

MSE Science and Engineering Planning Meeting

Thursday, October 27, 2005 **Notes**

Present: Jim Barry, Francisco Chavez, Kent Headley, Kevin Gomes, Andy Hamilton, Charley Paull, Bill Ussler, Keith Raybould, John Ryan, Tom O'Reilly, Mark Chaffey.

Action items:

1. Schedule follow-on meeting to cover SSDS data requirements and SIAM data "snapshot" requirements (Chaffey).
 2. Review benthic camera preliminary requirements doc. (Barry).
 3. Schedule meeting with Tiburon pilots and Larry to review operational plan (Chaffey).
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1. Update on results from latest Shepard Meander cruise (Charlie).
 - a. Data - and implications for MSE experiment. *Visit to MSE site showed evidence of material deposition on BIN frame and Benthic cable. Water current and turbidity instrumentation recorded what could be several small events. Not clear if material is from lateral transport or vertical settling. Fairly strong up-canyon current at the time of dive (10-20 cm/sec.?). Need to make sure transport is measured all the way to the seafloor. Need to continue to embrace surface productivity/vertical transport aspects of the experiment (Francisco). Should try and get CTD cast to calibrate in-situ instruments if possible (Francisco), although winch limitations may preclude this (Ussler). Strong endorsement of experiment going forward from Charley and Jim.*
 - b. Operations tests of McLane hook-up results. *(Charlie) ROV weight made it difficult to maneuver near the profiler. ROV carried down replacement BIN and then was too light for delicate maneuvering - even after ballasting down. MSE operational plan needs to strive to have ROV manipulation operations be a weight-neutral as possible. One idea (from Charley) is to have room in elevator for two BINS so they can be swapped without putting one in the mud or needing another bottom stand. McLane drop location was planned to be 80 meters from the BIN but landed 150-170 meters away. Need to take this landing (in)accuracy into account in the operational planning. Other comments:*
 - a. *Don't want to have to change toolsled at sea if at all possible (this has come up before).*
 - b. *Should have homer pro on base of McLane – hard to find.*
 - c. *All hardware should be painted bright colors!*
 - d. *McLane cable should be bright color – not black.*
 - e. *Will need homer pro on end of McLane cable during servicing to help find it again. When servicing McLane, pull cable back toward BIN?*
 - f. *Releasing McLane without requiring ROV disconnect could save a dive.*

2. MSE instrumentation (Mark C.).

a) Instrument order status.

Surface instruments on order and/or received:

Current Meter, ADCP, RDI Long Ranger, 600m range (1 of 1)

CTD (SBE 37SM) (1 of 2)

Radiometer, Long-wave, ASIMET (1 of 1)

Radiometer, Short-wave, ASIMET (1 of 1)

Relative Humidity - Air Temp., ASIMET (1 of 1)

Pressure, Barometric, ASIMET (1 of 1)

Wind Speed/ Direction, ASIMET (1 of 1)

PCO2 (1 of 1)

Fluorometer/Backscatter, Wetlabs ECO BB2F triplett (9 of 9)

Surface instruments not yet on order:

Acoustic Release, Benthos (2 of 2)
CTD (SBE 37SM) (2 of 2)
Nitrate Analyzer, ISUS
Radiometer, Satlantic 350-800nm, Hyperspectral Es (air)
Wind Speed/ Direction, ASIMET (spare)
Radiometer, Satlantic 350-800nm Hyperspectral Ed-W (water, downwelling)
Radiometer, Satlantic 350-800nm Hyperspectral Lu-W (8 degree. 1/2 angle, water, upwelling)
Radiometer, Satlantic, anti-fouling shutter only

Benthic instruments on order and/or received:

Current Meter, ADCP, RDI Sentinel 600 kHz, 47 meter range (1 unit)
CTD (SBE 16+) (2 existing units)
Fluorometer/Backscatter, Wetlabs ECO BB2F triplett
Oxygen, Aanderaa (2 units)
Turbidity, Nephelometer, C-Star, 6000m (2 existing units)
Turbidity, Seapoint OBS, 6000m (3 existing units)
Current Meter, profiling, Aquadopp HR Profiler, 6000m (2 existing units)

Benthic instruments not yet on order:

