

901805 - Coastal Biogeochemical Sensing

Week 52

1. Thom Maughan
 - a. UV-C test design sketch, parts ordering

Week 51

1. Scott Jensen
 - a. MFET/MCAP has been sent out for fabrication and assembly.
2. Brent Jones
 - a. Diagnosis pH sensor error during above deployment. Can not recreate the problem on the bench nor in the test tank. Ditched an anodized aluminum coupler and installed a PEEK coupler in case that was the problem.
 - b. Doing last minute purchases of cables.
 - c. Helped fill ~250 CO2 standards for use in 2021.
3. Thom Maughan
 - a. UV-C flashlight (duty cycle, period) for bio-fouling mitigation on sensors. Verify effect on sensors
 - b. Getting set back up for development after project shuffling. I've got a desk space limit.

Week 50

1. Scott Jensen
 - a. MFET/MCAP has been sent out for fabrication and assembly.
2. Brent Jones
 - a. Deployed, flew, recovered Spray 29 in support of Magdalena's vertical current estimator. Very intense flying close to the shelf that required some barnstorming maneuvers.
 - b. Diagnosis pH sensor error during above deployment
3. Thom Maughan
 - a. UV-C flashlight (duty cycle, period) for bio-fouling mitigation on sensors. Verify effect on sensors
 - b. Getting set back up for development after project shuffling. I've got a desk space limit.

Week 49

1. Brent Jones
 - a. Prepping Spray 29 for deployment later this week
2. Thom Maughan
 - a. CCSv10 compile and test on MFET for v3.3.1
 - b. Working v3.4 to add support for nphox and mphox boards
 - c. Discussed requirements for a point release v3.3.2

Week 48

1. Brent Jones
 - a. Continued Spray 34 hydraulic pump efficiency testing
 - b. Swapped out Spray 29 Optical + SBE63 Y cable
2. Thom Maughan
 - a. Working thru setting up a new laptop with code composer studio. Evaluating a move from CCS7 to CCS10. Worked thru a few hiccups.

- b. Working on MpHOx and NpHOx and feature list.

Week 47

1. Scott Jensen
 - a. Big order to start standard stock of MCAP and MFET is underway
2. Brent Jones
 - a. Begin tear down of Spray 34 hydraulic system. Performed hydraulic pump efficiency testing

Week 46

1. Brent Jones
 - a. Ordering parts for next year. Preparing to install new O2/Opt Y cable which requires a hotdog splice in the shop.
2. Thom Maughan
 - a. Installed CCS v10.1, evaluating a move from CCS v7... "Houston, there are problems" in that projects error on import. Working with CCS team
 - b. Fetched MpHOx hardware to prep for possible travel quarantine

Week 45

1. Scott Jensen
 - a. npHOx new FET bias configuration seems to work. Although, it does need op amps that can handle the higher common mode it imposes. The processor and ADC have been installed so that cod can begin to be developed for it.
 - b. Beginning work on a big order of MFETs.
2. Thom Maughan
 - a. Picked up an npHOx, new board, from Scott. Got setup for development at home. Evaluating move to CCS v10.

Week 44

1. Brent Jones
 - a. Recovered 2 sprays and doing post processing of data
2. Thom Maughan
 - a. Worked with Scott to diagnose two failed MFETs. Fixed one, the other is likely ESD damaged after deployment.
 - b. The laptop used (personal) for development is dead, setting up on an older machine for now. Newer ver

Week 43

1. Scott Jensen
 - a. npHOx checkout is continuing. A poor choice in amplifier is causing some consternation and in search of an alternative.
 - b. Failure analysis on a few MFET's are not turning up common problems.
2. Brent Jones
 - a. Flying sprays for pH comparison once CANON completed
3. Thom Maughan
 - a. npHOx board is in assembly and expecting to get one for preliminary board bringup. Planning to work 2 days next week on the project.

Week 42

1. Scott Jensen
 - a. npHOx board has arrived and is nearly assembled. Current tests look promising as board bring up continues
2. Brent Jones
 - a. Prepped, deployed, and am flying two sprays in support of CANON
3. Thom Maughan
 - a. nanoFET board is in assembly, scheduling board bringup for next week, possibly the following.

Week 41

1. Thom Maughan
 - a. The new nanoFET board was sent out for fab by Scott, expecting boards back mid-Oct., planning board bringup in latter weeks of Oct.

