CENTRAL QUESTION: What are the drivers and dominant scales of variability in planktonic communities?

- Projects 1-3: Stability-Composition (C. Carey, E. Gaiser, K. Muraoka)
- Project 4: Spring Blitz (L. Senerpont Domis, B. Ibelings)
- Projects 5: Storm Blitz (J. Stockwell, O. Anneville, E. Nodine)

Projects 5: Regional Assessment of Zooplankton (D. Straile, S. Arnott, J. Stockwell)

- Projects 6: $C_{\text{Max}}$ (B. Beisner)
- Projects 7: Fitness Landscapes (M. Thomas)

PROGRESS:
• Discussed progress on plankton counts
• Filled in spreadsheet to track data
• Set goals and mechanisms for completing counts in 2015
• Many new projects may utilize these data
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Storm-Blitz

- **Green Status**
- Post-Doc/PhD student actively working on project
- Full proposal due in December for GEISHA Project (data analysis)
- 19 Lakes – **looking for more lakes** (min. two samples/month and min. 5 years)
- Phytoplankton composition, thermal profiles, and meteorological data
Regional Assessment of Zooplankton

Z-PEG: Empirical support for the Plankton Ecology Group (PEG) Model?

**PEG Prediction**
- Date of Zoop biomass peak
  - Oligo vs. TP vs. Eutro
- Lag of Peak Cross Correlation
  - Oligo vs. TP vs. Eutro

Graphs showing biomass peaks and correlations in eutrophic and oligotrophic conditions.
RAZ: Regional Assessment of Zooplankton

• What are important drivers of zooplankton across >1000 lakes in the U.S. from the EPA National Lakes Assessment (NLA)?

• Potential drivers:
  • Temperature
  • Nutrients
  • Phytoplankton
  • Land use
  • Many more…

• Are drivers different in natural lakes vs. reservoirs?
• Copepod/Cladoceran size and dominance relationships across temperature and nutrient gradients?
• Do relative important drivers differ across different regions of the U.S.?
Questions

- Is the subsurface CM associated with thermocline depth or light?
- Is subsurface CM frequency effected by:
  - Trophic state
  - Transparency
  - Size
  - Depth
Chl fluorescence, temperature and light (profiles or secchi)
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Fitness Landscapes


Fitness landscapes across multiple dimensions of environmental variation

• Ecological theory developed around fitness, but community studies focus on abundance
• Lab data constrains relationships between fitness and environment
• Goal: test ecological theory and improve prediction of community dynamics using growth rates estimated from time series data
Today's population is yesterday’s population multiplied by some function of the environment

\[ x_t = x_{t-1} \cdot \mu(I, T, N, P, Z) \]

The nature of that function is a hypothesis that can be tested.
Extract response to multiple environmental dimensions in all species in a community.

Phosphate concentration

Growth rate

Temperature

Phosphorus
Data we are looking for:

1) Phytoplankton species counts
   – at least once per 2 weeks
   – surface / specific depths / mixed layer
2) Temperature
3) Light
   – \( I_z / I_o / k_d / \text{Secchi depth} \)
4) \( \text{PO}_4 \)
5) \( \text{NO}_3 \)
6) Zooplankton counts
   – Bulk / taxon specific
7) Si
8) \( \text{NH}_4 \)