

Engineering Weekly Report 4/21/2022 - 4/28/2022

Executive Council Notes

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Individual Activities

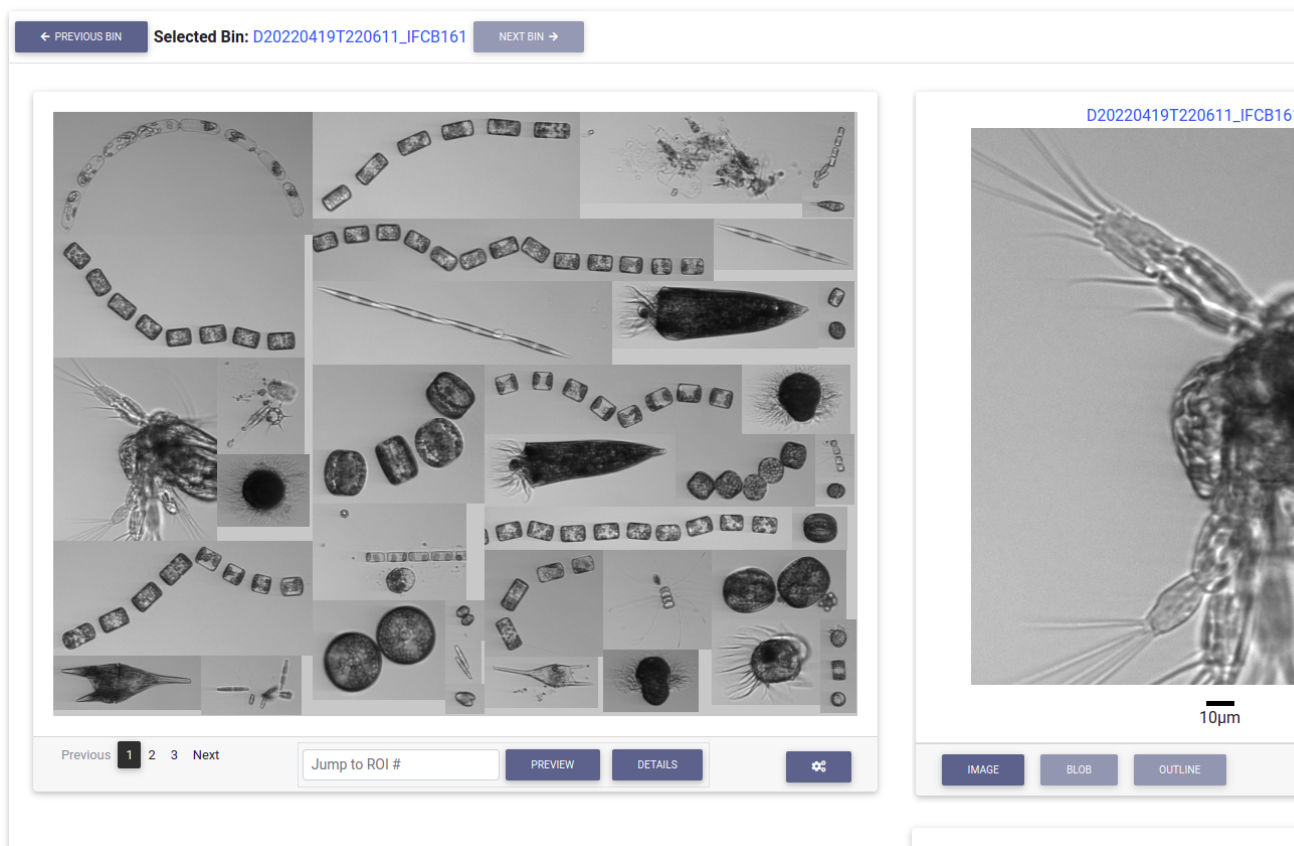
- Kevin Barnard
 - 500055 - VARS, M3/RS, DSG
 - Continued updating Annosaurus OpenAPI spec
 - Experimented with stoplight.io for generating & managing API docs
 - 701139 - ML Tracking
 - Hunted down some missing & overwritten LCM types; working to parse more LCM logs
 - 902002 - FathomNet
 - Wrote script for ML -> VARS merge
 - Ran IoU experiments against ML/VARS localizations
 - 902005 - VARS Annotation Assistance
 - Continued to polish BoxJelly + Cthulhu integration
- Francois Cazenave
 - 901405 - Wave-Energy Conversion for Oceanographic Applications
 - Monitoring wave energy buoy
 - Analyzing data from buoy
 - 902106 - Niobicon-Based AUV Docking Development
 - Meeting with NG attorneys about patent.
 - Working with Jerry on parts for new power transfer device
 - Planning recovery of mooring
 - Out of Office
 - One day of vacation
- Danelle Cline
 - 901502 - Soundscape Research and Education
 - S3 bucket sync management for logs access
 - Setup Amazon Athena database and working on queries to assess OpenData program data usage
 - Group meeting discussion on click train detection
 - 902005 - VARS Annotation Assistance
 - Tracking pipeline benchmarking and optimization with Duane. Current MOTA is ~53%. Need more fully annotated videos to measure accurately. BoxJelly is a potential tool for this.
 - Syslog setup on production server deepsea-ai to start logging dashboard and database API use.
 - Fix issues with postgres after sql server migration to M3_TRACKS database broke a few things. Improved handling of AWS security keys and S3 track data sync/loads.
 - Next steps are to return the batch processing, inserting the optimized tracking docker container into the elastic EC2 pool that I paused on to focus on database migration.

