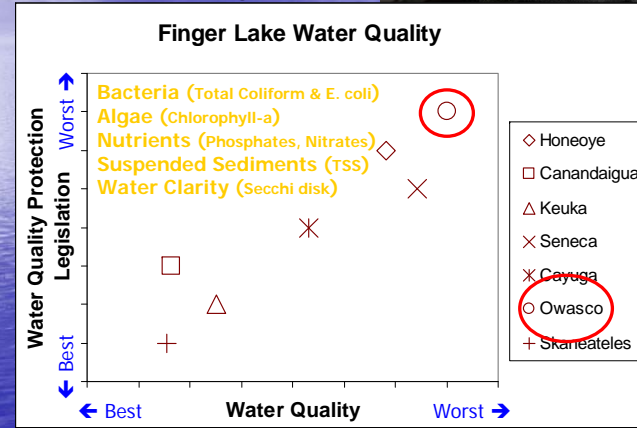


Owasco Lake Water Quality Issues: My 2011 Update Owasco Lake Day



John D Halfman
Environmental Studies Program
Department of Geoscience
Finger Lakes Institute

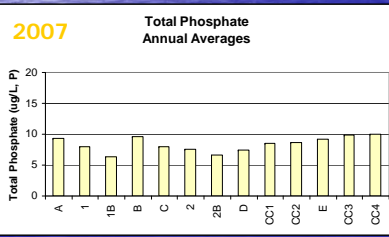
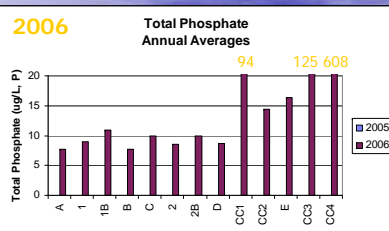
Review: 2005 Data Water Quality & Its Protection



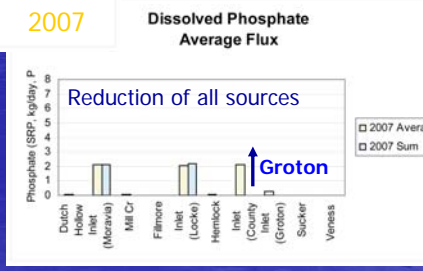
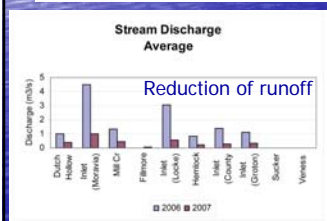
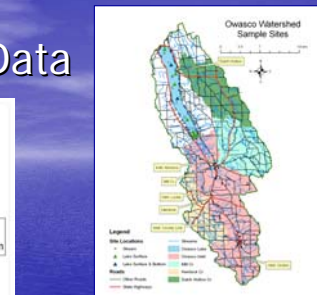
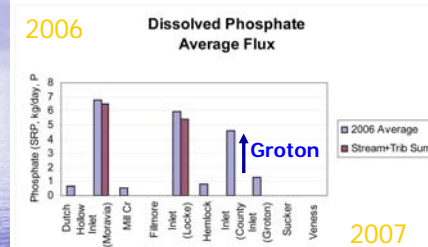
Bush, 2006, Undergraduate Honors Thesis

2006 Emerson Foundation Funds
2007 NYS Funds – Senator Nozzolio

Owasco Lake Phosphates (TP)