Week 40

1. Brent Jones
 - a. Bench testing additional logging functions for pH data. Diagnosing Fluorometer issue. Swapped in new pH sensor for Spray 34
2. Thom Maughan
 - a. Meeting with Yui and Joe to discuss software updates needed for MFET and MpHOx.

Week 39

1. Brent Jones
 - a. Recover two spray gliders and do post deployment calibrations. Collecting seawater to diagnose fluorometer issue

Week 38

1. Scott Jensen
 - a. Discussions around bringing the MFET/MCAP design to a stable release version and clearing various revisions.
2. Brent Jones
 - a. Flying spray gliders 29 and 34 24/7. There is some suspicion of fluorometer values being 2 blocked so Im tracing the measurement from the sensor, through the hardware, through the satellite, and ultimately to the final product
3. Thom Maughan
 - a. Meetings and discussions. Document procedure for board checkout with a focus on the analog simulator.

Week 37

1. Scott Jensen
 - a. Defined and of MFET/MCAP development with transition to distributable version

Week 36

1. Brent Jones
 - a. Prepped spray 34 for deployment. Diagnosing an issue with pH sensor when it is submerged. Flying Spray 29 24/7
2. Thom Maughan

- a. Went thru the reworked and broken MFET boards - delivered 6 partially tested boards to Joseph

Week 35

1. Scott Jensen
 - a. NanopHOx is ready to be sent out for fabrication.
2. Brent Jones
 - a. Running Spray 29 on line 67
 - b. Recovered Spray 34 and beginning turnaround for next week's deployment
3. Thom Maughan
 - a. MFET sleep issue on some boards resolved

Week 34

1. Scott Jensen
 - a. Put together history of MFET and MCAP
 - b. Finished layout of nanopHOx
2. Brent Jones
 - a. Continuing to run two spray gliders offshore. Doing comparative pH dives requiring lots of user intervention
 - b. Changing code to record higher res pH data to CF card
3. Thom Maughan
 - a. Board checkout on the MpHOx boards, so far so good. I should be able to offload this task as I've got a test procedure written.
 - b. Meeting with Yui and Joseph on MFET / MpHOx board status. Scott provided a hardware change list to help with the versions, very helpful. Discussed lessons learned and we are tightening our process for numbering and tracking the boards.
 - c. Working on support for MFET revA with MCAP revC to get MFETS for a deployment.
 - d. Went back thru some of the MFET boards that failed and found a jumper had been installed on the reworked boards that was preventing deep sleep. We should have boards to build instruments now.

Week 33

1. Scott Jensen
 - a. npHOx is slowly taking shape with a first layout going into review.
2. Brent Jones
 - a. Continuing to pilot 2 pH Spray gliders
3. Thom Maughan
 - a. Checkout and failure diag of MFET/MCAP
 - b. MpHOx board test procedure / testing of 38 boards. Will try to offload some of this testing to Joseph. Boards are testing well so far.
 - c. Meetings with Joseph and Yui. Yui outlined project needs for 2H2020

Week 32

1. Thom Maughan
 - a. Going thru the MFET/MCAP boards that have been reworked. Some are bad, some work fine except they don't sleep. Working to root cause the problem.

Week 31

1. Brent Jones

- a. Prepped and deployed Spray 29. Continued flying Sprays 29 and 34 in support of CANON and pH sensor objectives

Week 28

1. Scott Jensen
 - a. Sent out for a fabrication build of 38 MpHOxs.
2. Brent Jones
 - a. Continued prepping both Sprays for upcoming deployments. Deployed Spray 34. Currently flying pH mission for Yui

Week 26

1. Scott Jensen
 - a. MpHOx boards have been checked out and ready to go to large build.
 - b. MCAP suffered noise while operated near a Seabird 5P pump. Noise source was tracked to the pumps lack of common mode noise suppression capacitors. Addition of capacitor eliminates noise from MCAP. Some more diagnosis is needed to determine the noise vulnerability within the MCAP system
2. Thom Maughan
 - a. Primary focus has been on MPHOX to gate the assembly of 38 boards. MPHOX board bringup is complete (yeah!) and no issues found with pcb/layout or design. We had some issues arise during integration test that turned out to be a tiny component installed backwards - the little things can bite.
 - b. Scotts trip was delayed, so he took over the integration test and noise analysis for the pump-isfet interaction.
 - c. Reviewing bug and feature list.

Week 25

1. Brent Jones
 - a. Prepping Spray 34 for ballasting. Dealt with a wiring issue on the new pH install
2. Thom Maughan
 - a. Big push on board bringup for the MpHOx boards for go / no go on building 38 more boards.
 - b.

