

Corbicula Transplant Studies

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Can Corbicula be used as biomonitors to identify locations of interest with respect to mercury in the South River?

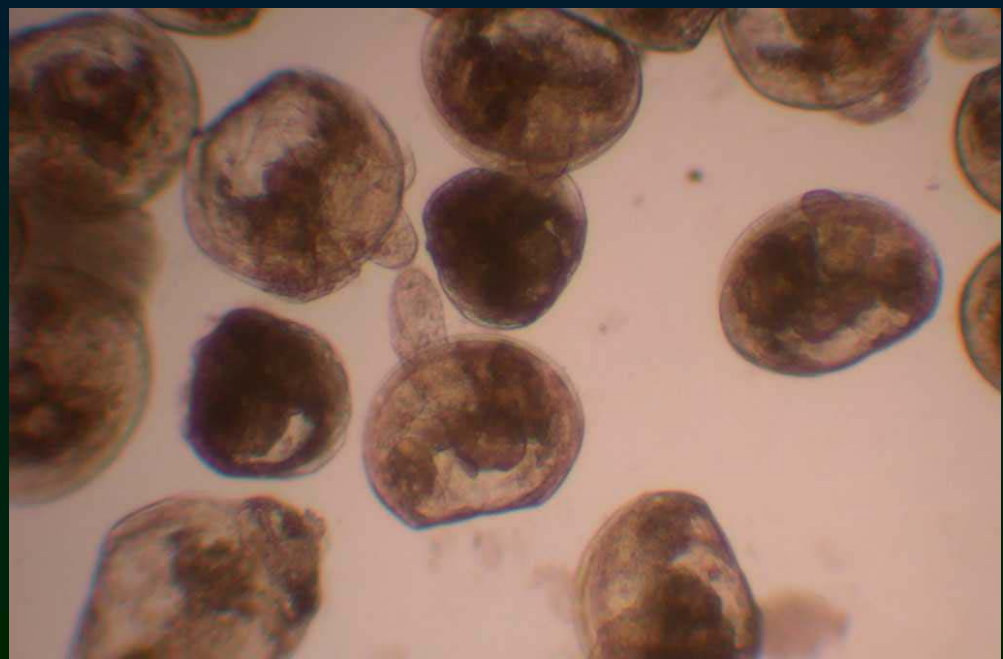
- **Pilot Study & Seasonal Data: Doug**
- **Plant Reach Study: Tom**

Why use transplanted Corbicula?

- Transplanted *Corbicula* could be used to monitor mercury levels at any river site, rather than only where *Corbicula* is currently found.
- Using transplants provides increased control of exposure conditions.

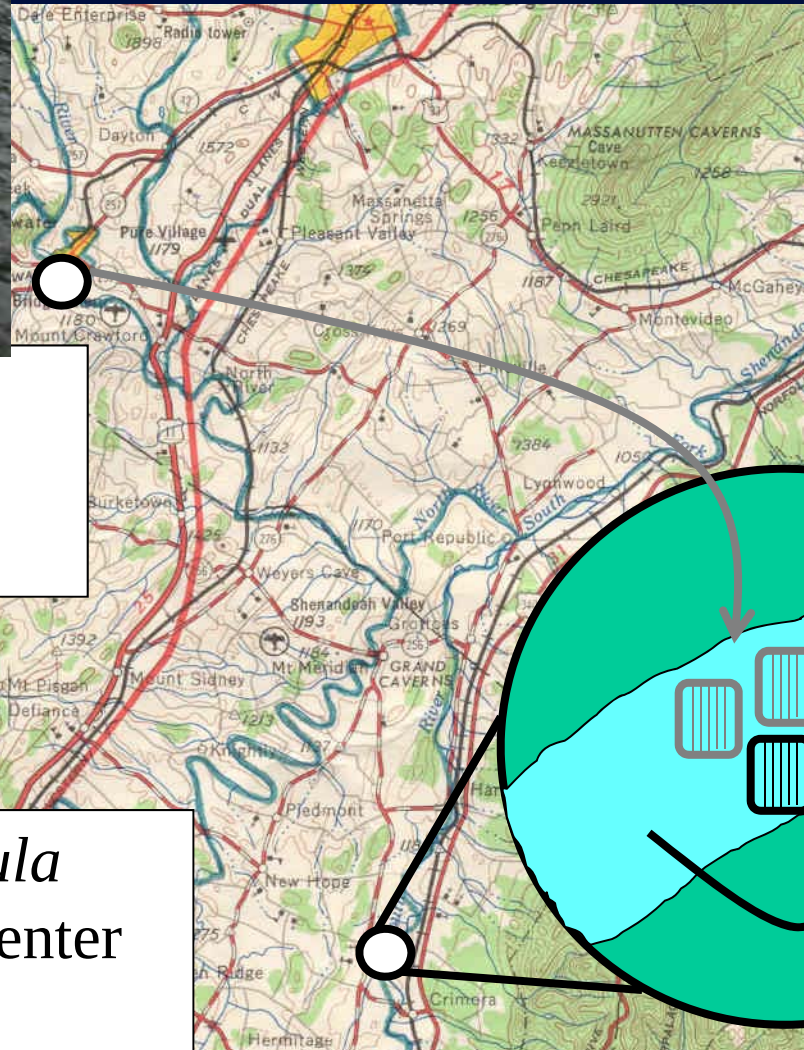
Corbicula Natural History

- High biomass
- Filtration rate is high
- Able to filter bacteria (unlike many other bivalves)
- Relatively mobile
- Short life span (2-3 yr) with periodic mass die-offs
- Probably lower tolerance for stress than native clams
- High production of “pedi-veligers” during reproduction