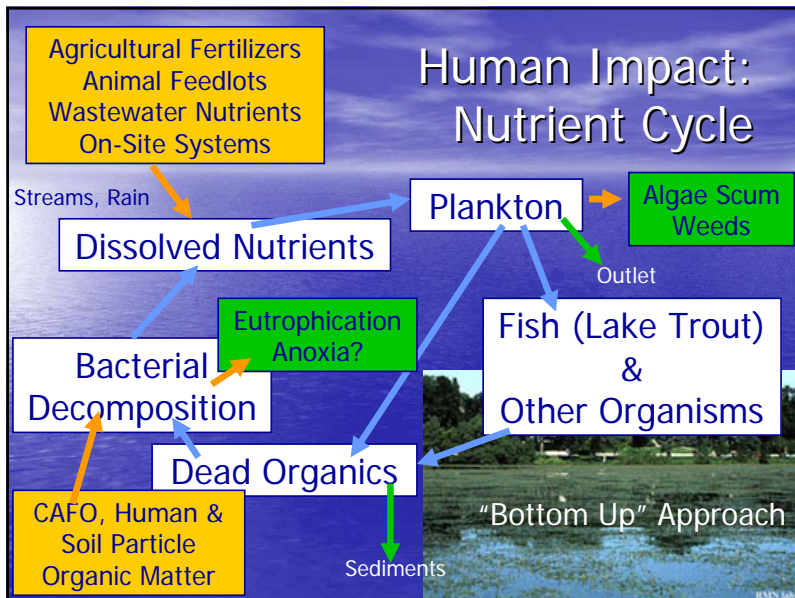
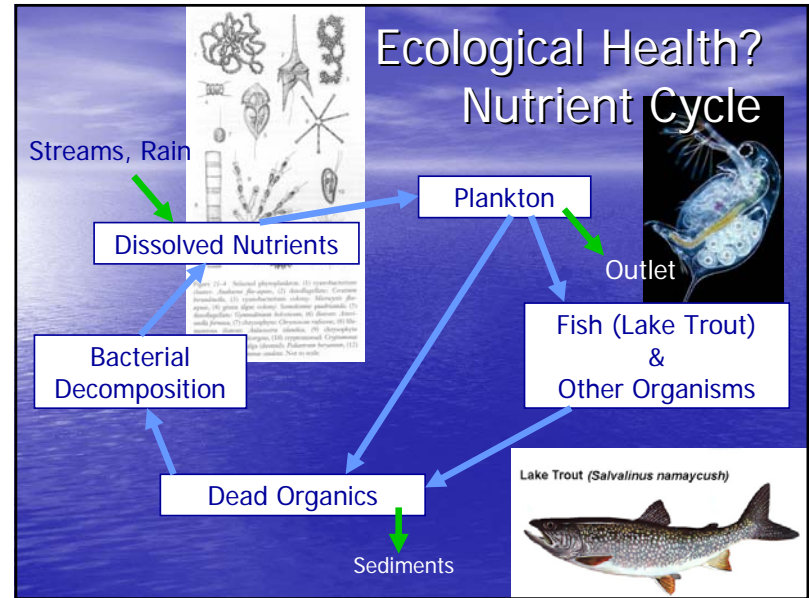
2006 & 2007 Stream Data



Water Quality Concerns

Runoff

- **Human Wastes**
 - Municipal Wastewater
 - On-Site Septic Systems
- **Animal Agriculture "CAFO" Operations**
 - Steroids & Antibiotics
 - Animal Waste
- **Plant Agriculture**
 - Fertilizers, Pesticides
 - Soil Erosion



2011 – Funding

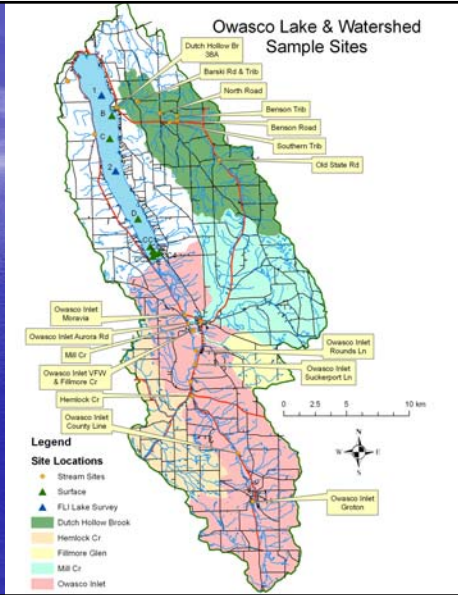
- **Watershed Monitoring**
 - Lake, Dutch Hollow Brook & Owasco Inlet
 - Cayuga County Legislator
 - Peter Tortorici - Chairman
- **Detailed Analysis of Dutch Hollow Brook**
 - Owasco Watershed Lake Association
 - Charlie Green – President
 - Underwritten by Local Foundations
- **Both due to the Persistence of Dr. Joe Wasileski**

