

Bloom in a bottle experiment

Jimmy Saw

Luis Bolaños

SMILE workshop

01/27/2017

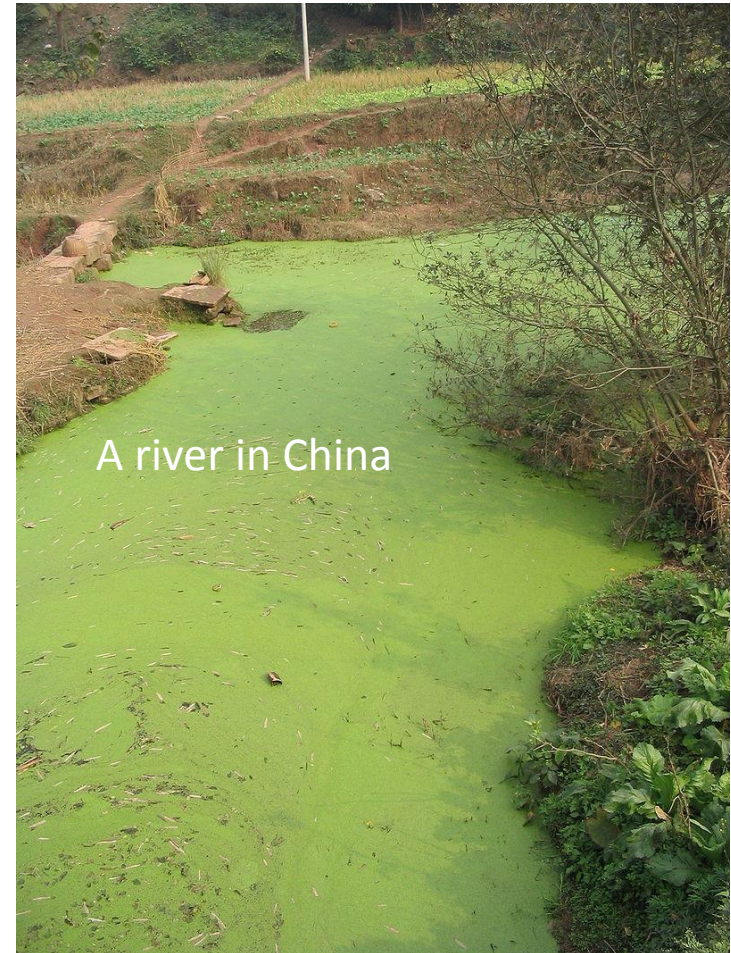


What are phytoplankton blooms?

- Rapid accumulation of photosynthetic organisms in water
- A large amount of phytoplankton in one centralized area, appearing green or brown
- Heavily dependent on nitrate, phosphate, and iron availability