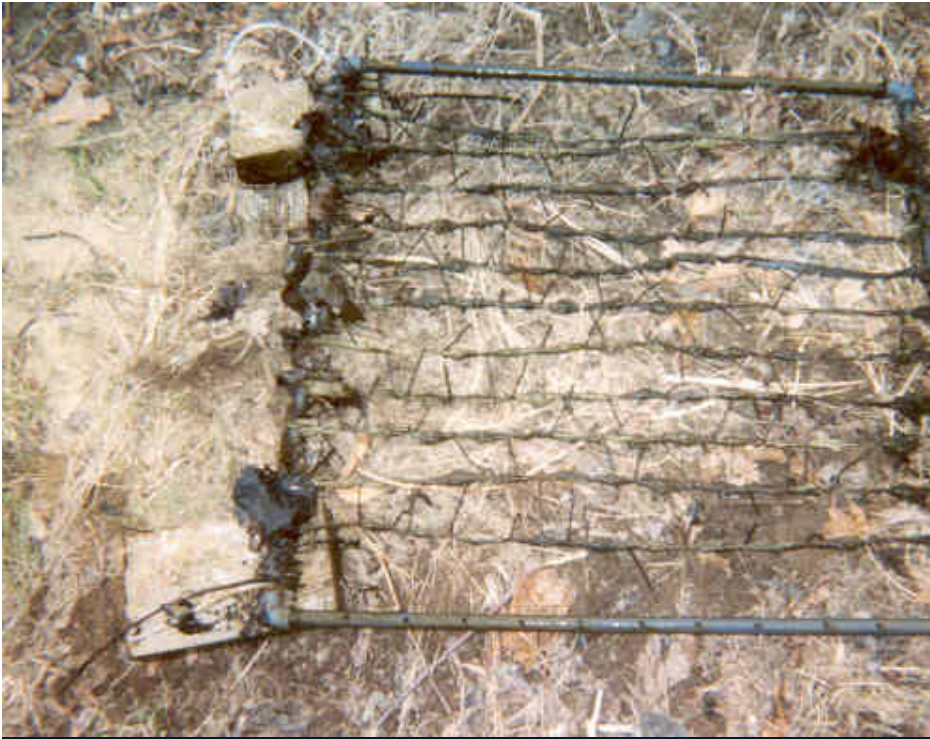
Transplant group of *Corbicula*
from North River to cages at
Augusta Forestry Center



Control group of *Corbicula*
from Augusta Forestry Center
moved into cages.





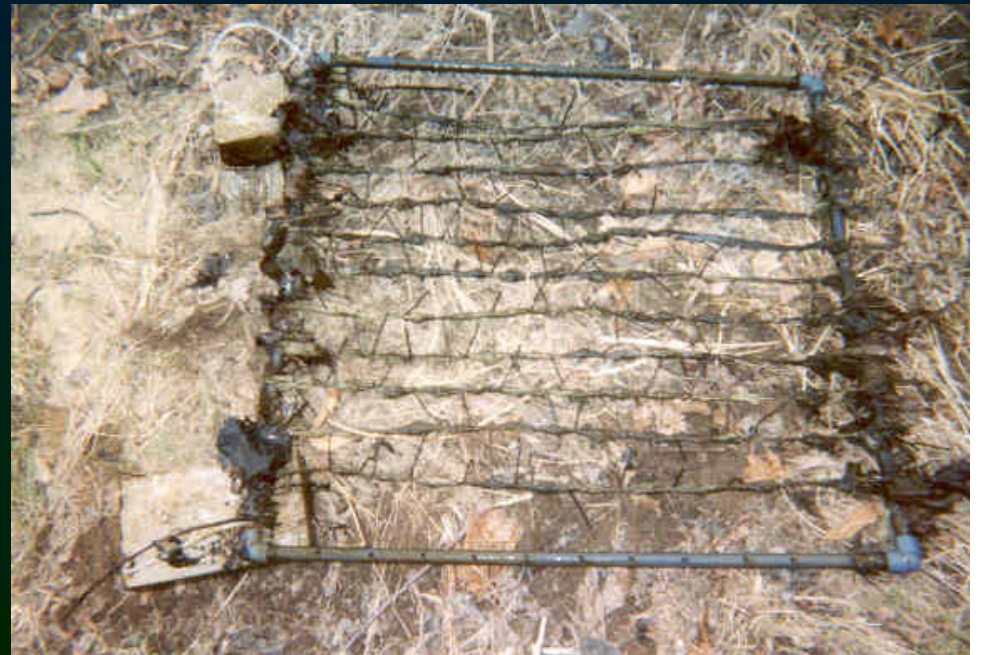


Monthly Sampling of cages from 11-27-03 to 8-24-04 (subsequent sampling of uncaged clams to present)

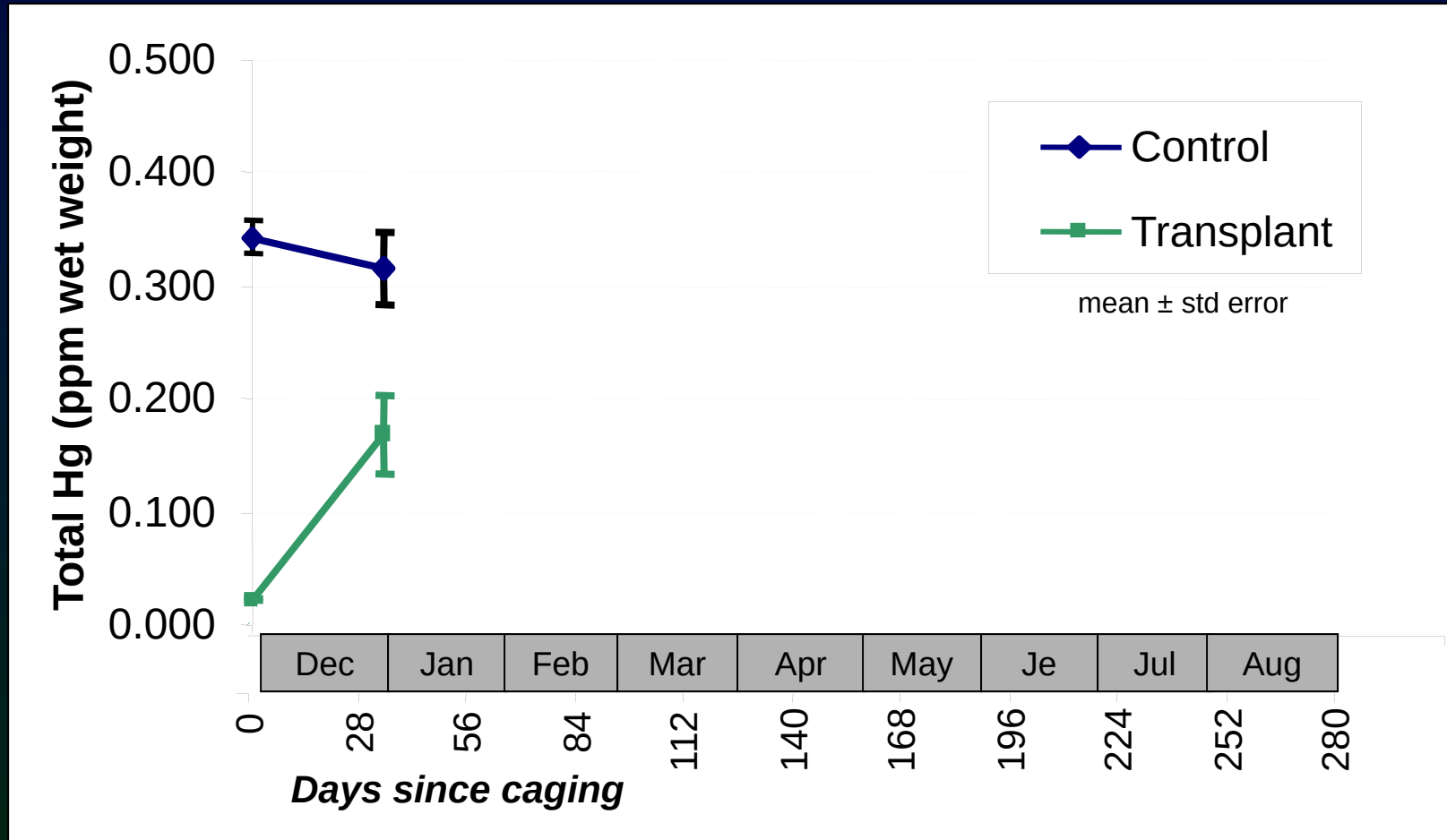
- Ten clams (making 1 composite sample) from each of six cages (three control and three transplant)
- Clear GI tract 48 h prior to shucking
- Mass and length data collected for growth parameters

