Whole lake mega-sampling for 222/221: To be sampled once in Aug 2012 \*sampled periodically over the summer

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| **Location** | **Ag** | **CNP and chemistry** | **Natural abundance 15N/13C** | **Density, biomass, abundance, other** | **function** |
| **Epilimnion**  222=1.5  221=1.5 | **TAg\*:** 30mls screened water in 4% nitric acid  **DAg\*:** 10mls water filtered with 0.2um polycarb filter in 4% nitric acid  **Seston Ag\*:** 35um-0.8um fraction (on 0.8 polycarb filter in 4% nitric acid)  **BP Ag\*:** 1.2-0.8um fraction (on 0.8 polycarb filter in 4% nitric acid)  **35-1.2um fraction\*:** 500ml filtered through 1.2um polycarb filter. Save in 4% nitric acid  **1.2-0.2um fraction\*:** filter 100ml 1.2um filtered water through 0.2 polycarb. Save in 4% nitric acid  **Zooplankton Ag\*:** zoop biomass >80um from known vol. dried and saved in 4% nitric acid.  **Do we want different sizes? Rotifers and pred zoops?** | **Dissolved nutrients\*:** 0.2um polycarb filtered (with 0.7GFF prefilter) water saved for DOC, TDN, NH4, NO3, NO2, TDP, TP.  **Seston CNP\*:** screened water filtered on 0.7GFF.  **BP CNP\*:** 1.2 prefiltered water filtered on 0.7GFF.  **Profiles\*:** light, DO, temp with depth. **Do we want cond, alkalinity, Cl, S, pH?** | **Dissolved 15N:** 1L of 0.2um polycarb filtered (with prefilters) water. Freeze. Take 3 reps per lake.  **Dissolved 13C:** 1L of 0.2um polycarb filtered (with prefilters) water in glass amber bottles. Fridge. Take three reps per lake.  **Seston 15N/13C:** screened water filtered on 0.7GFF.  **BP 15N/13C:** 1.2 prefiltered water filtered on 0.7GFF.  **Zooplankton 15N/13C:** zoop biomass >80um from known volume dried. **Do we want different sizes? Rotifers and pred zoops?** | **Pigments\*:** use GFF prefilter from dissolved nutrients. Freeze.  **Seston Chla\*:** screened water through 0.7GFF. Freeze.  **BP Chla\*:** 1.2 filtered water through 0.7GFF. Freeze.  **BP DNA\*:** 100mls 1.2 prefiltered water through a 0.2um polycarb. Filter frozen.  **BP abundance\*:** 4mls screened water in cryovials with formaldehyde.  **Algal abundance\*:** 125ml screened water in lugols  **Fatty acid profiles?**  **Zooplankton abundance\*:** preserve zoops >80um from known vol in sugar formalin. **Do we want different sizes? Rotifers and pred zoops?** | **N uptake:** spike screened water in light and dark whirl packs with 15N. Incubate in lake for 24h. Filter for seston (0.7GFF) and BP (1.2-0.7um). Save filters. 3 reps per light/dark per lake.  **Nitrification:** save water from uptake bags. Freeze for 15NO3 analysis. Spike before freezing.  **N fixation?**  **Denitrification?**  **BP production\*:** 3H-leucine assay. 3 reps + killed sample  **BP respiration\*:** CTC uptake assay. 3 reps.  **Whole lake metabolism\*:** Scott’s autosamplers. |
| **Hypolimnion**  **222 = 4.5m**  **221 =4.0** | **TAg:** 30mls screened water in 4% nitric acid  **DAg:** 10mls water filtered with 0.2um polycarb filter in 4% nitric acid  **Seston Ag:** 35um-0.8um fraction (on 0.8 polycarb filter in 4% nitric acid)  **BP Ag:** 1.2-0.8um fraction (on 0.8 polycarb filter in 4% nitric acid)  **35-1.2um fraction:** 500ml filtered through 1.2um polycarb filter. Save in 4% nitric acid  **1.2-0.2um fraction:** filter 100ml 1.2um filtered water through 0.2 polycarb. Save in 4% nitric acid | **Dissolved nutrients:** 0.2um polycarb filtered (with 0.7GFF prefilter) water saved for DOC, TDN, NH4, NO3, NO2, TDP, TP.  **Seston CNP:** screened water filtered on 0.7GFF.  **BP CNP:** 1.2 prefiltered water filtered on 0.7GFF.  **Profiles:** light, DO, temp with depth. **Do we want cond, alkalinity, Cl, S, pH?** | **Dissolved 15N:** 1L of 0.2um polycarb filtered (with prefilters) water. Freeze. Take 3 reps per lake.  **Dissolved 13C:** 1L of 0.2um polycarb filtered (with prefilters) water in glass amber bottles. Fridge. Take three reps per lake.  **Seston 15N/13C:** screened water filtered on 0.7GFF.  **BP 15N/13C:** 1.2 prefiltered water filtered on 0.7GFF. | **Pigments:** use GFF prefilter from dissolved nutrients. Freeze.  **Seston Chla:** screened water through 0.7GFF. Freeze.  **BP Chla:** 1.2 filtered water through 0.7GFF. Freeze.  **BP DNA:** 100mls 1.2 prefiltered water through a 0.2um polycarb. Filter frozen.  **BP abundance:** 4mls screened water in cryovials with formaldehyde.  **Algal abundance:** 125ml screened water in lugols | **N uptake:** spike screened water in light and dark whirl packs with 15N. Incubate in lake for 24h. Filter for seston (0.7GFF) and BP (1.2-0.7um). Save filters. 3 reps per light/dark per lake.  **Nitrification:** save water from uptake bags. Freeze for 15NO3 analysis. Spike before freezing.  **N fixation?**  **Denitrification?**  **BP production:** 3H-leucine assay. 3 reps + killed sample  **BP respiration:** CTC uptake assay. 3 reps. |
| **Metalimnion**  222=3.25  221=3.25 | **TAg:** 30mls screened water in 4% nitric acid  **DAg:** 10mls water filtered with 0.2um polycarb filter in 4% nitric acid | **Dissolved nutrients:** 0.2um polycarb filtered (with 0.7GFF prefilter) water saved for DOC, TDN, NH4, NO3, NO2, TDP, TP |  |  |  |
| **Littoral**  **3 transects** | **Periphyton:** Scrape known area of rocks. Save slurry and filter with 0.8 polycarb. Save in 4% nitric acid. **How many samples? Spatial variation?**  **Macrophytes:** dried tissue saved in 4% nitric acid. **Separate epiphytic community, green tissue, roots? What about different species? Spatial variation?**  **Macroinvertebrates:** dried tissues saved in 4% nitric acid. **Different species? Trophic levels and/or FFG?**  **Fish:** Pike and perch Ag accumulation in various tissues (Jon)  **Terrestrial plants: sample submerged roots?** | **Periphyton CNP:** scrape known area of rocks. Save slurry. Filter on 0.7GFF.  **Macrophytes:** dried tissue saved for CNP. **Separate epiphytic community, green tissue, roots? What about different species? Spatial variation?**  **Macroinvertebrates:** save dried biomass for CNP  **Fish:** body CNP from perch used for excretion studies. **Other fish?** | **Periphyton 15N/13C:** scrape known area of rocks. Save slurry. Filter on 0.7GFF.  **Macrophyte 15N/13C:** dried tissue saved for isotopes. **Separate epiphytic community, green tissue, roots? What about different species? Spatial variation?**  **Macroinvertebrates:** save dried biomass for 15N/13C  **Fish:** body 15N/13C from perch used for excretion studies. | **Periphyton Chla:** scrape known area of rocks, filter on 0.7GFF.  **Macroinvertebrate density:** sample macroinvertebrates in a known area (or standardized unit effort). Count taxa and/or FFG. **Do we want biomass (length/weight regressions), or richness.**  **Fungal biomass:** ergosterol samples from maple leaves, macrophytes, LWD. **Do we want “natural” samples?**  **Fish populations:** Mike Rennie’s work? **Need biomass**  **Quantification of Littoral zone: %macrophytes, periphyton, OM. We need some way to quantify these compartments.** | **OM decomposition:** sugar maple leaves, macrophyte, and wood decomposition rates.  **Fish excretion:** measured perch CNP excretion rates in whirl packs.  **Macroinvertebrate excretion:** measure CNP excretion by macroinvertebrates. **Different species? FFG?**  **Fish respiration:** Mike Rennie’s model?  **Macroinvertebrate respiration:** measure O2 demand by macroinvertebrates. **Different species? FFG?**  **Fungal respiration:** measure O2 demand by leaf disks (final SM collection only)  **Fungal N uptake:** measure N uptake by leaf disks (final SM collection only). |
| **Sediments**  *(We need to consider spatial variation here)* | **Settled Sediment Ag:** Take sediment cores. Save in 4% nitric acid. **Different depths?**  **Sediment macroinvertebrates Ag:** dried tissues saved in 4% nitric acid.  **Sediment Ag\*:** sediments from traps filtered on 0.8 polycarb and saved in 4% nitric acid. | **Settled Sediments:** Take sediment cores. Filter for CNP. **Different depths?**  **Sediment macroinvertebrates:** save dried biomass for CNP |  | **Settled Sediment Chla:** sample top layer of sediment cores for Chla.  **Sediment macroinvertebrate density:** numerate inverts from sediment cores. | **Sedimentation\*:** sediment traps collected monthly  **N uptake:** measure uptake by sediments. **Use 15N?**  **Nitrification?**  **Denitrification?**  **O2 demand?** |