

Engineering Weekly Report 12/9/2021 - 12/16/2021

Executive Council Notes

- 902106 Niobicon AUV Dock Development - This project is in full swing this week with tests offshore and final assembly of the dock mooring in the high bay. LRAUV Tethys has been docking to a test mooring while Brian and Ben refine the acoustic homing and dock latching software. Francois, James, Johnny, Aaron, Paul and of course Jose, have been assembling and wiring up the dock mooring as we get ready for full system testing beginning next week.
- 901911 ROVVR - A new paper was published last week in the proceedings of ACM's Symposium of Virtual Reality Software and Technology, and won the conference's award for best paper, this was a collaboration with UCSC and Olin College: <https://doi.org/10.1145/3489849.3489861>
 - Elor, A., Thang, T., Hughes, B. P., Crosby, A., Phung, A., Gonzalez, E., ... Takayama, L. (2021). Catching Jellies in Immersive Virtual Reality: A Comparative Teleoperation Study of ROVs in Underwater Capture Tasks. *Proceedings of the 27th ACM Symposium on Virtual Reality Software and Technology*. <https://doi.org/10.1145/3489849.3489861>



Individual Activities

- Kevin Barnard
 - 800139 - EyeRIS
 - Investigated Postgraphile for automatic Postgres schema -> GraphQL API generation
 - Started designing DB schema to help centralize LCM log data from deployments
 - 902005 - VARS Annotation Assistance
 - Performing cost/performance analysis of transfer learning on different YOLOv5 model variants via AWS SageMaker
 - Fleshing out some MOT editing features in BoxJelly
- Francois Cazenave
 - 901405 - Wave-Energy Conversion for Oceanographic Applications
 - Working on EM tether.
 - 902106 - Niobicon-Based AUV Docking Development
 - Finished assembling buoy
 - Preparing for test in the tank
- Mark Chaffey
- Danelle Cline
 - Out of Office

- Vacation 11/23-11/26
- Duane Edgington
 - 902005 - VARS Annotation Assistance
 - Working with Danelle and Kevin B. on year-end tasks
 - Overhead
 - WFH Internet outage Dec 14. Storm related?
 - Out of Office
 - Back from vacation, Dec 7. Post-international travel 14 day self-quarantine at home until Dec 21.
- Jon Erickson
- Ben Erwin
- Kevin Gomes
 - 300058 - DMO Support Western Flyer
 - Dataprobe bug fix seems to have fixed the GLL fix problem when rolling over GMT midnight.
 - 300070 - DMO Support Ventana
 - A small amount of support and meetings while the Greensea engineers are here upgrading the control computers for Ventana
 - Found the NAS for backing up GSS log files failed and have ordered a replacement. Not due until around Christmas, but drives look to still be intact (as far as we can tell).
 - 300079 - DMO Support Rachel Carson
 - Working on a bug fix for ArcMapNav that is consuming almost all my time. It uses very old framework (.NET 3.5) which needs ArcGIS <= 10.3 and the ArcObjects SDK <= 10.3 which I can't even find anymore. Very frustrating.
 - 901009 - CANON
 - Support for normal ODSS maintenance
 - Overhead
 - Flail with the notification of the Log4J bug which does impact us, but does not appear to have caused any problems yet. We are working with IS to try to go through all our systems to find where impacts and holes might be and it's painstaking.
 - End of year budget stuff
 - Did a broad re-factor of the hours for some of the engineers in my group to fold in changes that have taken place with project and staff leading up to 2022.
 - Tried to organize a group lunch, but the CA mask mandate put the brakes on that.
 - Lots of IS requests, DNS, statics IPs, CentOS 8 retirements, etc. etc.
- Andy Hamilton
- Kent Headley
 - 600034 - Precision Control Technologies for ROVs and AUVs
 - Working on code review for cppcheck updates to core code w/ Rich, Rob and Rock, checking a couple of critical changes
 - Overhead
 - Completed 2022 Engr Labor spreadsheet update
 - Annual review prep
 - Other admin
 - Out of Office
 - Dec 24-Jan 1 (vacation-ish)
 - Jan 11 (jury duty, tentative)
- Rich Henthorn
 - 600034 - Precision Control Technologies for ROVs and AUVs
 - CoNav development and test
 - Review CoNav design and implementation