Observations on caging technique

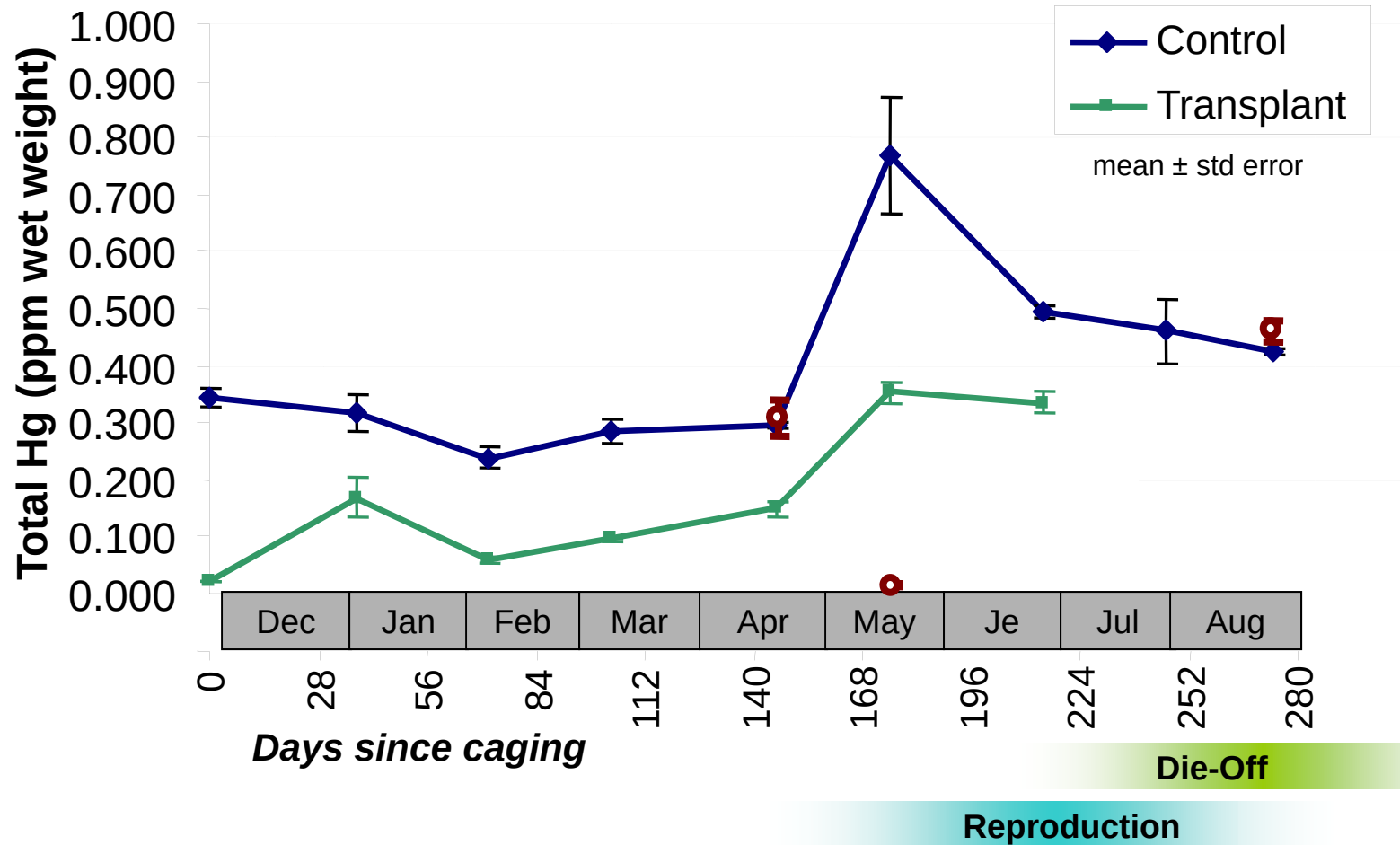
- Usually off sediments, but sometimes buried long periods without mortality in winter/spring. Higher mortality in summer.
- Cages shift during high flow
- Algae and/or bacteria proliferate on mesh