<http://earthobservatory.nasa.gov/NaturalHazards/view.php?id=88340>

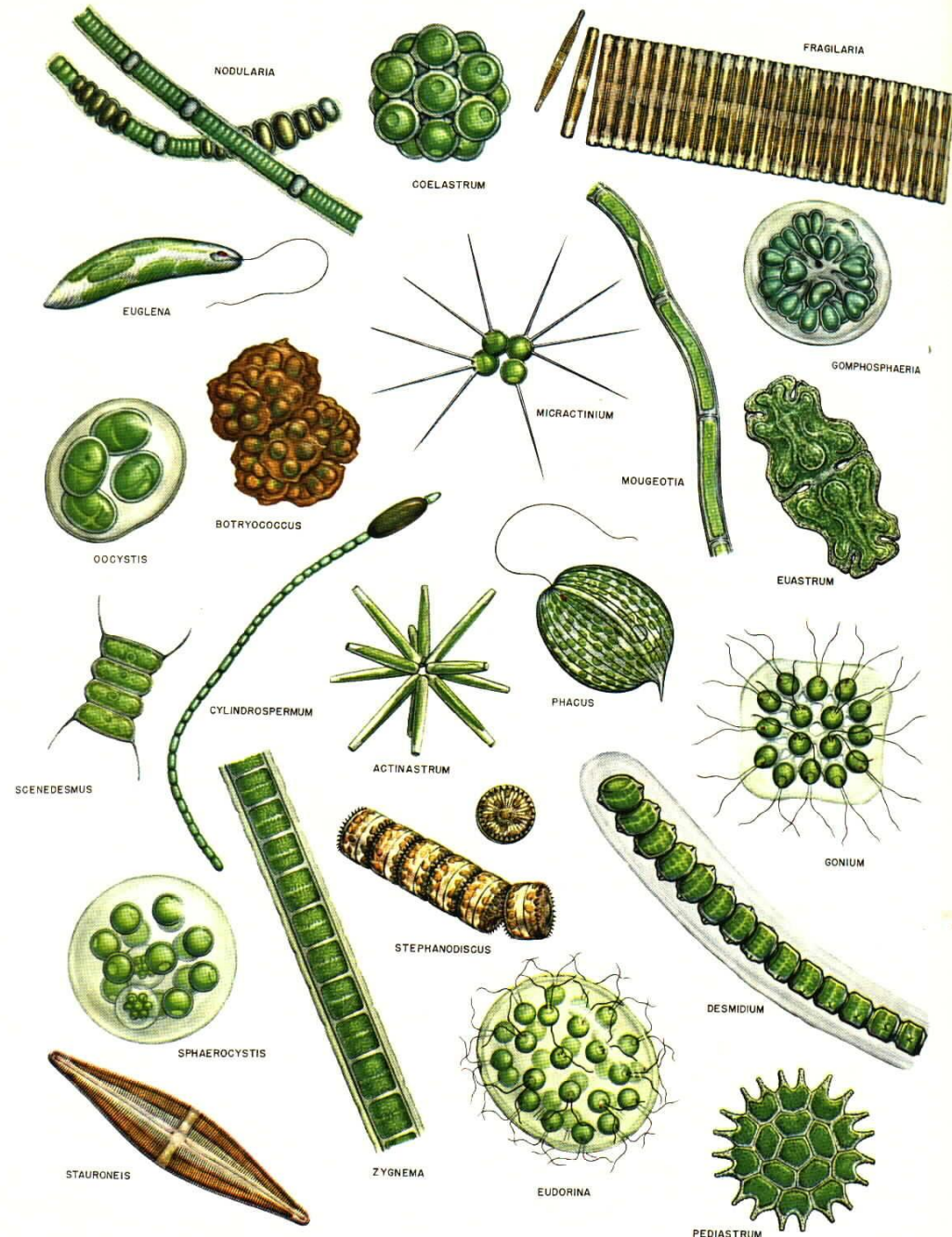


https://commons.wikimedia.org/wiki/File:River_algae_Sichuan.jpg

What are phytoplanktons?

- Microscopic autotrophic organisms
 - Diatoms
 - Algae
 - Cyanobacteria
- Require light and nutrients (such as N, P, Fe) for growth
- Large contributor to the primary production in aquatic and marine environments

PLANKTON AND OTHER SURFACE WATER ALGAE



Goals of the experiment

- To simulate small-scale phytoplankton blooms in the lab
- To assess levels of bloom with varying types of nutrients and quantities
- To observe the differences in biomass with different levels of nutrient input