Hourly Readings
Stage, Conductivity, Temperature

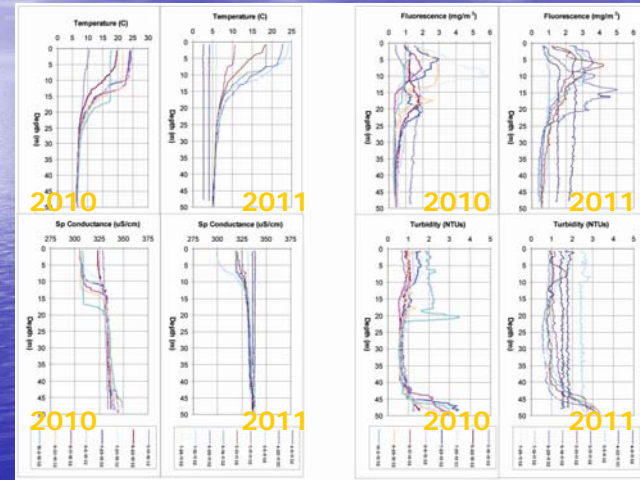
3 water samples/day

The Plan:

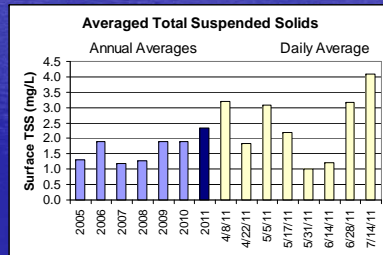
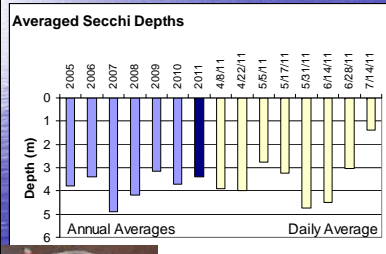
- **Lake**
 - Sites 1 & 2
 - Compare to past
- **Watershed**
 - Two Tributaries
 - Dutch Hollow Brook
 - Owasco Inlet
 - Nutrients
 - Locate Source(s)
 - Timing of Delivery
 - Events
 - Seasonal
 - Loading



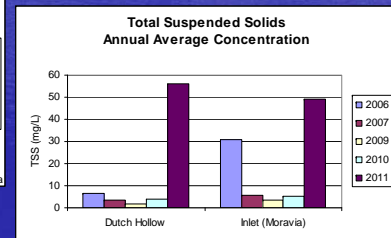
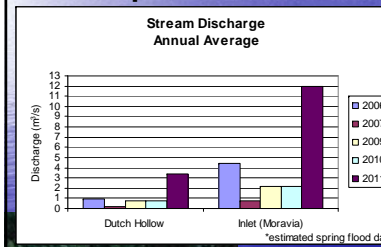
Lake Results: Water Column



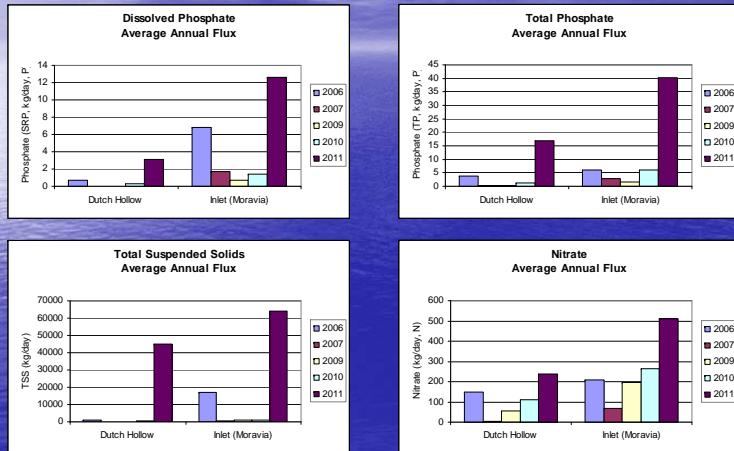
Lake Results: Secchi Depths and Suspended Sediment



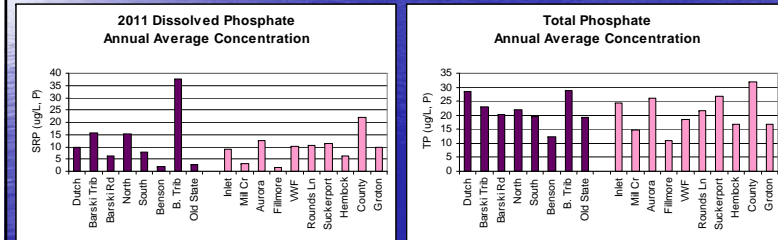
Stream Results: Flow and Suspended Sediments