Results of monthly sampling

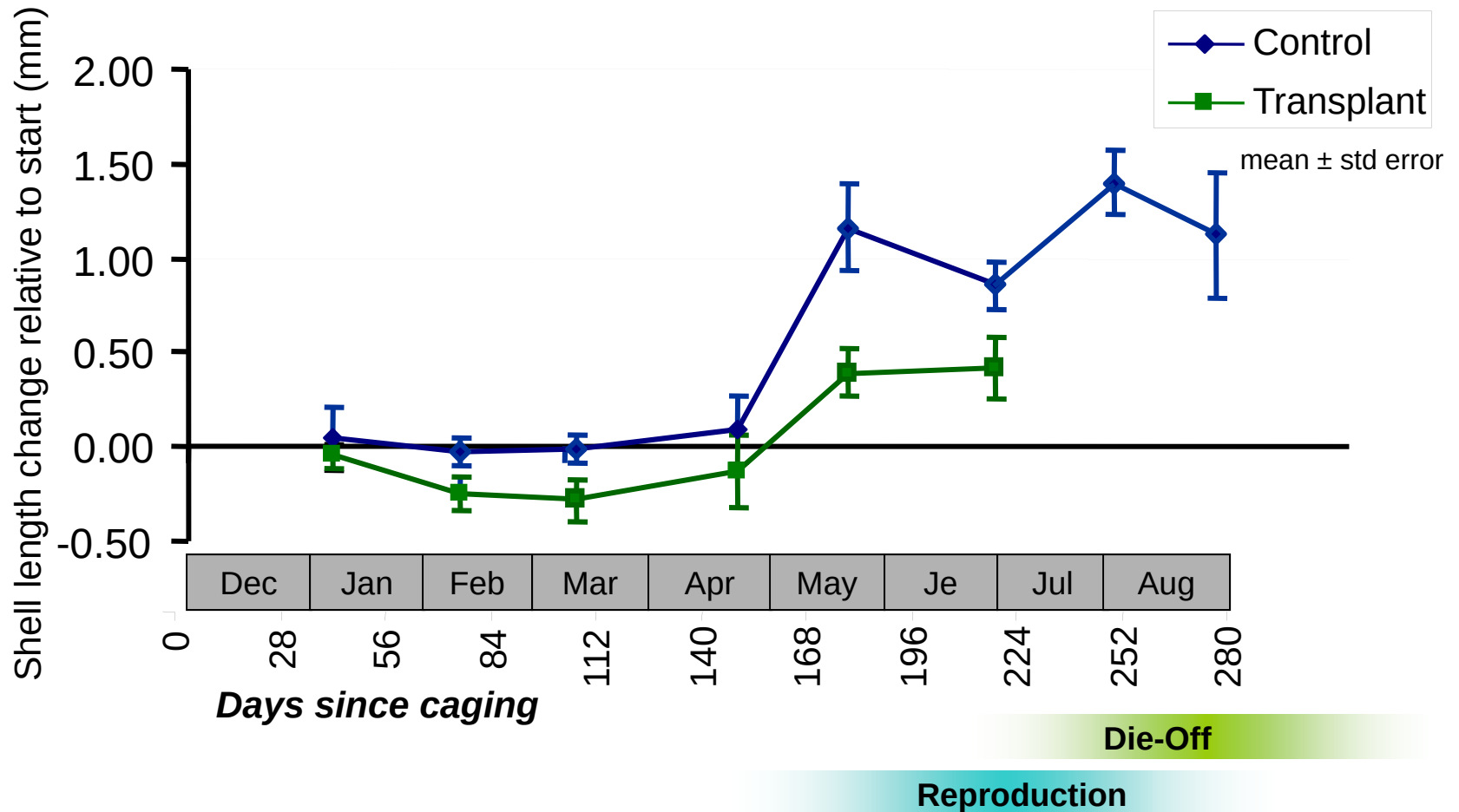


1. Initial rapid uptake by transplanted clams

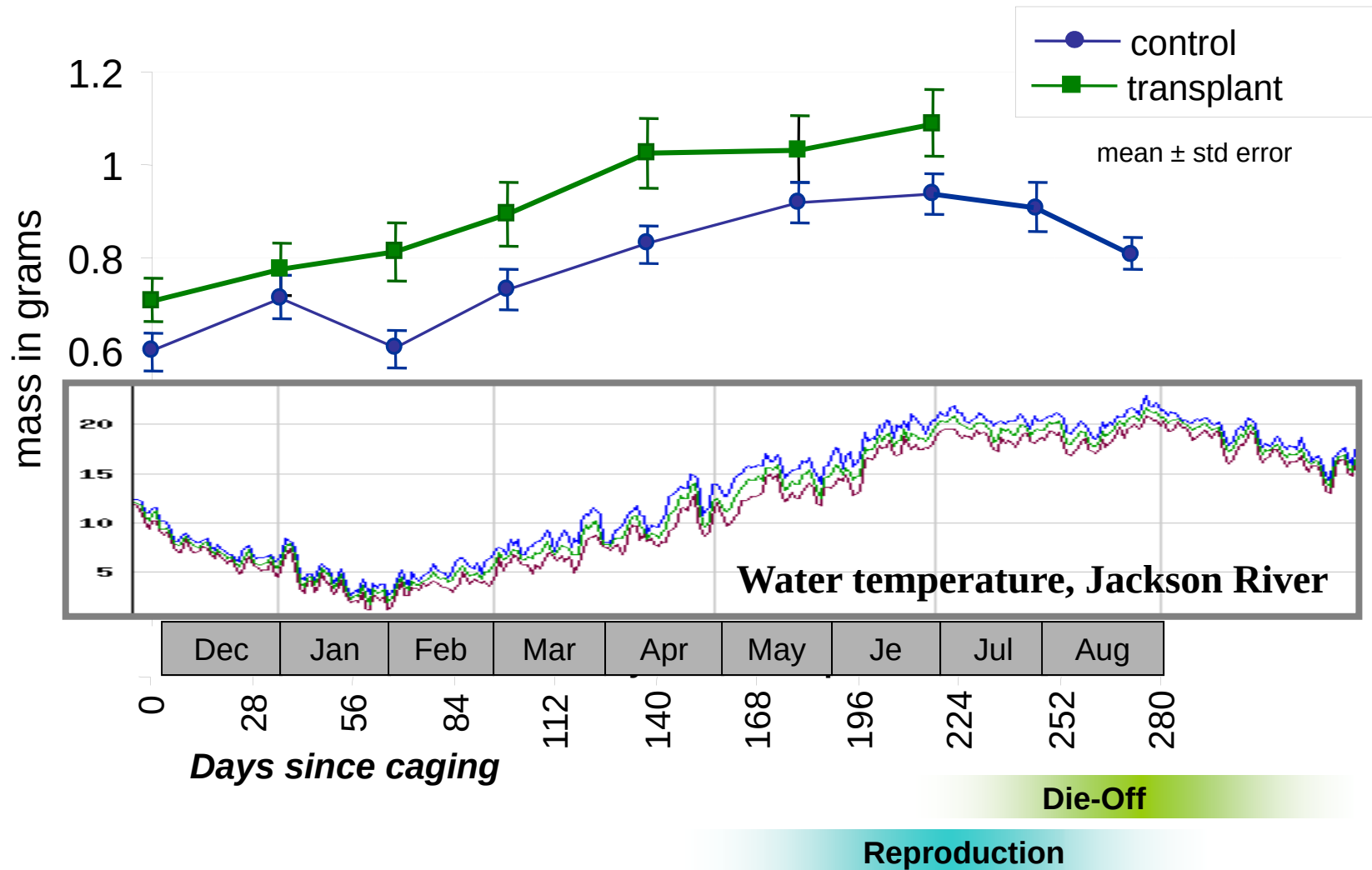


2. Later fluctuations over short time periods
3. Transplanted clams never accumulated as much as controls
4. Mercury in control clams was unaffected by caging

How does growth affect mercury uptake?