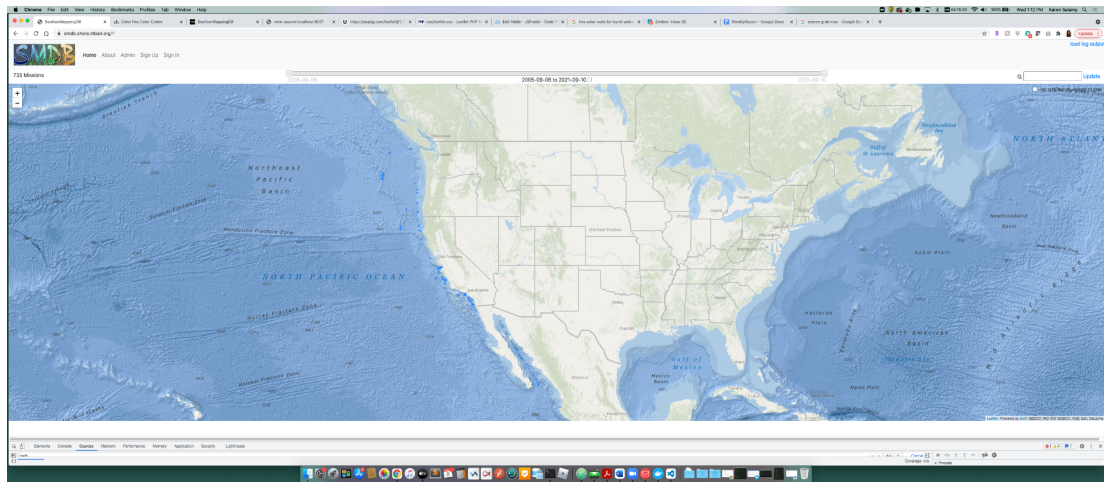
- TRN pull-request reviews
- 901405 - Wave-Energy Conversion for Oceanographic Applications
 - Reviewing tasks for updates post-deployment
- 901618 - Pelagic-Benthic Coupling
 - Weekly meeting
 - Transferred Sta.M data onto new hard drives
 - Testing reassembled Rover components
- 902101 - LRAUV Technology Development and Fleet Operations
 - Pilot training
 - CoNav development and test
- Out of Office
 - Dec 17 - 31, Holidays and vacation. Happy New Year!
- Brett Hobson
- Scott Jensen
 - 901805 - Coastal Biogeochemical Sensing
 - Continued work to track down temperature coefficients
 - 902101 - LRAUV Technology Development and Fleet Operations
 - Beginning of HE Thruster programming and checkout process
 - 902106 - Niobicon-Based AUV Docking Development
 - Configuring charger controller and working out a few analog signal mismatches.
 - Out of Office
 - Vacation
- Brent Jones
- Chad Keczy
- Brian Kieft
 - 708168 - DHS Y8
 - Met with team yesterday to discuss plans for HAB recon as well as next steps after LBL testing.
 - 800139 - EyeRIS
 - Not to be confused with "Eyeris", wrote an "Ayreris" mission for testing the transfer of real images via the acoustic link to the waveglider. Will test today if we can get out before the weather.
 - Lab tested image transfer to Hotspot via acommms
 - Merged DAT changes following some bug fixes
 - 902009 - AUV UI
 - SOW has been approved! Working on final signatures with our primary.
 - Met with team to discuss updates surrounding vehicle state and data page
 - Initial feedback interviews happening today/tomorrow
 - 902101 - LRAUV Technology Development and Fleet Operations
 - Troubleshooting of DAT compasses in two units. Decided to have physical board repositioned. Currently in EE tech lab but will do final validation once they're done.
 - Fixed a command mode issue in DAT
 - 902106 - Niobicon AUV dock dev
 - Added hardware timestamp ingest and setting for the DAT/USBL for more accurate 2 Hz updates on final approach
 - Changed DAT component to be asynchronous at 2.5 Hz.
 - Out of Office
 - 12/22-29 (PST)
- Denis Klimov
- Diana LaScala-Gruenewald
 - 200103 - Core CTD Data - MDUC