- Overhead
 - Attended AWS Summit Conference in San Francisco, Moscone Center. Met with non-profit representative, attended sessions on AWS RoboFlow to support Giancarlo, database and SageMaker sessions.
- Duane Edgington
- Jon Erickson
 - Still working with and advising Quest Institute. Mostly about their MARS experiment.
- Ben Erwin
 - Out of Office
 - Vacation 2/12-2/20
- Kevin Gomes
 - 300070 - DMO Support - Ventana
 - Starting to dig into code for GSS logging to be installed on new bubinga
 - Starting to dig into Xojo code for Dive app
 - 902012 - Telepresence on MBARI Research Vessels
 - More work on the telepresence web portal. Still ironing out the integrations with Zoom and Slack and authentication. Real head-banging stuff.
- Andy Hamilton
- Kent Headley
 - 901101 - Seafloor Mapping
 - Resolved several issues in rovtrn code; on track for cruise next week
 - 901618 - Pelagic-Benthic Coupling and the Carbon Cycle
 - Worked with Chris W, Alana A and Rich H to run a loop and cross test at Sta. M
 - The acoustic conditions were marginal, with ~20% range return rate
 - The waveglider control algorithm performed reasonably well in terms of automated error recovery, i.e. detecting and responding to lost ranges)
 - The mission didn't complete a full loop and cross cycle, but the error recovery patterns provided adequate spatial coverage to produce a location estimate
 - 902204 - Scalable Marine Robotics Foundations
 - Met with Gian Carlo to discuss progress and next steps
 - Overhead
 - SRSC committee meeting
 - DEI committee meeting
 - Carbon waveglider transfer
 - Code review
 - Misc admin
 - Out of Office
 - May 2 : Precision Control/Seafloor mapping Ventana TRN test cruise
- Rich Henthorn
 - 600034 - Precision Control Technologies for ROVs and AUVs
 - Resuming CoNav development
 - Wrapped up first cut at data logging
 - Began next phase: config file, refining, documentation
 - Combing through TRN syslog files to detect convergence
 - No network connection to BSC
 - 901618 - Pelagic-Benthic Coupling and the Carbon Cycle
 - Working through Rover communication issues
 - Out of Office
 - July 4 - 18, vacation & WFH, email, phone, zoom OK
 - Sep 21 - 30, Sta.M Cruise (final scheduled cruise of the Western Flyer)