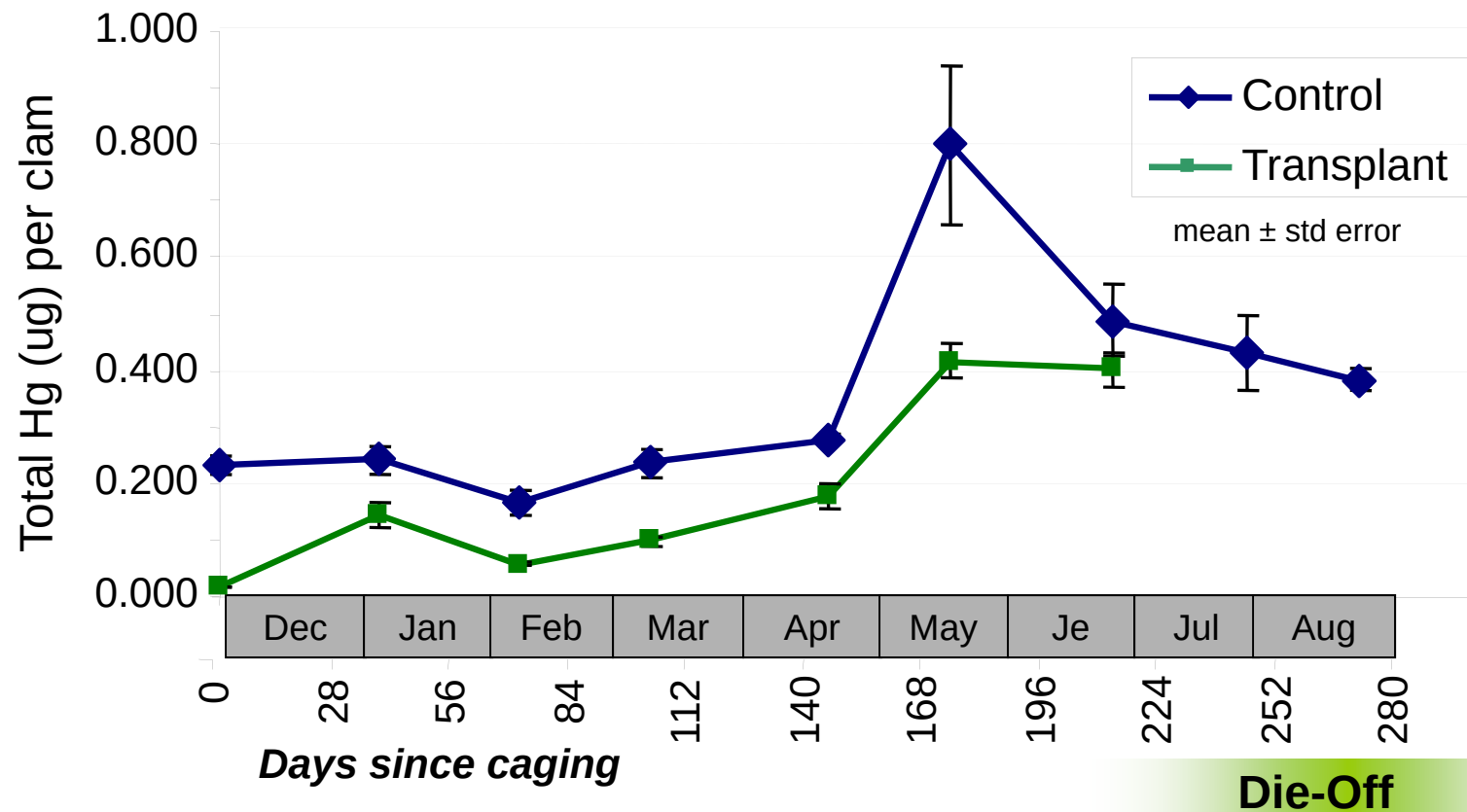


1. Length increase occurs primarily in late April/early May, corresponding to the start of reproduction



1. Most of tissue growth occurred before reproduction
2. Tissue growth continued in coldest time of year

Do these growth events correspond to mercury changes?



