

Streamgaging Networks: Past, Present and Future



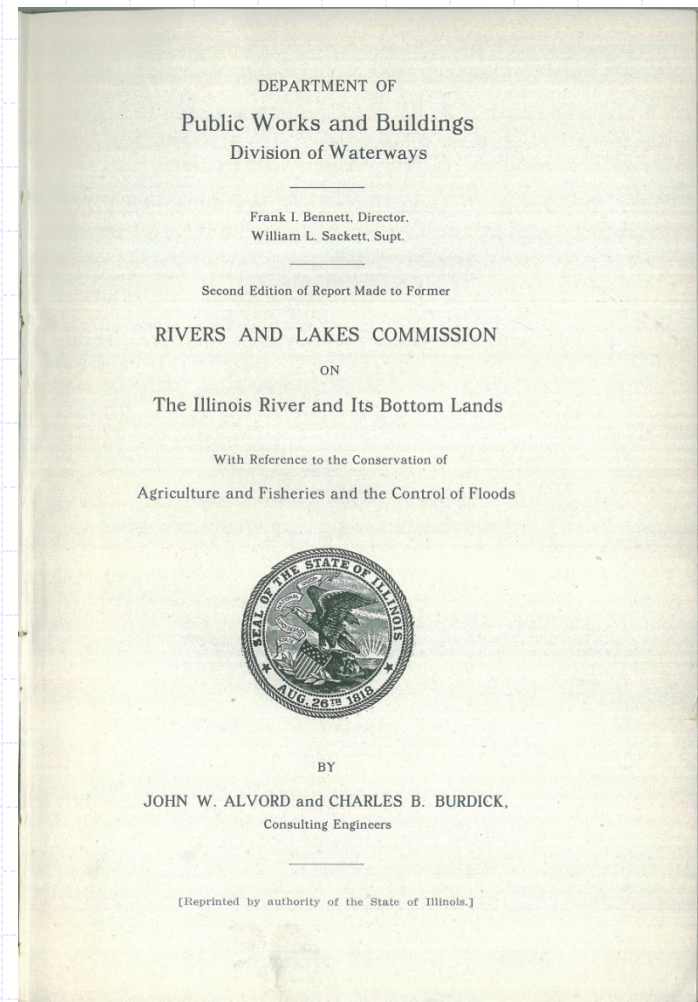
11th Biennial Governor's Conference on
the Management of the Illinois River
System, October 4, 2007



In the United States, there is an important resource which aids in preventing loss of life, saves one billion dollars a year in property losses, and allows bridges to be properly designed and drinking water allocated. Yet, it is a resource that the general public knows very little about. This resource is the USGS stream-gaging network. Delaware River Basin Commission

