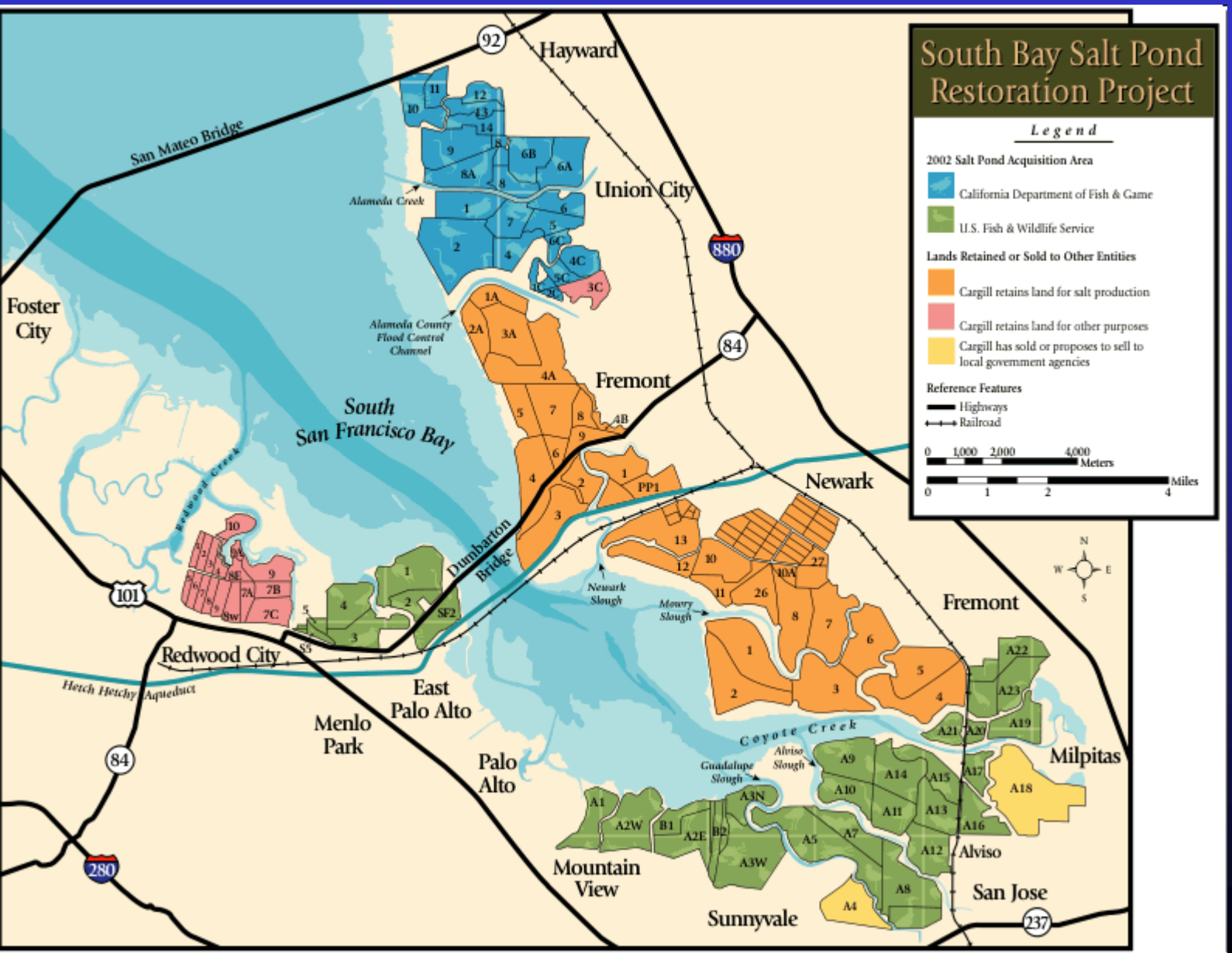
Dumbarton Bridge

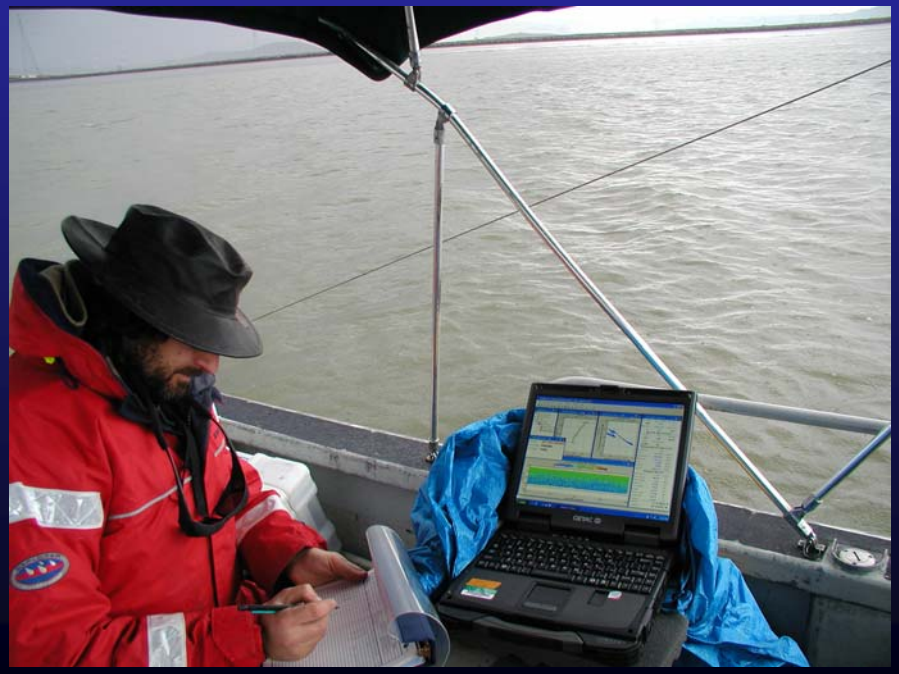


Wetland restoration, mudflats



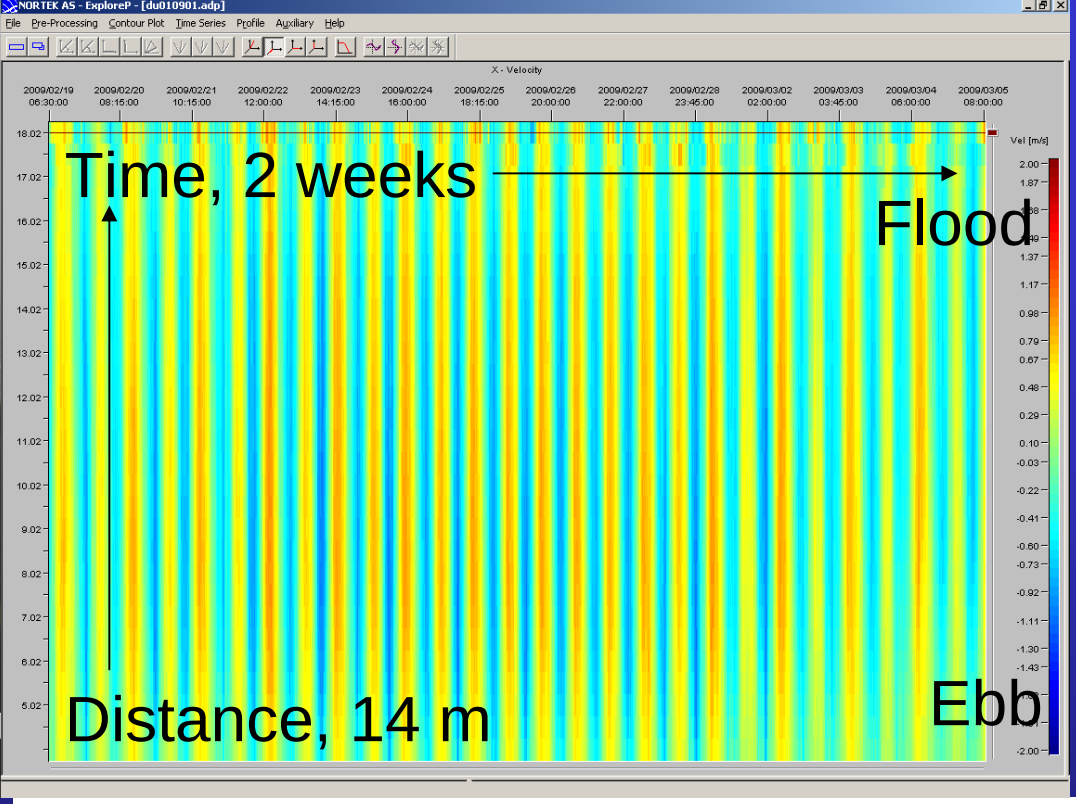
Urban watershed, wastewater

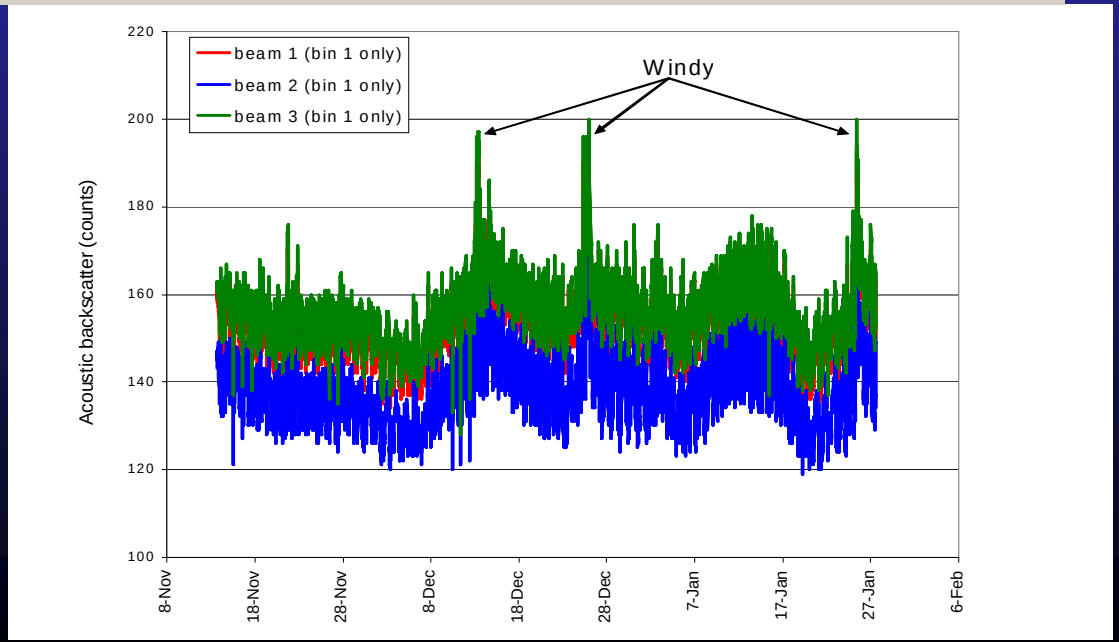