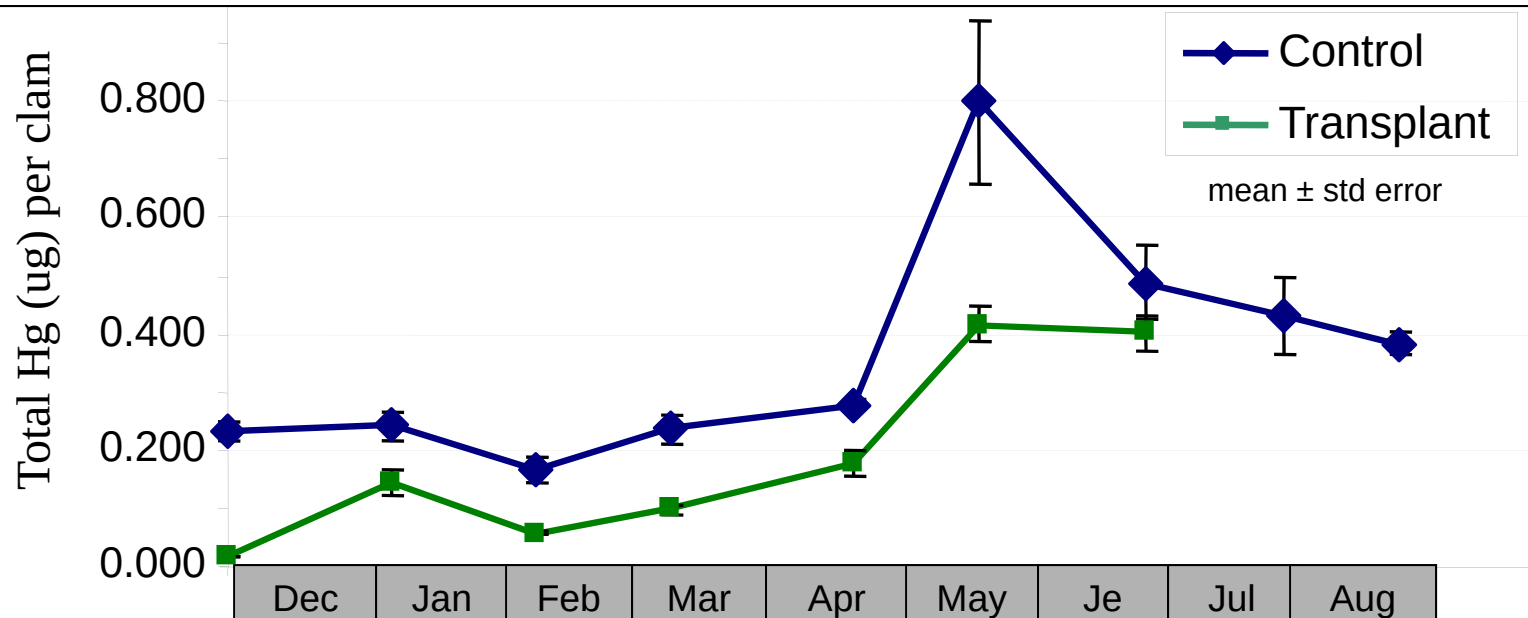
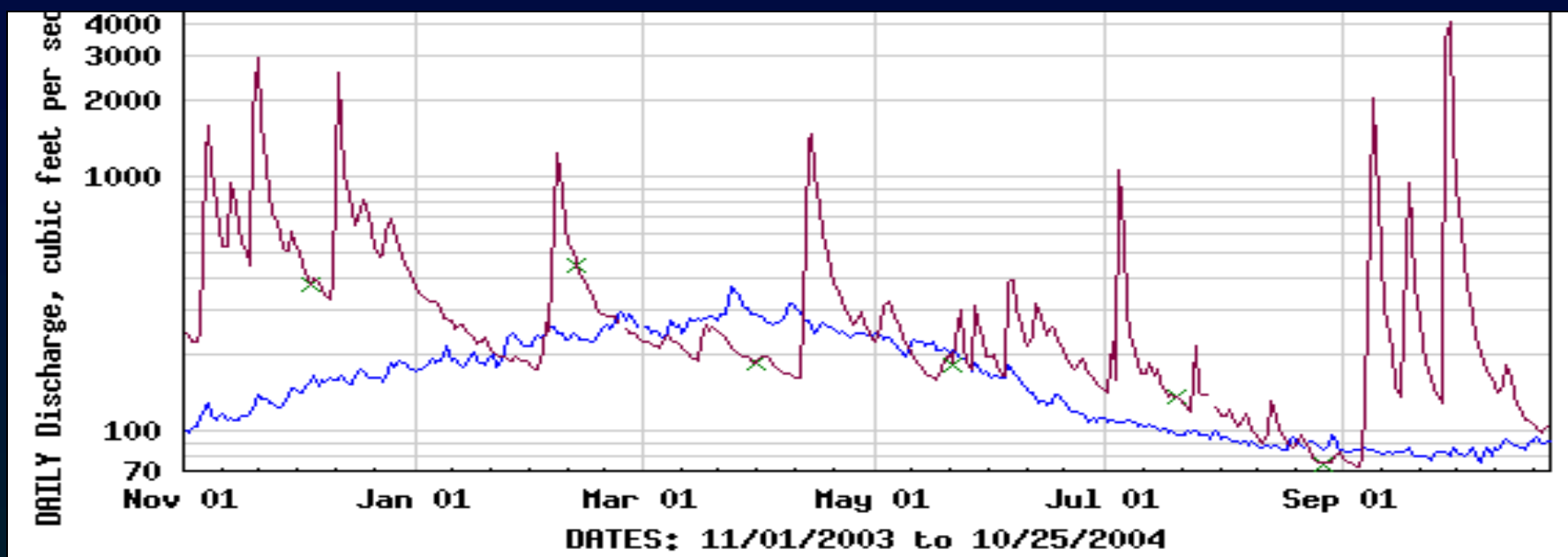
Shell Growth