Week 24

1. Brent Jones
 - a. Prepping sn29 for deployment
2. Thom Maughan
 - a. Picked up two MpHOx boards. Worked Sat. and Sun on board bringup.
 - b. DAg board on hold, working on board bringup of MpHOx (Sat/Sun)

Week 23

1. Scott Jensen
 - a. Tested 5 reworked MFETs, all failed. Jose was able to salvage one. Others will need the same work.
2. Thom Maughan
 - a. DAg / pre-nanoFET dev. Ordered connectors
 - b. Discussion with Yui, proposals

Week 21

1. Brent Jones
 - a. Working on figures for paper

2. Thom Maughan
 - a. DAg design review slides.
 - b. Working on board bringup. Slow going due to small things like connector availability for serial and jtag.

Week 20

1. Brent Jones
 - a. Reviewing paper manuscript written by Yui. Going to need a few figures
2. Thom Maughan
 - a. Reviewing Yui's paper.
 - b. Small amount of progress on pre-nanoFET (DAg) firmware dev.

Week 19

1. Scott Jensen
 - a. Figured out a very low power design for Wake and Hibernate circuits of NanopHOx
2. Thom Maughan
 - a. Working to add support for processor variant and peripheral mix to the code base.

Week 18

1. Thom Maughan
 - a. In progress on pre-nanoFET software dev using a launchpad board and DAg
 - b. Re-structuring the source code for a processor variant.

Week 17

1. Scott Jensen
 - a. Found a very low power solutions for the hibernate feature on NpHOx
 - b. Started the layout of NpHOx

Week 16

1. Thom Maughan
 - a. Discussion on power consumption, npHOx desing

Week 15

1. Thom Maughan
 - a. Scott and Jose are starting up on the npHOx design, gave comments
 - b. Sent the Irauv DAg board schematic since it had a number of npHOx features implemented

Week 14

1. Thom Maughan
 - a. Email conversation with Yui about combining in some of the nanoFET features into DAg and doing a cost share. He is supporting that. Implemented isolated serial for the 8 channels and have the 24bit ADC along with some storage options (on board NAND and FRAM).

Week 13

1. Brent Jones
 - a. Recovered deployed Spray glider. Downloaded and processed onboard data
2. Thom Maughan

- a. Working on automated test hardware design. Have added a few features to the LRAUV data aggregator (DAg) to make it useful for MFET automated testing.

Week 12

1. Thom Maughan
 - a. Gave Scott the pin definitions for the nanoFET.

Week 11

1. Scott Jensen
 - a. Entered pin assignments for Nano pHox
2. Brent Jones
 - a. Completed integration of pH and dissolved O2 sensor on Spray 34. This required wiring and some fancy mechanical tricks to pack it all in.
 - b. Piloting Spray29 24/7. Completed line 67 out and back transect and am now flying in the vicinity of the Johnson float

Week 10

1. Thom Maughan
 - a. Configurable status protocol

Week 9

1. Scott Jensen
 - a. Overseeing fabrication of revision D of MFET/MCAP
2. Brent Jones
 - a. Standing 24/7 watch for deployed Spray
3. Thom Maughan
 - a. Talked to Brent, next Glider deployment is in April.
 - b. In progress on configurable status message protocol

Week 8

1. Thom Maughan
 - a. Bias battery voltage read routine has been added and tested.
 - b. Began implementing configurable status message protocol

Week 7

1. Brent Jones
 - a. Prepped and deployed Spray glider with pH sensor. Standing 24/7 watch as its deployed.
2. Thom Maughan
 - a. In progress adding bias battery measurement. It's coded, needs testing.
 - b. Working on DeepSeaDurafet, aka, nanoFET design. Looking deeper at software porting and pin muxing.

Week 6

1. Scott Jensen
 - a. Layout beginning for MphOx
2. Brent Jones
 - a. Beginning orders for parts needed to instal pH + DOX sensor on second NPS glider SN34

3. Thom Maughan

- a. DeepSeaDurafet, aka, nanoFET: Selected a processor and worked through the pin mux / signal assignment to help software compatibility by doing a proto design schematic.
- b. Reviewing ADC options for performance and long term silicon availability. There is an updated version of the ADS1248 that is mostly compatible.
- c. Handed off processor and pin assignments to Scott.
- d. Working on bias battery measurement

Week 5

1. Scott Jensen

- a. Completed first draft of schematic for nano-pHOx