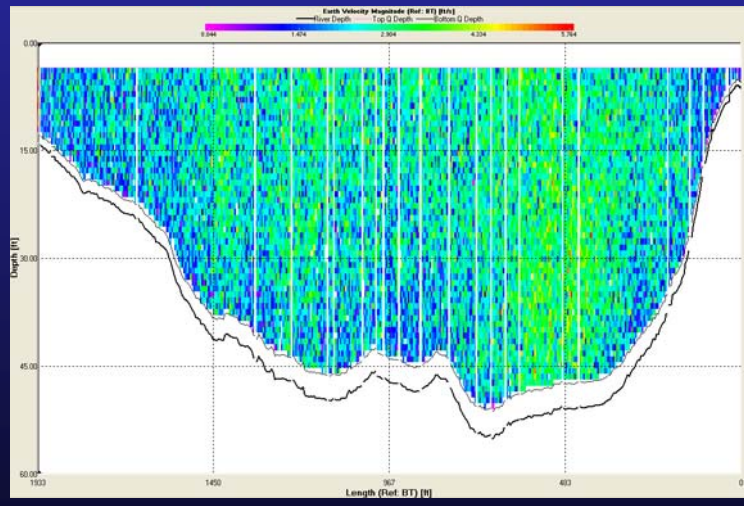


USGS

Data: velocity and backscatter







USGS

Future plans

- FY2009: Operate station, intensive sampling, modify as needed. Coordinate with USGS study of restoration, mudflat changes, and birds
- FY2010: Operate station, interpret data, determine the direction and magnitude of sediment transport at Dumbarton and the physical mechanisms that affect it, write journal article.
- FY2011+: Add constituents, stations, estuaries

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