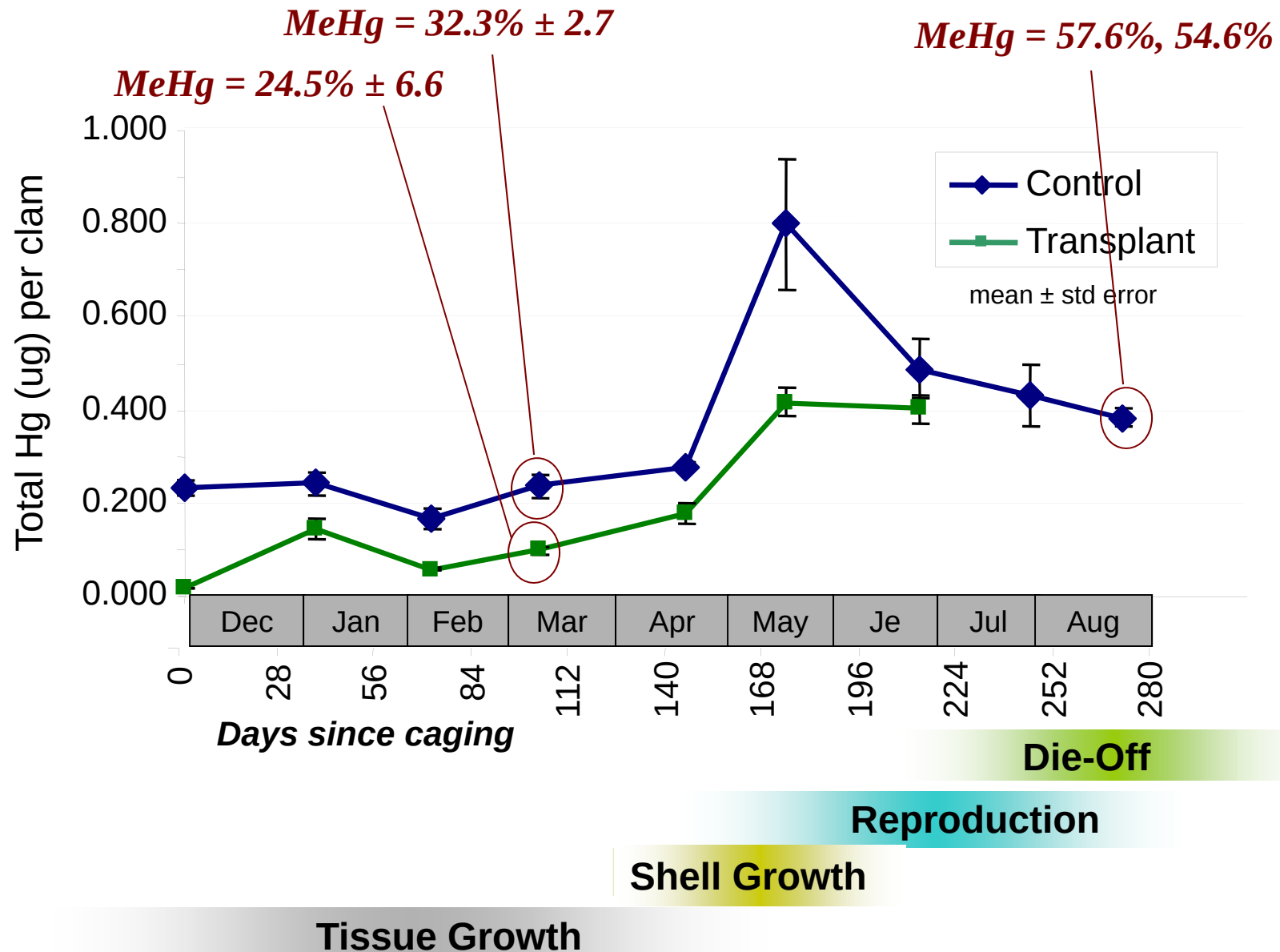
Reproduction

Die-Off

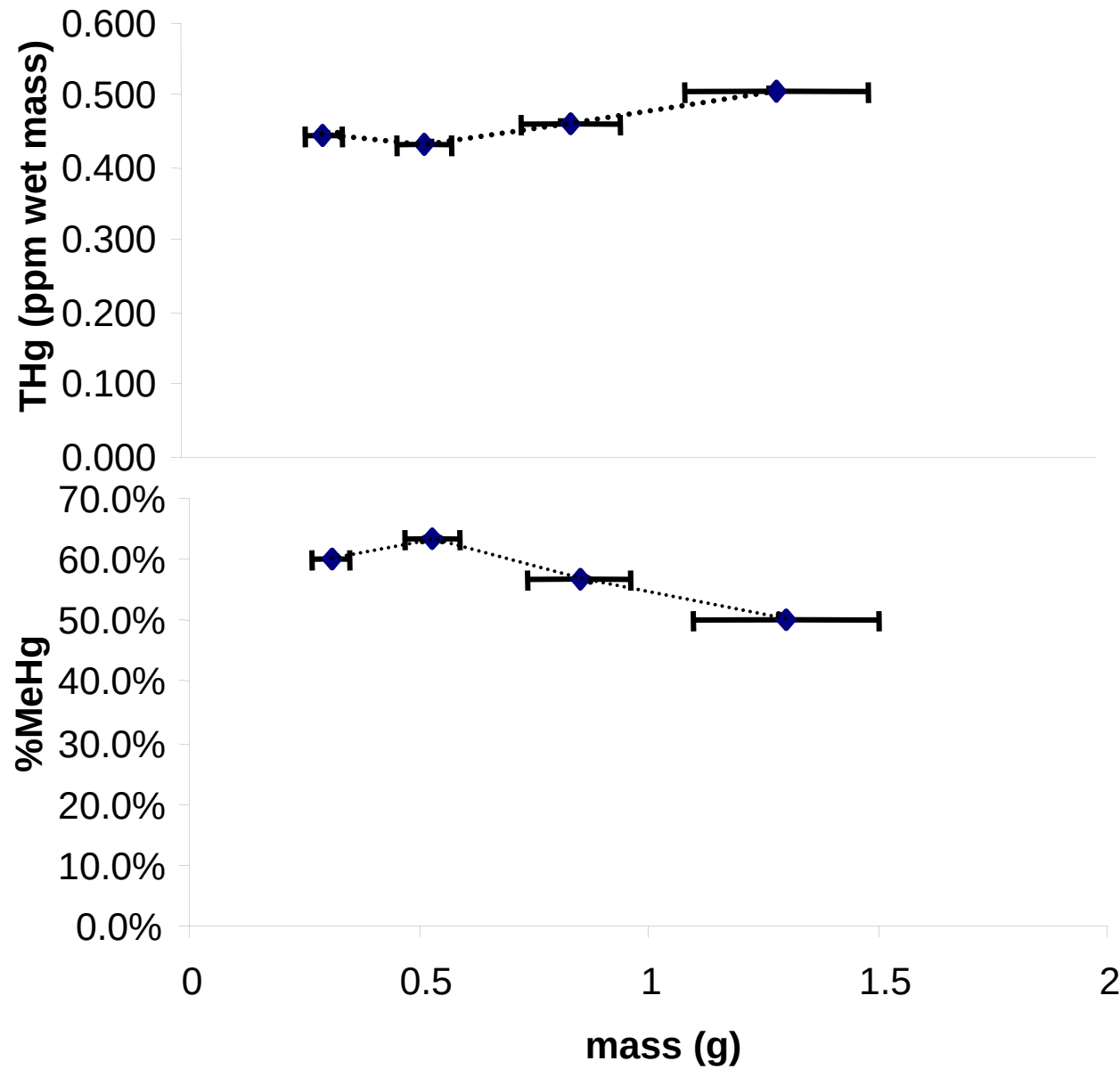
Tissue Growth

Do high water events correlate with mercury changes?





- Percent MeHg was greater in August than in March



- Size had little effect on mercury contents (in August)