Stream Results: Nutrient Flux

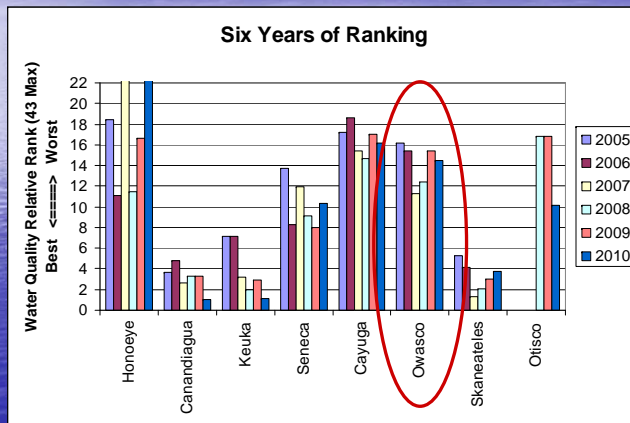


Nutrient Sources: Many Upstream Sites

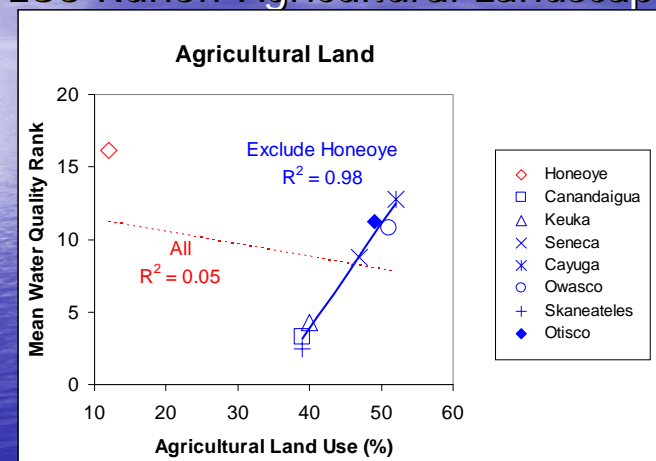


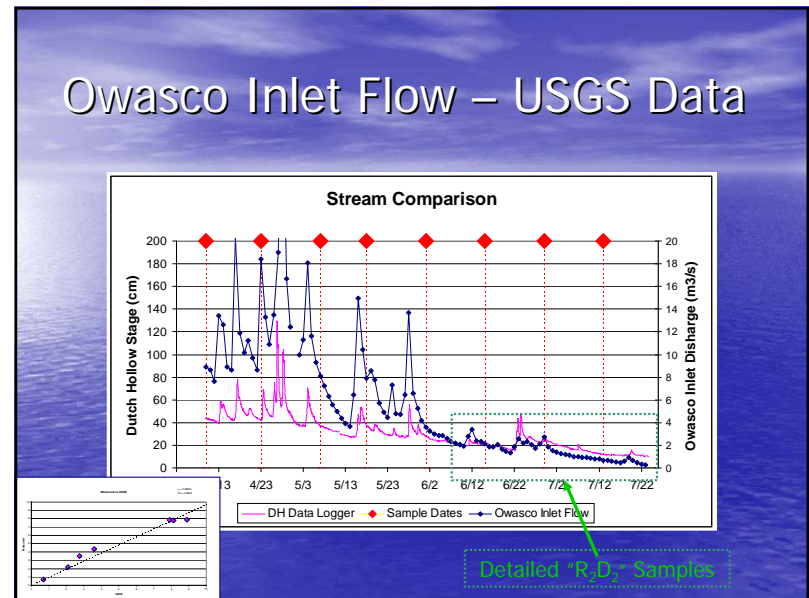