- Brett Hobson
- Scott Jensen
 - 901205 - SURF Center
 - Preparing drawings for third terrestrial housing build
 - A little help with saildrone
 - Sampler fluidics prototype
 - 901405 - Wave-Energy Conversion for Oceanographic Applications
 - Beginning to check out recent system build
- Brent Jones
 - 901009 - CANON
 - Successfully deployed Wire Walker with pH sensor for the first time ever! Unfortunately, telemetry package has once again failed. It did return some data before dying. Entire week was spent prepping and deploying
- Chad Keczy
- Brian Kieft
 - 706007 - USGS Great Lakes Prey Fish Assessment
 - Working on logistics for August
 - 708168 - DHS/LRAUV Under-Ice
 - Wrote component interface for INS and multibeam
 - Made an animation of our “oil” spill
 - 708143 - Eco HAB
 - Prepping vehicles for May. Finished troubleshooting network/joystick issues on Brizo.
 - Met with Nick (UCSB) to talk about boat support and other logistics
 - 901513 - Targeted Sampling by Autonomous Underwater Vehicles
 - Working with Yanwu on patch mapping mission tests
 - 902101 - LRAUV Technology Development and Fleet Operations
 - Ran Tethys Thu-Tue on a mission testing some docking changes as well as patch mapping
 - Tested fixes to fast GPS fix mission
 - Out of Office
 - 05/15 - 06/04 (EcoHAB PDT)
 - 07/02 - 07/09 (HST - vacation)
 - 07/13 - 07/22 (AKDT)
 - 08/01 - 09/03 (EDT)
 - 09/12 - 09/28 (GMT+2 - vacation)
- Denis Klimov
- Diana LaScala-Gruenewald
- Eric Martin
 - 708167 - WEC Dynamics and Control
 - Initial radar tests good, Rob McEwen is processing, auto gain is clearly needed.
 - 901101 - Seafloor Mapping
 - Camera testing last week. Prepping for tank tests.
 - Moving the lab downstairs.
 - 901206 - Coastal Profiling Float Transition to Science Applications
 - CPF001 ready for final assembly and tank testing.
 - Light support for current deployment
 - 901405 - Wave-Energy Conversion for Oceanographic Applications
 - Closely monitoring the buoy for its first week out, so far so good.
 - 902012 - Telepresence on MBARI Research Vessels
 - Meeting last week to review Leila Takayama’s first workpackage. She has really engaged people and pulled out some very interesting insights.