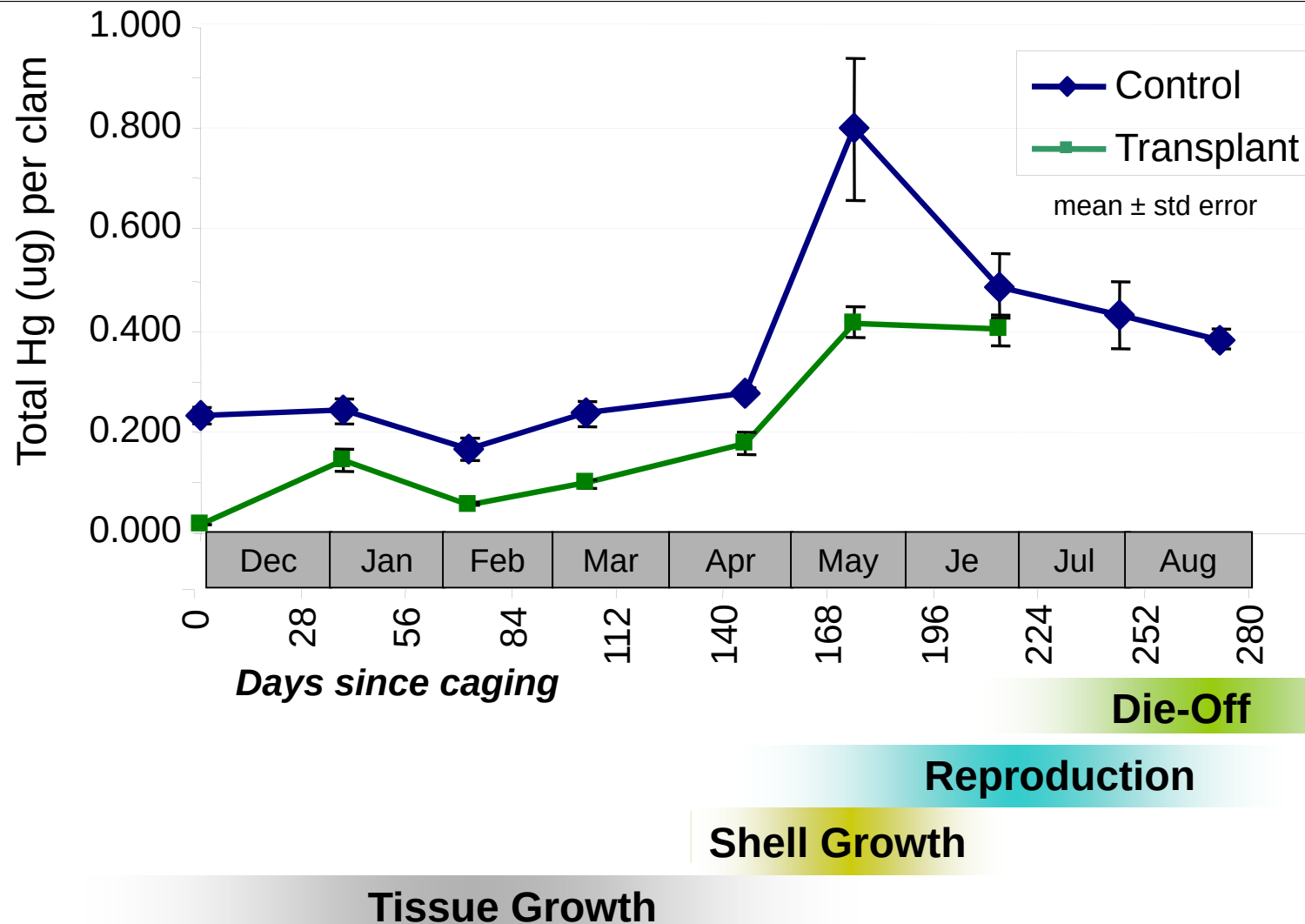
Can transplanted *Corbicula* be used as a biomonitor?

- Abundant
- Good survival
- Cages are reasonably stable
- Mercury is rapidly accumulated



Suggestions:

- Timing makes a difference: Optimal period is May to July?
- Two months could be sufficient for uptake



Suggestions for future work:

- Monthly sampling for long-term trends
- What does % MeHg tell us?
- Refine rates of uptake & washout

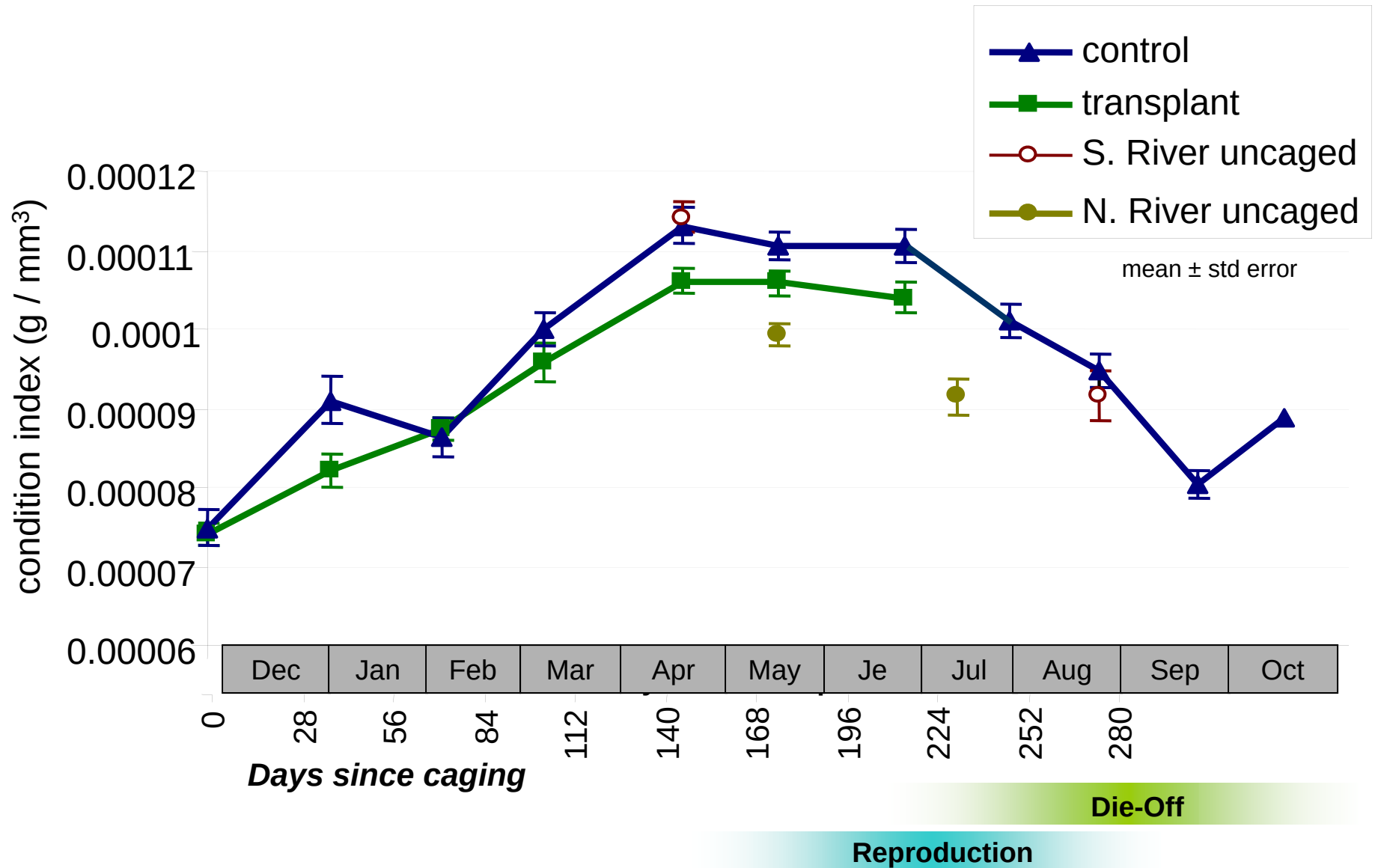
Thanks to:

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EMU students:

- Andrew Dutcher
- Andrew Foderaro
- Daniel Brubaker
- Cheryl Heatwole





“Condition index” increases into spring, decreases thereafter