Past: Purposes and Uses

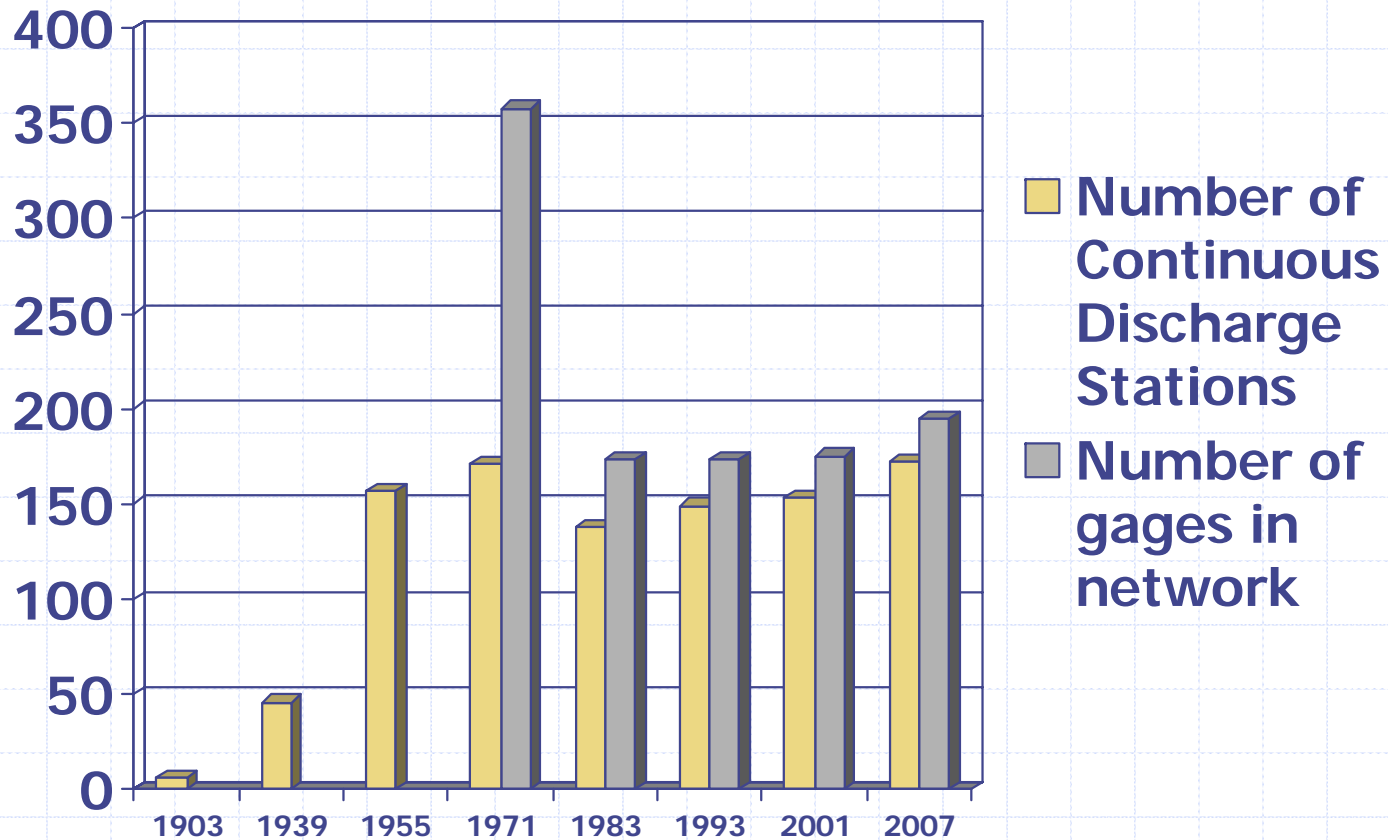
- Water Supply
- Infrastructure Design
 - Dams
 - Levees
 - Bridges
 - Roads



Past: Networks

- USGS Cooperators Program
 - Began about 112 years ago and still in existence
 - The United States Supreme Court declared income tax to be unconstitutional in *Pollock v. Farmers' Loan & Trust Co.*
 - First American Automobile race. 54 miles from Chicago's Jackson Park to Evanston, Illinois. Frank Duryea wins in about 10 hours.
- No other significant networks