- Kevin Barnard training on ROV CTD QC O2 flags
- 901915 - Improving MBARI Data Impact
 - Been bad about filling this out lately, apologies
 - Continuing to work primarily on Improving Impact
 - Still working to get STOQS data loaded into dockerized TimescaleDB. Everything is set except there's a bug around getting my load script to run automatically at container startup.
- Overhead
 - Weekly meeting(s)
- Eric Martin
 - 708164.50 - Y2 Research Labor funds
 - Working on radar to hdf5 for matlab and python imports and data archival.
 - 901206 - Coastal Profiling Float
 - Troubleshooting pump configuration issues, we have been able to reproduce the failure seen at sea.
 - 901405 - Wave-Energy Conversion for Oceanographic Applications
 - Extensive fault analysis has nearly been completed on the failures seen in the EM tether.
 - Reworking the controller board
 - Specifying some upgrades to the controller system.
 - 901911 - ROVVR
 - New paper was published this week, a total of two for the year, and this one won best paper at the conference. See EC notes above.
 - 902100 - Telepresence on MBARI Research Vessels
 - Buying spare equipment
 - Mocking up UI rev 2
 - End of year summary
- Thom Maughan
 - 901805 - Coastal Biogeochemical Sensing
 - Demonstrated the OCR-504 driver to Yui and Jacki. Next step is to get HyperOCR up and running.
 - 902004 - Planktivore
 - DC/DC current limit testing. Polulu D36V50Fx is a great product.
 - Strobe, Strobe_Energy, and Strobe_Driver boards were sent out for fab on Thurs night. Worked thru tight spacing and 40amp/20usec for connectors.
 - In progress on the design and layout of the Camera Controller board. Designing around supply chain shortages is challenging - chips and connectors.
 - Parts inventory
 - Out of Office
 - Vacation is TBD, sometime end of Dec. Staycation.
- Mike McCann
 - 901101 - Seafloor Mapping
 - Fixed Notes.txt file lookup logic and reloading database following Jenny's fixes
 - 901221 - Midwater Time Series
 - Beginning to load i2MAP CTD data into a STOQS database
 - Overhead
 - Participated in LRAUV operator training session
 - Helping with log4j upgrades on various servers
 - Tested and merged the [gltf-generator code](#) that the CSUMB capstone students contributed and will be watching their presentation on Friday
- Rob McEwen
 - 600034 - Precision Control Technologies for ROVs and AUVs

- TRN pull request reviews
 - Working through Octree code
 - Working through Rock's CN code
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
 - Working on Believer 3 build
- 902101 - LRAUV Technology Development and Fleet Operations
 - Triton power analysis
- Out of Office
 - Dec 22-31
- Paul McGill
 - 300070 - DMO Support Ventana
 - Tested ground-fault channel isolator board with Jose. Made some changes to DTEC board and now they seem to work together.
 - 701127 - MARS O&M III
 - Helped MARS team to understand their ground-fault circuit.
 - 701145 - Penguin Hotspots
 - Integrated AOS board into system schematic
 - Got Brent's AOS code and was able to compile it and program AOS boards.
 - 901618 - Pelagic-Benthic Coupling
 - Alana and I replaced Li batteries in Rover.
 - Finished repairs to stbd propulsion motor controller.
 - Troubleshoot Rover MF modem. It's dead and replacement is on order.
 - 901700 - Acoustical Ocean Ecology
 - Finished analysis of Deimos cable failure, which appears to be failure of ODI connector.
 - 901904 - Deep-Sea Coral-Sponge Community Observatory
 - Ordered dummy plugs for Deep Sea Connect antenna connectors.
 - Out of Office
 - I've been taking a vacation day on Fridays
- Ed Mellinger
- Tom O'Reilly
- Craig Okuda
 - 901007 - Benthic Biology and Ecology
 - Post dive analysis
 - Out of Office
 - Vacation days
 - Overhead
 - Cupola clean up
 - Lab clean up
- Doug Pargett
 - Out of Office
 - Sick Leave
- Ben Raanan
 - Out of Office
 - June 8-22
- Mike Risi
 - Out of Office
 - April 26-30: Ocean Imaging Cruise
 - May 3-7: Vacation
 - June 4-11: Vacation
 - June 28-July 2: Vacation