Camera, Digital Still w/strobe (2 units and spare)
CTD (SBE 16+) (1 spare)
Oxygen, Aanderaa (1 spare)
Turbidity, Nephelometer, C-Star, 6000m (1 spare)
Current Meter, profiling, Aquadopp HR Profiler, 6000m (spare)

b. System failure data back-up strategies. *Plan has always been to have each instrument have internal batteries and memory and self-log in the event of system failure. Now that we are in the detailed implementation phase this has a few problems, for example the O2 sensor has no internal memory or batteries. It could be wired through the CTD but that would preclude being able to change sample rates or otherwise modify the experiment from shore. Another example is the Aquadopp current meter. It has internal batteries and memory but can only run for about five days maximum at the experiment data collection rate. The overall system repair strategies are to either replace a cable segment or BIN with a spare in case of non-catastrophic failure. If the failure is catastrophic then BIN replacement would be with a battery operated, low sample rate version to maintain data continuity. Ideally the local back-up would provide enough logging time to allow mobilization and restoration of the system using one of the above two methods. This would be a least a week or two given the difficulties of ship scheduling.*

Critical data source instruments for the BINS are:

Current Meter, ADCP, RDI Sentinel 600 kHz, 47 meter range
CTD (SBE 16+)
Fluorometer/Backscatter, Wetlabs ECO BB2F triplett
Current Meter, profiling, Aquadopp HR Profiler, 6000m

c. Criteria for evaluating radiometer obstruction. *Not discussed in detail. No objective criteria set except a desire to have the field of view as clear as possible. Suggestion to move the instrument mount slightly higher vertically. Possible reflecting surfaces in the field-of-view should be painted flay grey.*

d. Anemometer interference from wind generator.

Data from MTM2 wind readings suggests that for that deployment there was interference from the wind generator that caused an under reading bias in the MTM2 wind velocity sensor, especially at higher wind velocities (see fig 1). For MTM4 the wind sensor has been mounted higher (see fig 2) and we will attempt to quantify the height difference needed to eliminate interference from the wind generator in on-shore tests.

e. BIN instrument arrangement - preliminary design. *For current design draft , see fig. 3.*

i. Aquadopp orientation. *Aquadopp has "in-line" transducer arrangement. Need to select mounting angle that will give clear view without beam aliasing. Jim B. or alternate needs to look carefully at instrument performance and advise Johnny F. on optimum instrument mounting arrangement.*

f. Still camera status & requirements. *Insite digital still camera (Nikon coolpix based) does not allow downloading images over a 232 or 485 serial link, only USB, which the MMC does not currently support. High quality scientific cameras are available with extensive internal image processing, strobe control and ethernet outputs. Mark C. investigating. Option would be to have Insite integrate into housing and possibly re-use 1 Tiburon Panasonic video camera housing to save money (and help cover costs of more \$ scientific camera module). Mark C. forwarded preliminary specification to Jim B. and needs response before proceeding further.*

3. SSDS MSE science data products. A first look at desired capabilities. (Kevin G.) *This topic was not covered and has been moved to the next meeting.*

4. MSE schedule update (Mark C.).
a. Overall project schedule. *Overall, the project is about a month and a half behind schedule for the March 20th 2006 deployment. Some of this can be pulled back in line by paralleling some manufacturing operations but other items are*

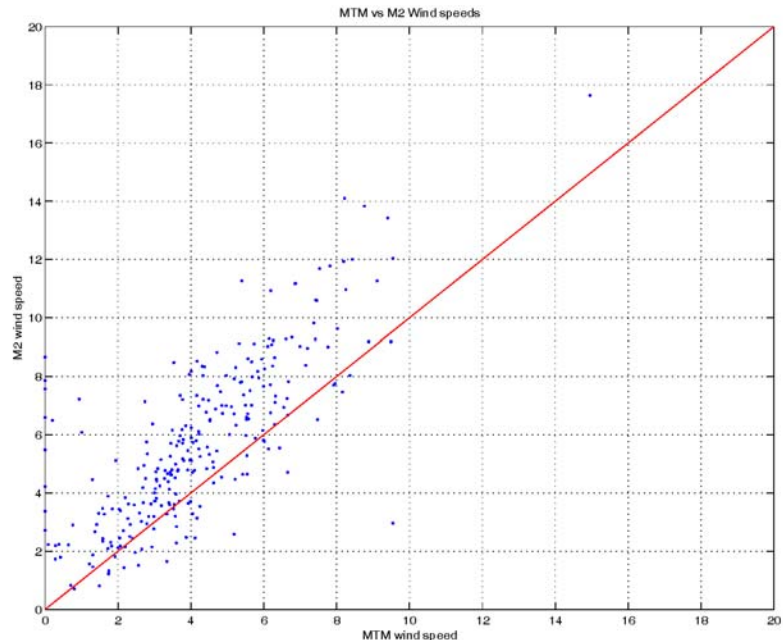


Figure 1. M2 vs. MTM2 wind velocity (Bahr).