Past: Networks



Past: Technology-Industrial Age

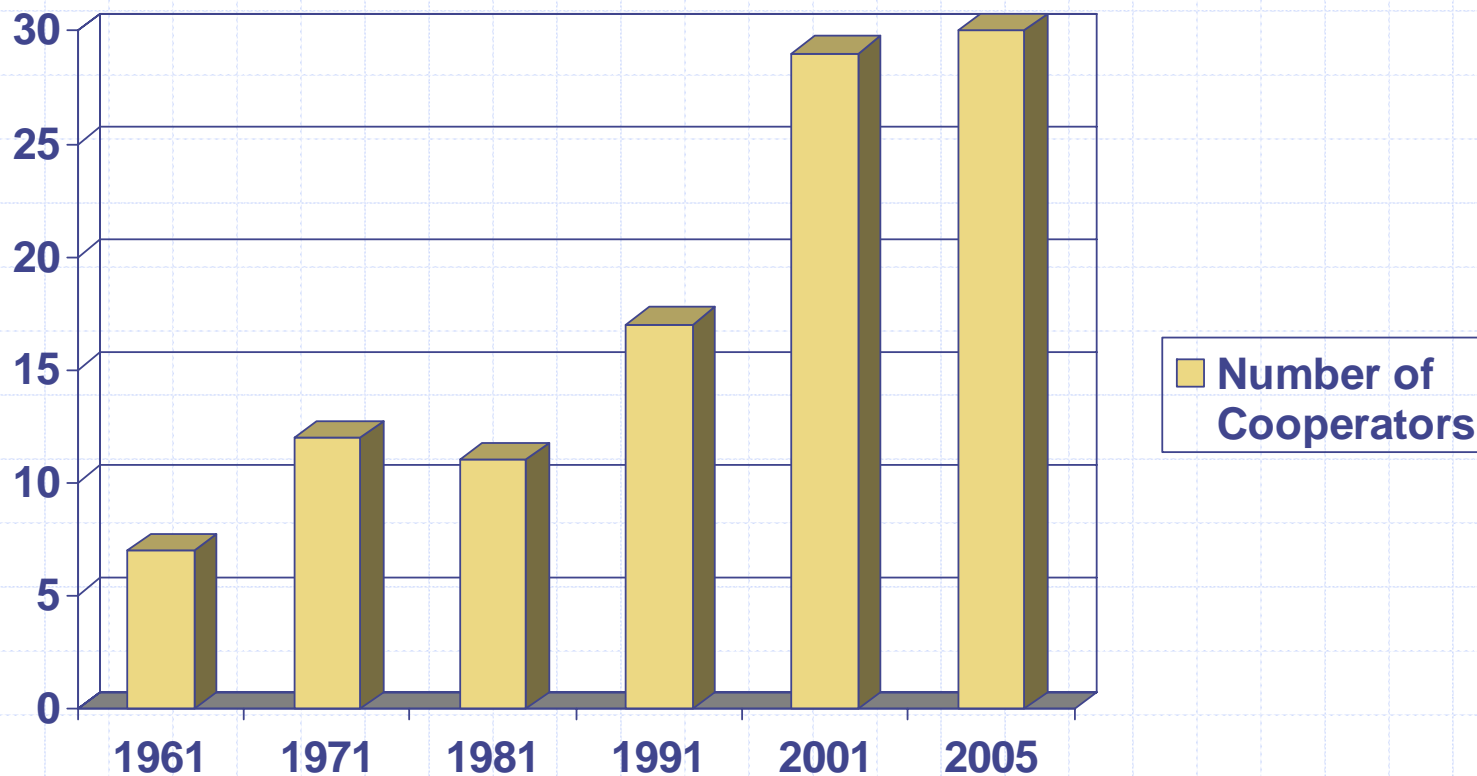
- Gears
- Cables
- Pulleys
- Floats
- Pen on paper
- Currents Meters
- Manual Transcriptions



Past: Who Pays

- USGS
- Corps of Engineers
- State of Illinois
- Chicago Sanitary District
- Peoria Water Works
- Others

Past: Who Pays?



Present: Purposes and Uses

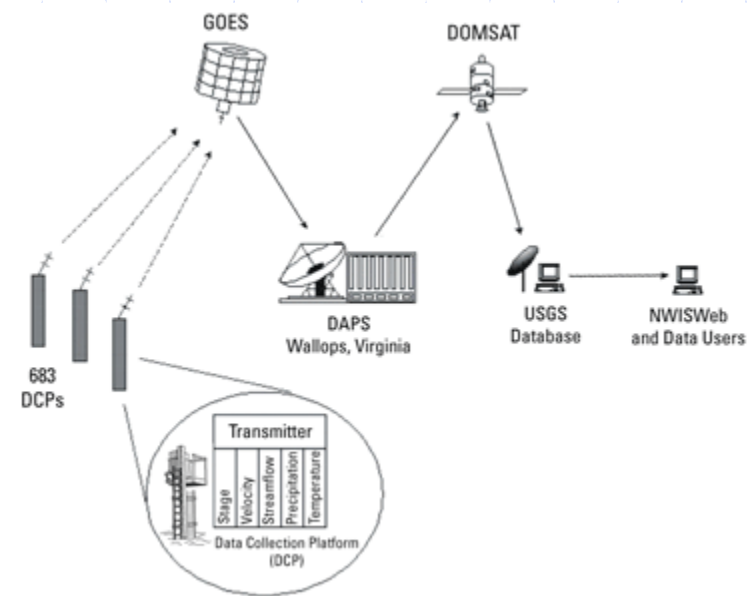
- Quantity/Variation
 - Flood Forecasting/Flood Control
 - Water Supply Allocation
 - Irrigation
 - Drinking Water Management
 - Navigation
 - Highway Bridges
 - Recreation

Present: Purposes and Uses

- Legal and Treaty Obligations
 - Interstate Waters
 - International Waters
- Infrastructure Design
- Water Quality
 - Wastewater Treatment Plants
 - Water Quality Standards Development
 - Recreation (fishing, canoeing, swimming, etc.)