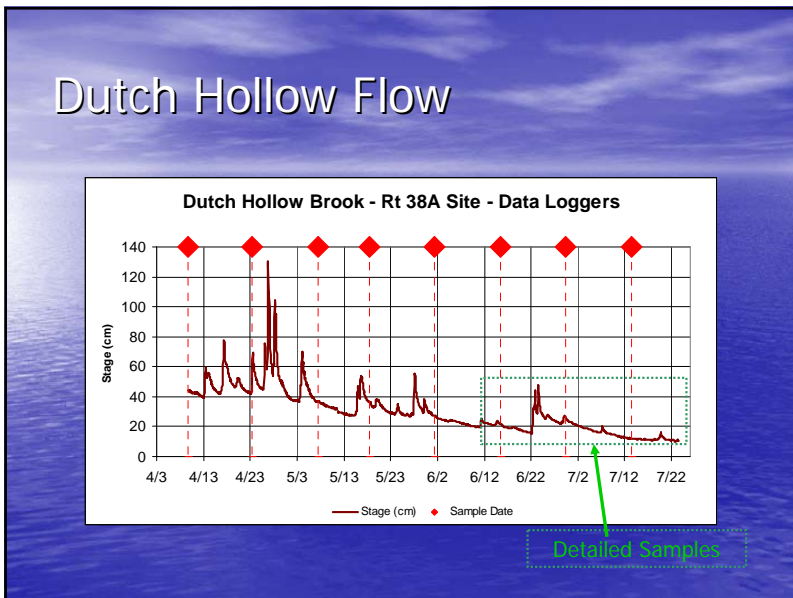
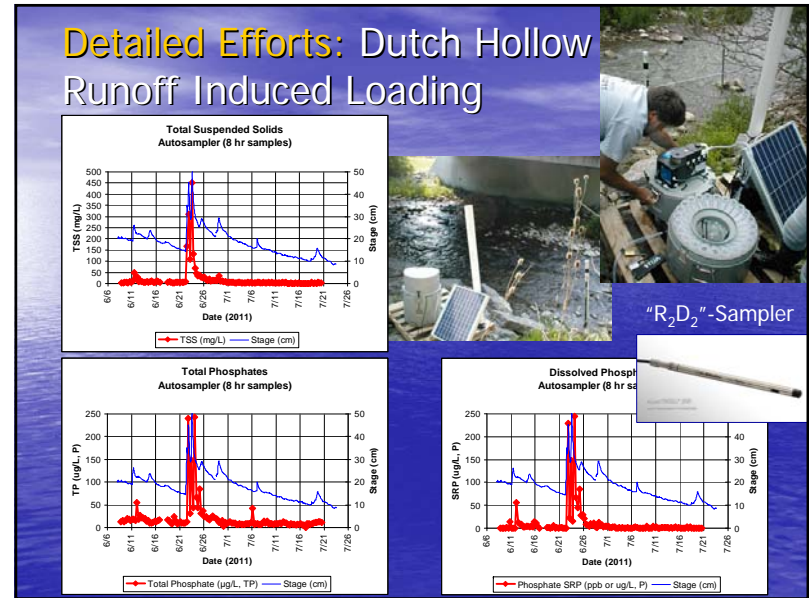
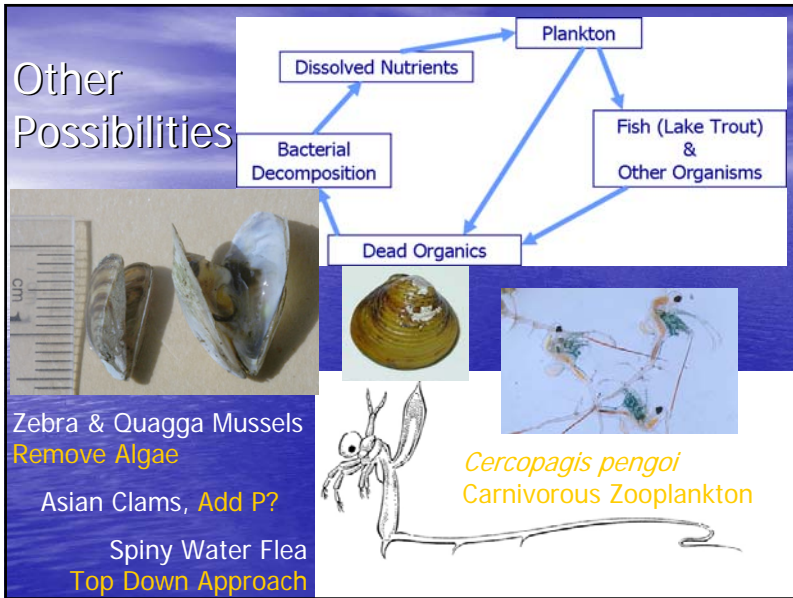
2007 Groton → County Line increase > 100 ppb TP & P