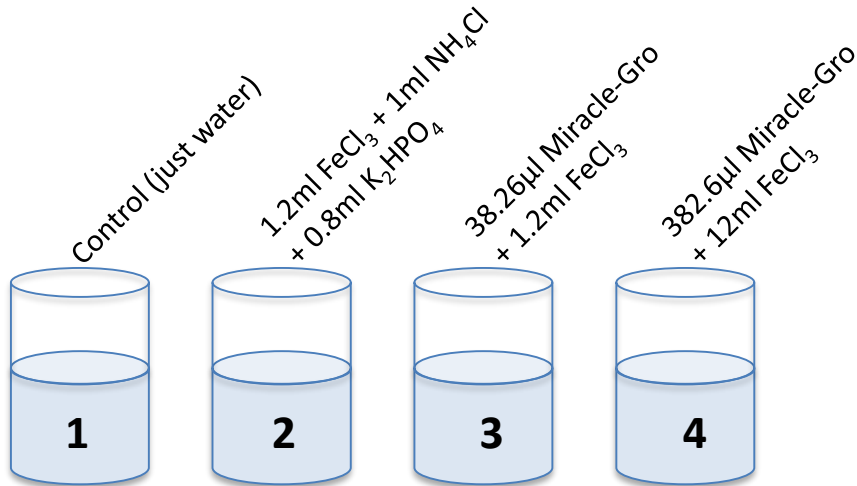
Experimental setup



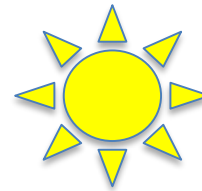
Freshwater from Willamette River



Seawater from Newport



500ml of **river water** in each bottle

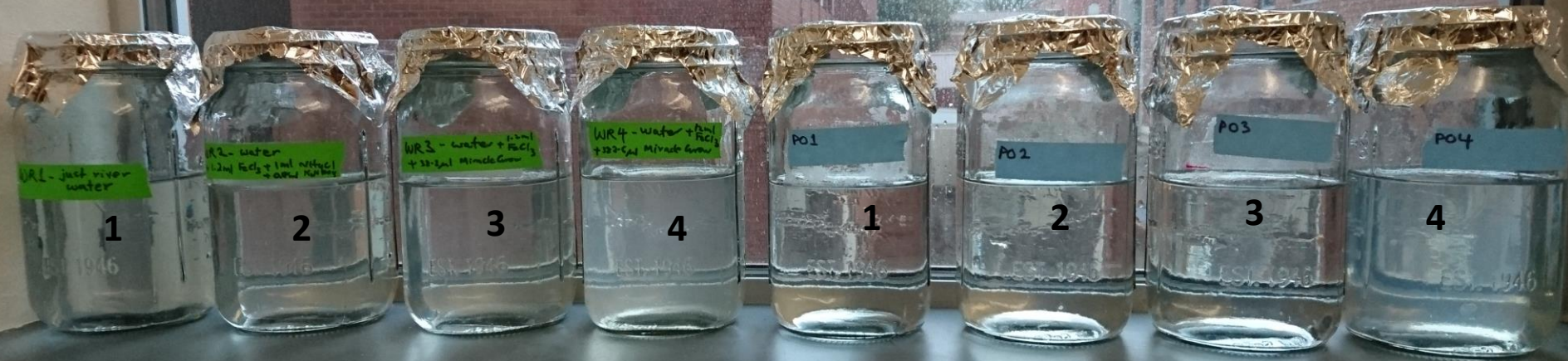


500ml of **seawater** in each bottle

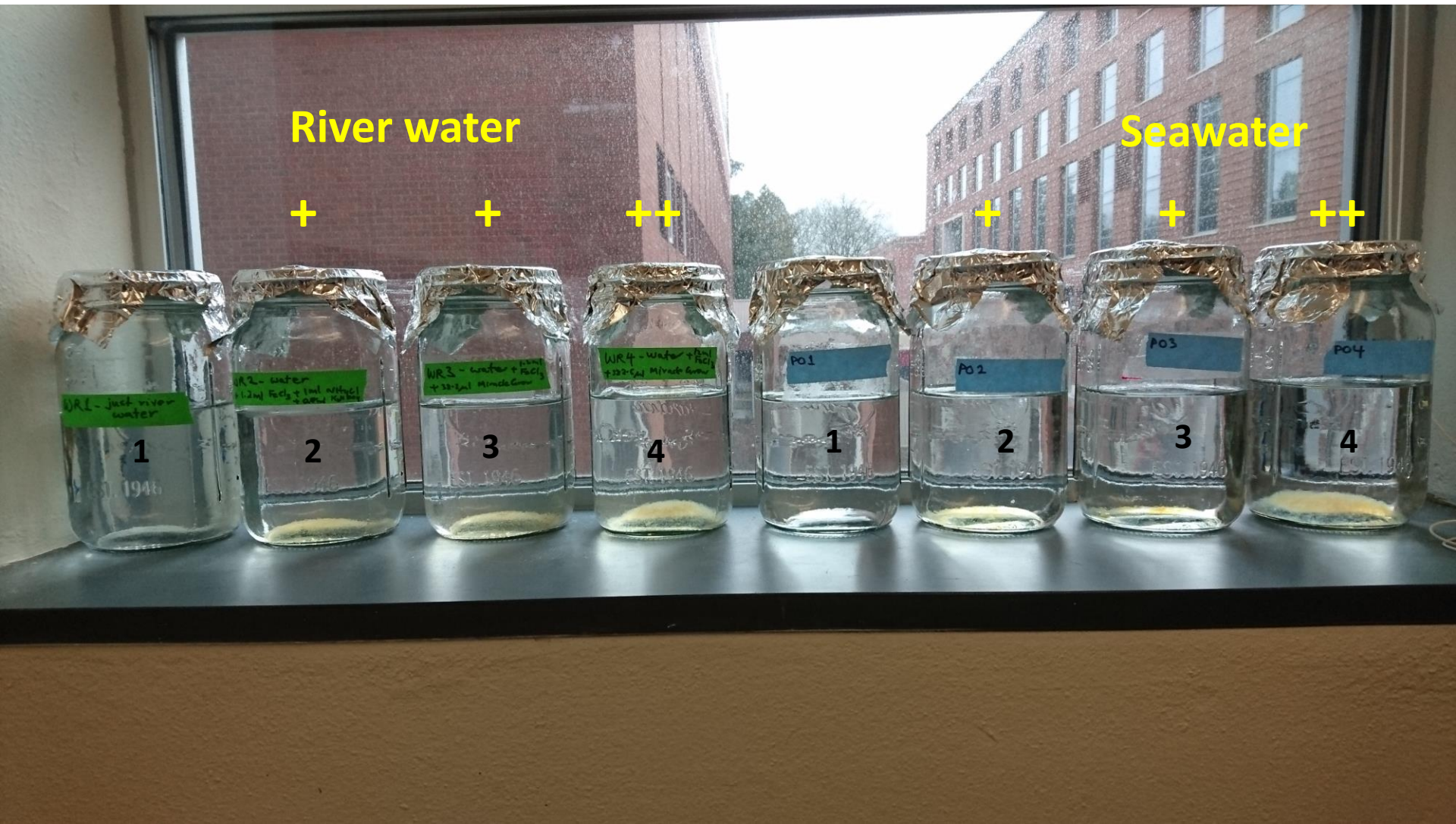
Results: Day 1 (01/18/2017)

