Episodic Events - Great Lakes Experiment (EEGLE)

Program description

- Large inventories of chemicals (e.g., P, PCB) are stored in resuspendible sediments for over 25 years.
- EEGLE is testing how important storms are in re-exposing the lake to such chemicals.
- Current best estimate for Phosphorus is 18,000 MT/y from resuspended sediments vs 2-3,000 MT/y of new input.
- PCB resuspension is estimated at 1200 MT/y compared to 400 MT/y new input.
Resuspension Events are common to all of the lakes

Storms during the unstratified period remobilize constituents from the massive inventory in lake sediments
Episodic Events – Great Lakes Experiment EEGLE

What prompted the effort?

- One recommendation from a 1974 GLERL Research Workshop
- Over 20 years of effort and discussions among colleagues about sediment-water coupling.
- Questions about processes that could help interpret LMMB and earlier sediment and contaminant transport results.
Goal is to assess the impact of episodic events on the transport & transformations of biogeochemically important materials and on lake ecology

EEGLE’s main concepts can be easily communicated

Thickness of the Waukegan (~3500 years) formation. (IL Geological Survey, 1972)

Conceptual model of resuspension and transport
Beneath the surface, there is a rich complexity unfolding after many years of research and tools are emerging

- Post-depositional remobilization and long-term removal
- High-resolution hydrodynamic models and sediment-water exchange
- Coupling of ecological models with physics
- Observational tools that measure near-continuous fields of constituents

Data from Robbins, Edgington, et al.
EEGLE – What prompted the effort?
Time was right and tools (observational and modeling) were becoming available.

Recent evidence suggested that episodic events (e.g., storms, runoff-events, upwelling, lake ice cover, and thermal bar formation) have major and long-term impacts on ecosystems.

Incorporating episodic events into ecosystem models would help advance prediction of and management response to anthropogenic and natural perturbations to ecosystem structure and function.
EEGLE Program Development History

- July 1996 – Joint NSF – NOAA RFP
- Fall 1996 – no successful proposals
- Winter 1996-97 Successful proposal – funding initiated August 1997
- Field work: 3 years
- Synthesis (funded): 2-3 years
EEGLE total budget FY 98 – FY 02
$17M

- NOAA 50%
- NSF 40%
- EPA 7%
- Other 3%
Episodic Events – Great Lakes Experiment EEGLE

How was it coordinated?

An integrated proposal – serious peer review

Annual all-hands progress review and planning meetings

Informal, self-organized specialty meetings (funds available)

Special sessions at national/international meetings – open to others as well as EEGLE participants

One or more individuals who could represent the entire program at national/international committees and public presentations.

Minimal management structure and formal reporting
### EEGLE All-hands Meetings

- 2001 MTU – Houghton, MI
- 2000 Argonne Nat’l Lab
- 2000 Homestead – MI
- 1999 U MN – Minneapolis - **NSF Review Team**
- 1998 U MI – Ann Arbor
- 1998 U WI - Milwaukee

### EEGLE Special Sessions

- 2003 IAGLR – Chicago
- 2002 Ocean Sciences Meeting – Honolulu
- 2001 SIL – Melbourne
- 2000 Ocean Sciences – San Antonio
- 1999 IAGLR – Cleveland
- 1999 ASLO – Sante Fe
Scientific coordination - continued

**Data and information policy**

Data was formally archived at the end of the program

Data were only available to participants until 2003

Web based and easy user interfaces

Modeling and process work were interactive – this was not a program to build models, rather to use them in planning and synthesis – this also resulted in model improvements
Scientific coordination - continued

Data and information policy

All abstracts, presentations, posters, news releases, manuscripts and reports were put on the web ASAP

Draft manuscripts were circulated via the web

Speedy publications of results were encouraged

A Special Issue was requested by NSF rather late in the program – not too successful.
So, how does this contribute to the structure and management of a future program?

<table>
<thead>
<tr>
<th>Management-driven Program</th>
<th>Curiosity-driven Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agency/legislation-driven goal</td>
<td>Hypothesis focused proposal</td>
</tr>
<tr>
<td>Weakly peer reviewed</td>
<td>Strong (ongoing) peer review</td>
</tr>
<tr>
<td>Complex management structure</td>
<td>Mostly self-organization</td>
</tr>
<tr>
<td>Often IAGLR only</td>
<td>Open viewing at pre-eminent scientific meetings</td>
</tr>
<tr>
<td>Complicated QA/QC protocols</td>
<td>Data QA/QC relies on PI and Peer-reviewed publication</td>
</tr>
<tr>
<td>Identifiable Products</td>
<td>Information</td>
</tr>
</tbody>
</table>
Several Field Years are CRITICAL – funded time for SYNTHESIS is CRITICAL
Keys to building a new, interdisciplinary research program

• Identify clear objectives

• Program needs to be openly competitive to researchers inside and outside the Great Lakes community

• Build an integrated program from the beginning – lots of front-end coordination. IFYGL & EEGLE: 5+ years

• Incorporate serious peer review – in the proposal process and ongoing. An untapped resource may be the community of retired scientists

• Build in multiple field years as well as time for synthesis