2005 – 2010 Finger Lake Ranks

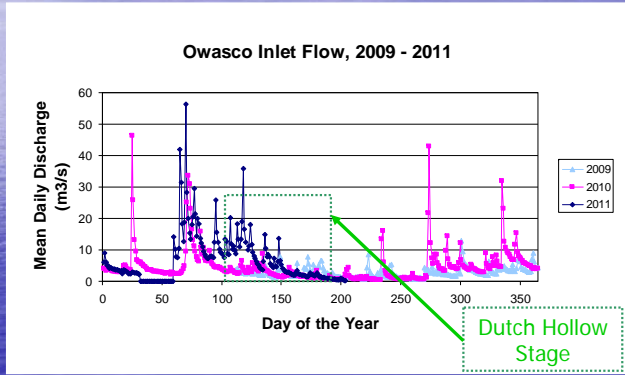


Water Quality Protect Legislation PLUS Runoff Agricultural Landscape



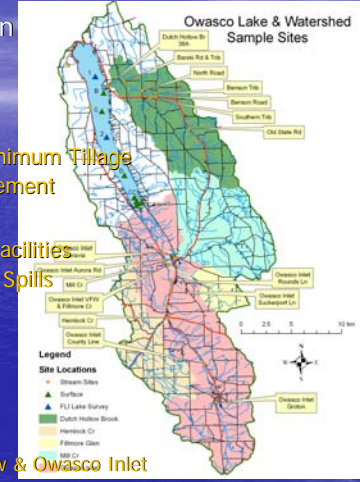


Owasco Inlet: Past Three Years

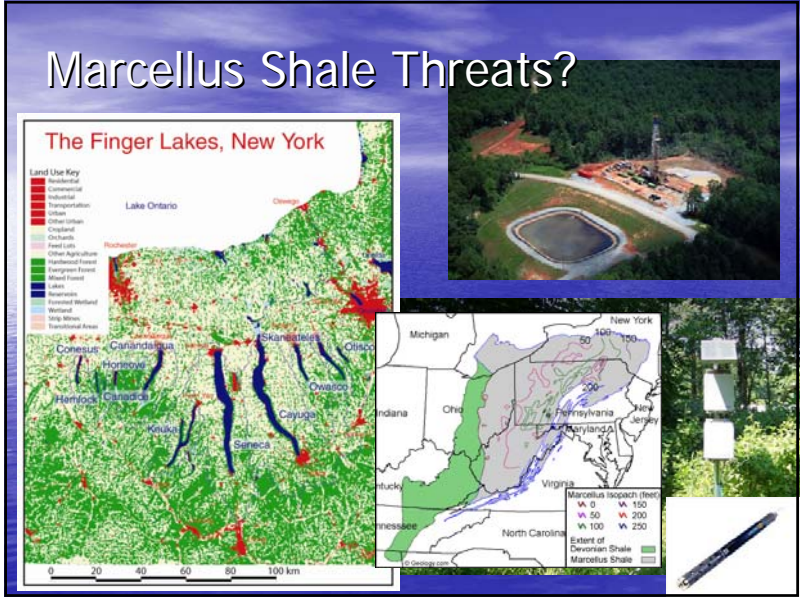


Owasco Recommendations

- Watershed Protection Legislation
- Owasco Inlet Floodplain
 - Remove Channelization
- Agricultural BMPs
 - Contour Plowing, Buffer Strips, Minimum Tillage
 - Agricultural Environmental Management
- Watershed Inspector
 - Inspects Onsite & Municipal WW Facilities
 - CAFO Manure Storage, Disposal & Spills
 - Information about BMPs
- Education, esp. K-12
 - Educate People so they Care!
- Monitoring
 - Nutrient Fluxes:
 - "R_DD₂", Stage & Flow Dutch Hollow & Owasco Inlet
 - New Threats – Marcellus Shale Drilling



Marcellus Shale Threats?



2011 Research Team