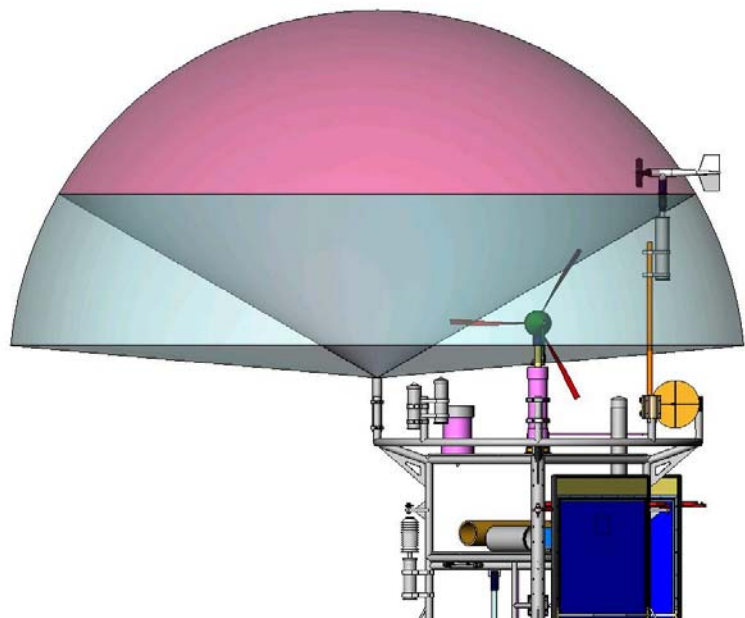


Figure 2. MTM4/MSE Draft Tower layout (Erickson).

right up against hard deadlines. One major pacing item is the riser cable. This needs to be ordered immediately to be received in time to complete the cable terminations and perform end-to-end testing with the entire system as a unit. Cable order is pending results from float bending test which are expected to be completed in a day or two. Manufacturers firm delivery lead time will be examined as well as the current schedule for rest of the project subsystems to make a final determination on schedule. Received strong advice from science party to explore contingency schedule with the Pt. Sur for possible deployment later in the spring and not push project schedule at the expense of overall system reliability.

b. Plan for moving forward on operations issues. Meeting being arranged with Tiburon group and Larry (and Charlie/Bill if possible) for mid-November to review operational plan at the PDR level.

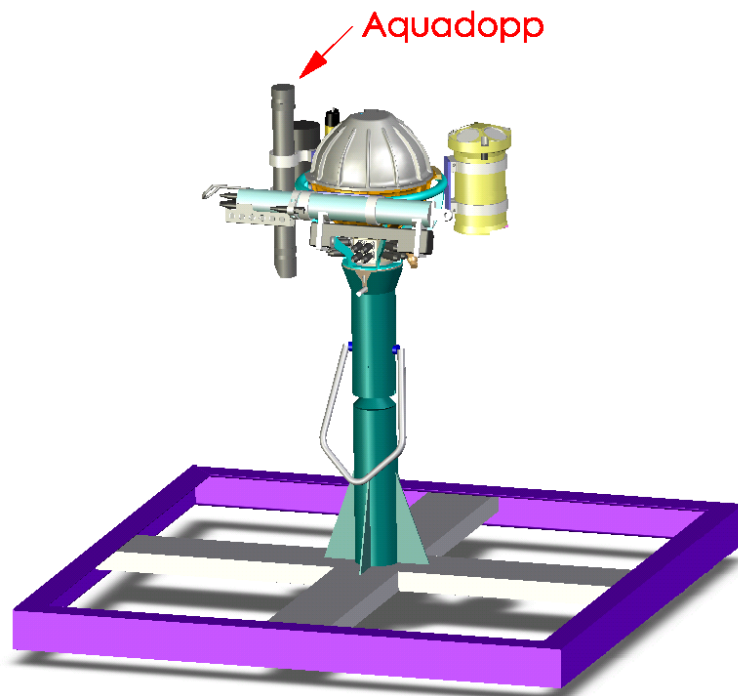


Figure 3. MTM4 BIN draft instrument arrangement (Ferreira).