CARGO 5 CRUISE OUTLINE
Schedule of activities
Times in **bold** are critical

Travel day, July 29

Two vans from Twin Cities. Northbound drivers/riders are Sandy Brovold and Bridget Seegers. Sterner flying directly into Duluth (flight 5828 from Mpls arr 10:35 PM) and will take cab to boat dock. Drivers and riders back to Cities are Brovold, Seegers, Sterner.

Day One: July 30

All hands: Science meeting on board at 6AM.

0700 Depart for CD-1

1100 CD-1 Activities

1. CTD profile
2. Bio-optical profiling (1 hr)
3. Water sampling for core chemistry and biology -- Eight depths with Niskin rosette. Niskin water for Guildford/Hecky and for Kruger/Minor.
4. Collect water for grazing incubations (Niskins)
5. Collect water for three photosynthetron PI runs (3 depths, Niskins)
6. Six net tows, two at each of three depth intervals
7. Bio-optical profiling (1 hr)

1800 Latest possible departure time for WM

Cruise time minimum 7.5 h

Day Two: July 31

Begin deck work at WM at 0130

1. CTD profile
2. Collect water for bottle array, in situ grazing
3. Bio-optical profiling (1 hr)
4. Prepare in situ incubation bottles
5. Deploy bottle array **by 0500 (sunrise at 0535)**
6. Collect water for core chemistry and biology
   Eight in situ incubation depths.
   Water for Guildford/Hecky and Kruger/Minor
7. Six net tows, two at each of three depth intervals

1600, Site WM – Bio-optical profiling and Niskin samping.

2000, Site WM – Bio-optical profiling and Niskin sampling

2130, Day Two, retrieve bottle array **(sunset at 2040)**

Depart WM for CD-1. Minimum cruise time 7.5 h (allow some weather buffer)

While underway, process bottle array incubations, perform other opportunistic sampling.

Day Three: Aug 1

0500 Arrive CD-1

1. CTD profile
2. Bio-optical profiling
3. Collect water for St. Paul grazing incubations
4. Net tows

Cruise time 4 hr

Time for additional sampling while inbound.

Home no later than 1700, Day 3, or sooner if weather allows

Sterner Science Crew Primary Duties

Robert Sterner – Rad van bottle array and PI curves
Sandy Brovold – Process chemistry samples, assist in rad van as needed
Bridget Seegers – Grazing studies

Addendum: Information from Guldford/Hecky

Objectives: Characterize the vertical and diel structure of phytoplankton photosynthesis at two stations using fluorometric instrumentation.

Deck Activities:

1. Bio-optical profiling (two profiles to ~ 35 m): Fast repetition rate fluorometer (FRRF) and spectral fluorometer (Fluoroprobe). Two FRRF profiles are required

each time (actinic irradiance profile dark chamber profile). Estimated time 45 minutes – slow profiling required due to fluorescence protocol.

2. Niskin sampling (3 L at 3 depths)
    a. 2 L for particulate absorption spectra (GFF filter)
    b. 0.5 L for spectral pulse amplitude modulated fluorescence (PhytoPAM).
    c. 0.5 L for background fluorescence (GFF **and** polycarb 0.2 μm)

Lab Activities:

1. Dark adapt ~0.5 L for 1 hour for PhytoPAM analysis and FRRF dark adaptation measurement.
2. Filtration for particulate absorption spectra and background fluorescence (30 min).
3. Measure background fluorescence and PhytoPAM analysis (Stephanie to advise).
4. Download profiling data (15 min).