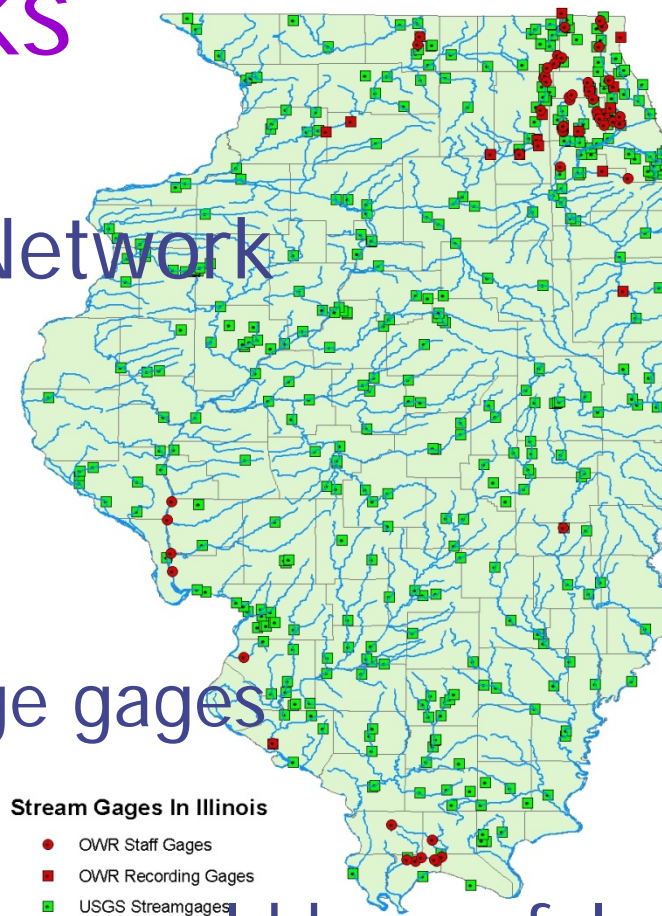
Present: Technology-Information Age

- Acoustic Doppler Current Profiler (ADCP)
- Data Collection Platforms (DCP)
- Sonar
- Radar



Present: Networks

- USGS Cooperators Network
 - 195 gages
- OWR Network
 - 13 recording gages
 - Numerous crest stage gages
- Other networks (?)
 - Catalog of information would be useful



Present: Networks

- Rock River at Rockton (daily values)
 - 6/28/1903 to current
 - Wright Brother's first flight
 - Cubs last three games of season vs. Boston Beaneaters

Present: Networks

- Illinois River at Marseilles
 - 5/6/1892 to present
 - 115 years of peak annual events

Present: Networks

- USGS Cooperators Program



Science News – January 12, 2005
**Funding woes eroding national
stream gage network**

A record number of U.S. stream gages, possibly as many as 70, could stop collecting data during the next fiscal year if no funding emerges to pay for their continued operation, according to officials with the U.S. Geological Survey (USGS). Even more significantly, some of these gages have been in operation for decades. These cuts come as climate change, growing populations, and competing priorities for water, such as the preservation and restoration of aquatic habitats, are driving a need for more streamflow data, not less, say researchers.

Present: Public Policy

- Stream flow information is a public good (National Research Council, 2004)
 - Those who have not paid for the service (the majority of users) are not excluded from using it
 - Marginal cost of servicing additional individuals is zero

Present: What is the Cost?

- Cost of Stream Gaging
 - USGS Nationally (\$0.38/person/year)
 - USGS Illinois (\$0.18/person/year)
- Cost of Other Data Collection
 - Article I, Section 2 (\$1.89/person/year)

Present: What is the Cost?