- August 30-September 14: Ocean Imaging Cruise
 - September 14-17: Vacation
 - November 22-24: Vacation
 - Vacation on alternate Fridays
 - Paul Roberts
 - Brent Roman
 - 901913 - Demonstrating high-speed communication with a submerged AUV
 - Sustained data transfer at 19KB/s between Waveglider and modem hung 2m below it in test tank
 - Demoed smooth 15fps 640x480 video from LRAUV below Waveglider in test tank
 - Next steps are to pot cable to mount modem permanently in LRAUV
 - Combined LRAUV<->Waveglider test deployment in January 2022.
 - Carlos Rueda
 - 708168 - DHS Y7
 - Latest Dash 4.8.6 installed by WHOI.
 - 902101 - LRAUV Technology Development and Fleet Operations
 - TethysDash backend: Since past Monday morning with updated log4j library to address the infamous Log4Shell critical vulnerability. (Also immediately installed by WHOI – thanks Ryan!) (BTW, considering <https://google.github.io/flogger/> as an alternative library in a future version.) The complete Dash system is now [4.8.6](#) with new features (auto-reload of last vehicle selection; advanced filtering modes), and font-size “fixes” in some frontend places to address very weird and unexpected display misbehavior in Windows/Chrome, reported by Yanwu.
 - TethysL: Mike Godin’s PR that allows the LRAUV application to also accept mission files with the .tx file extension, has been merged (thanks Ben!).
 - Overhead
 - Attended LRAUV Operator Training, all of this while closely monitoring the dash system: All ran smoothly with the 60+ concurrent sessions (from 50+ participants), with the backend services under < 8% CPU usage most of the time (well, at least while I was looking) 😊
 - | NAME | CID | CPU | MEM | NET RX/TX | IO R/W |
|------------|--------------|-----|--------------|----------------|-------------|
| ctop | f5d3fe758e68 | 1% | 6M / 3.68G | 0B / 0B | 4K / 0B |
| tdpostgres | 433351b0d98a | 3% | 75M / 3.68G | 6.97G / 66.7G | 1.66G / 68K |
| tethysdash | d29574c90bac | 6% | 759M / 3.68G | 14.1G / 56.52G | 179M / 64K |

 - Log4Shell meeting and additional verifications re no-vulnerability.
 - ESIP SemTech meeting.
 - Contacted by a representative from <https://www.claytip.com/>, which looks promising (I recently learned about Claytip at Scale by the Bay. We’ll talk next month.
 - Out of Office
 - Dec 9,10, 21–31: vacation
 - Dec 6: out sick.
- Karen Salamy
 - 901101 - Seafloor Mapping



- Out of Office
 - Vacation: December 22, 2021 - January 4, 2022. May extend this to spend some more vacation time with my daughter.
- Brian Schlinging
 - 500055 - Video Annotation DM
 - Disk space on `smb://titan.shore.mbari.org/M3` is getting tight. Brian created [a program](#) to ensure only 120TB are being used. The oldest files (by last accessed time) are migrated off each morning.
 - To manage the large volume of incoming videos from the tape conversion project, the video registrar now runs every morning but only processes up to 10TB of video. [A list of videos registered is email](#) to Brian each morning and are then migrated off of LTO to make space.
 - Brian has finished writing the [configuration and secrets management server](#). Fun endpoints:
 1. <http://nexus.shore.mbari.org:8400/config/endpoints> (If authenticated it will provide access secrets to each service)
 2. <http://nexus.shore.mbari.org:8400/config/health/status> (Provides health status of all M3 microservices, if the health status field for a server is missing, then the server is down)
 - Added health endpoints to all M3 microservices.
 - Integrating the config/secrets server into [vars-annotation](#).
 - Integrating the config/secrets server into the ships M3 docker-compose stacks and the shore deployments.
 - Fixed issues with proxy server configuration in the M3 docker-compose stacks on the ships
 - Overhead
 - Reviewed all deployed applications to ensure they are not vulnerable to [#log4shell](#) attack. As time allows, switching Java apps to use [System.Logger](#) (current recommended best practice) with [an slf4j backend](#)
 - Ran some docker kung-fu on a private internal docker registry that was using up disk space. For reference:
 1. `docker exec -it registry /bin/sh`
 2. Create a [config.yml](#) file
 3. `registry garbage-collect ./config.yml -m`
- Rich Schramm
- Alana Sherman
 - 300080 - DMO Support Mini ROV
 - More software training with Dale
 - Went on a failed Fulmar trip due to big swell
 - 901618 - Pelagic-Benthic Coupling
 - Replaced batteries for Rover

- Trying to troubleshoot a few things
- 901904 - Deep-Sea Coral-Sponge Community Observatory
 - Discovered the reason for macro camera failure, it was a message on the LCD waiting for a finger to push to turn off. Luckily we got two days of beautiful images and everything else worked. We will try to get the Canon EOS R6 integrated in January.
- Overhead
 - Hiring committee meetings for EE position and Seafloor Processes PI
 - Out early Monday for a dr appt
 - Lots of last minute work on the group resource allocations for 2022
- Out of Office
 - Dr appt Weds am
 - On vacation Dec 20-31 yay!!