River water

Seawater

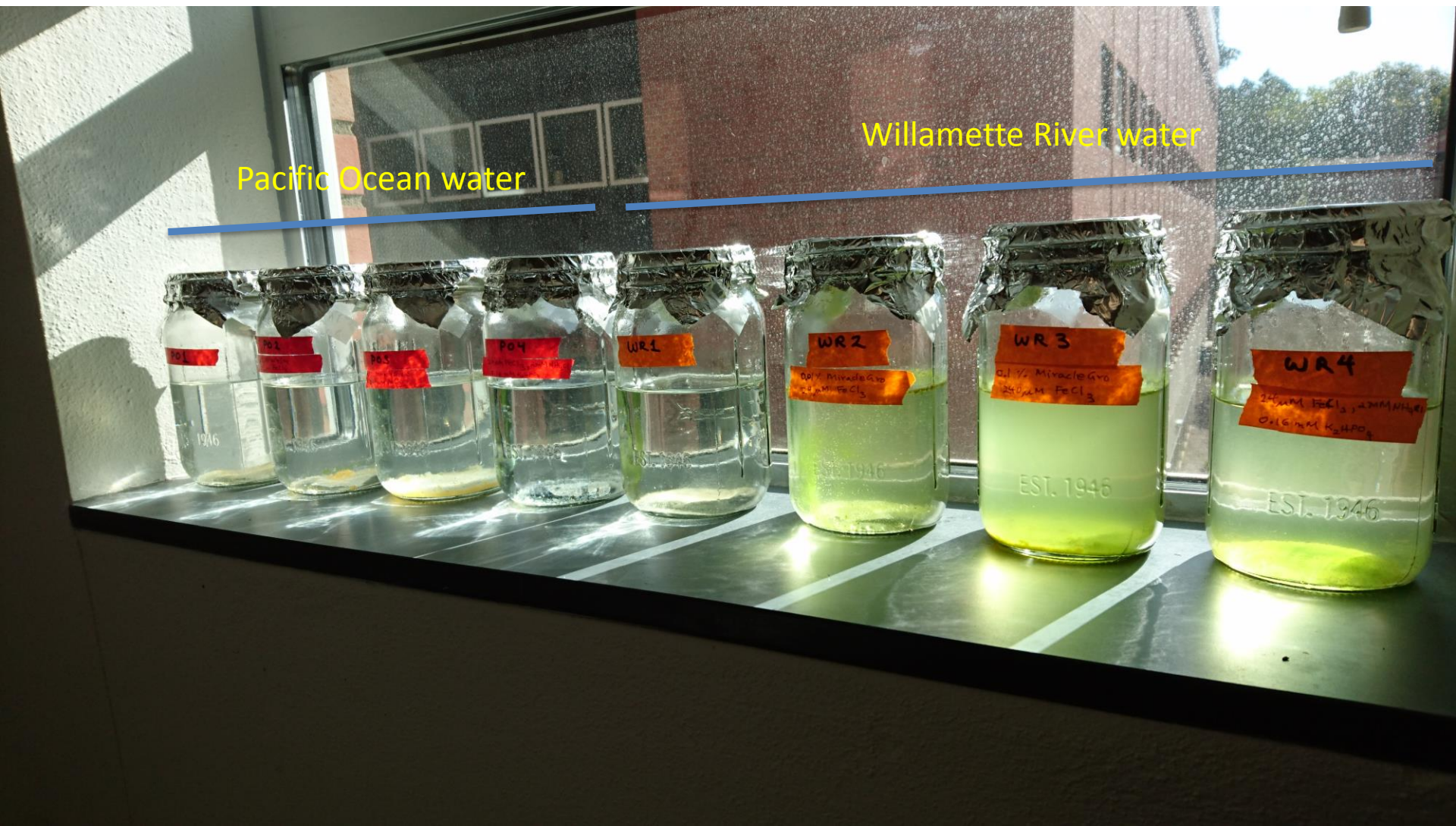


Results: Day 8 (01/26/2017)



Results from last year

After 3 months



Results from last year

After 3 months



Recommended procedure

- Water from a natural water source (~500mL)
- 38.26 microliters MiracleGro LiquaFeed
- 1.2mL of FeCl_3
- One Drop from Dropper = 40 microliters
 - 1 Drop of MiracleGro LiquaFeed
 - 30 Drops of FeCl_3

Acknowledgements

- Michelle Michelsen
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- Jing Sun