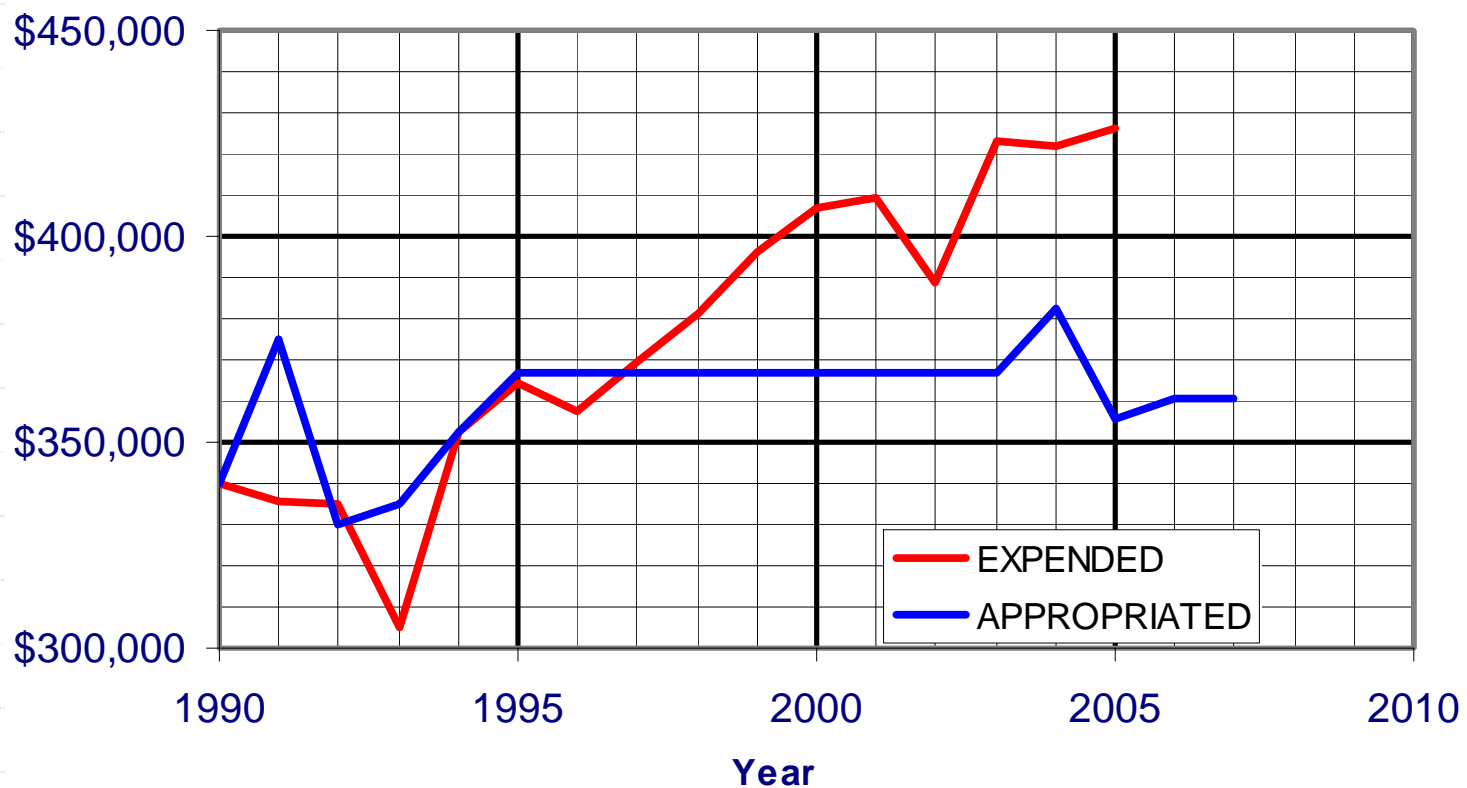
- Cost of Gages
 - \$5,000 Stage only
 - \$12,000 Discharge
 - \$20,000 - \$25,000 Index-velocity sites

Present: Who Pays

- Who pays for data?
 - Illinois network costs \$2,300,000
 - Cost increases ~ 2-3% per year
 - ~30 Cooperators
 - Corps of Engineers
 - State
 - Many local municipalities
 - Some private entities

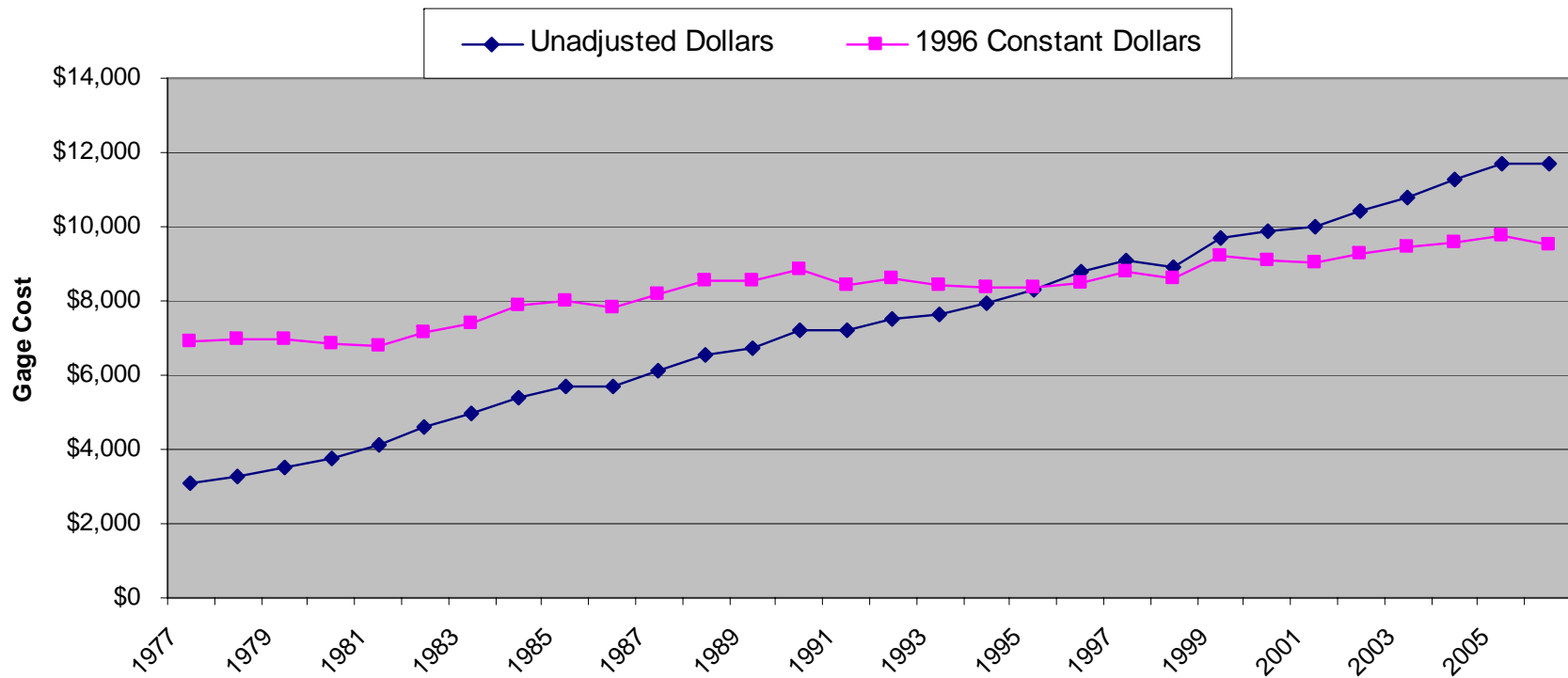
Present: Who Pays?

OWR Funding of USGS Network



Present: Who Pays?

Streamflow Gaging Costs



Present: Who Pays

- **Corps of Engineers** funding is derived from operational and maintenance funding of federal projects which has been under federal budget cutting scrutiny
- **USGS** budgets for the cooperative streamgaging program have been a target of congressional budget makers for several years
- **State** general revenue funds for streamgaging have been held level for over a decade
- **Local governments** have shown a greater interest in the data collection
- Limited analysis of data is being performed today, which maximizes data collection, but leaves analysis of the data to the users

Future: Purposes and Uses

- Same as present time
- Integration
 - Stream Stats
 - HEC-SSP
- Water Quality Analysis
- Others (?)

Future: Technology

- Spatial Resolution
 - Stations are getting smaller
 - Will monitor smaller streams (?)
- Time Response
 - Less lag or delay

Future: Who pays?

- Current cooperators (?)
- Water Taxing Bodies (?)
- Additional Private Users of Data (?)

Will the data be available when
you go look for it ?