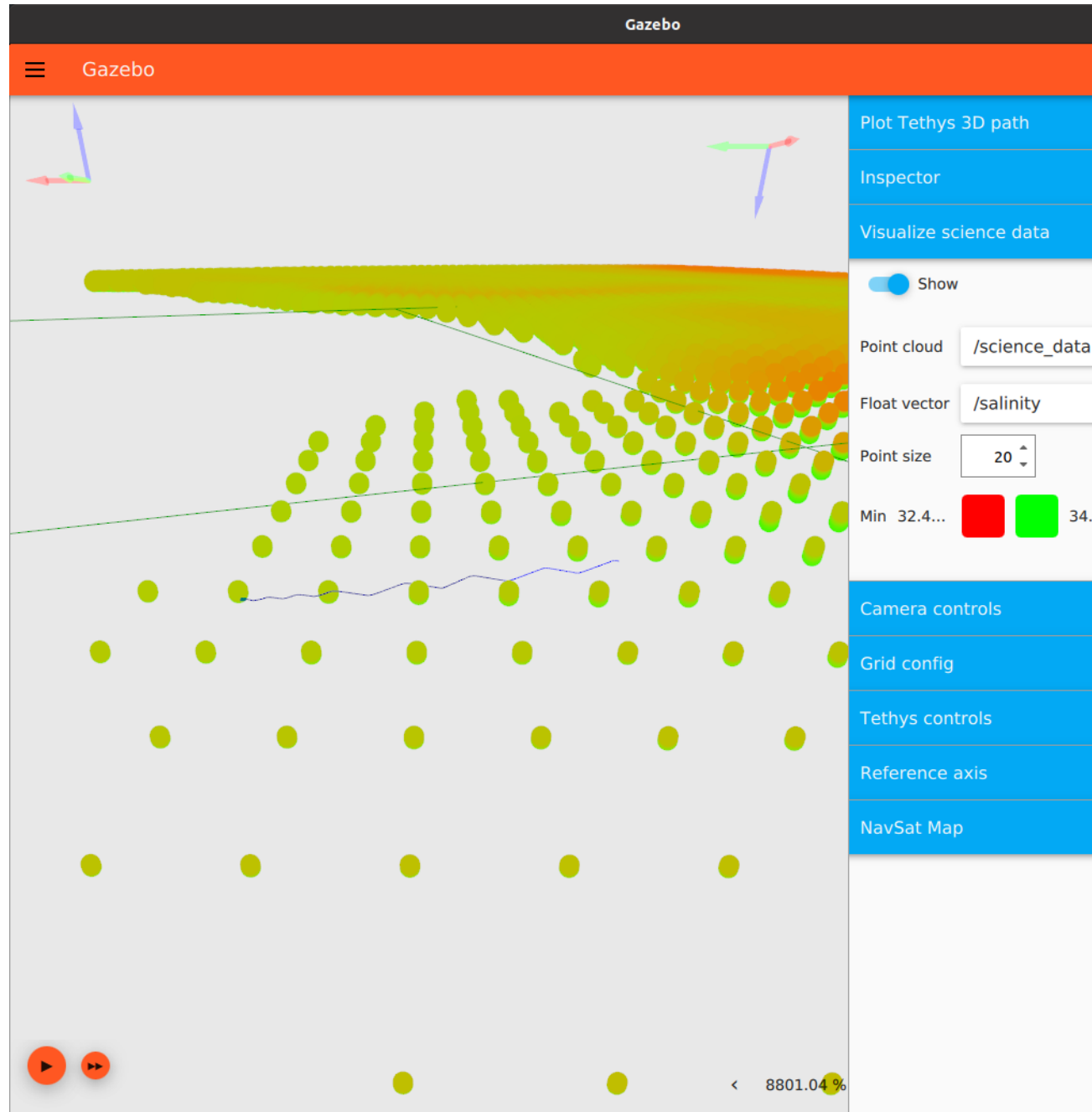
- Moving forward with surveys.
 - 902204 - Scalable Marine Robotics Foundations
 - Paragon ASV data collection concepts
 - Discussing some added project management tasks.
 - Overhead
 - Interview of Seafloor Processes candidate.
- Thom Maughan
 - 901009 - CANON
 - GPU laptop assist
 - Setup base NVidia image (x2) for Xavier NX in eDNA lunchbox.
 - 902004 - Planktivore
 - Working to be deployment ready on 5 May and in the water on Spray 10 May, drafted punch list
 - Worked with Paul R to finish camera control board bringup, invert trigger signal.
 - Base configuration of 3x Xavier NX + 2TB Samsung 970 with the latest Jetpack 4.61,
 - Benchtop 'soak' test of two cameras, camera controller and xavier nx over the weekend. No problems, but no ROI's either as the cameras are pointed at nothing.
 - Porting i2c driver for Keller PA7LD pressure sensor from whaleshark tag.
 - Worked with Denis to provide design requirements and test his acrylic lens extractor - works great! We are now enabled to move forward with cameras in housings.
 - Worked with Jon to get o-ring analysis on reduced (2.738) diameter acrylic.
 - Worked with Aaron on pressure test plan using the Noot housing filled with RO water with compensation. Test started 25 Apr, 10 cycles to 750 psi, with an hour hold time at 750 on one cycle. Passed test for 500m.
 - 2nd camera controller board is stuffed with low profile (expensive!) machine pin headers, in progress on benchtop integration test.
 - In progress on Xavier NX, camera control mounting in compute node. Wiring diagram, in progress on housing wiring with help from Denis.
 - Worked with Aaron on revised syntactic design to address buoyancy / trim challenges. So far so good with Aaron's water jet approach. Reviewed foam calcs with Paul and found I made an error but we can trim the length to compensate.
 - Out of Office
 - TBD trip to Montana.
 - May 27 - 31 Camping
 - Jul 6 - 19 Camping, Bear Lake Monster Swim
- Mike McCann
 - 200109 - Core Mooring Data - MDUC
 - Got Peter's help with remembering how to restart tomcat7 on elvis following addition of the current M1 mooring data to <https://dods.mbari.org/thredds/OSMooringCatalog.html>
 - 901101 - Seafloor Mapping
 - Met with Jenny & Karen to discuss next priorities
 - Overhead
 - Frustrated with front-end development – how do people even debug CSS & Bootstrap?!
 - Squashed a few edge case bugs with nightly emdb loading of newly edited ROV nav files
 - Will be meeting with Lonny & Krystle to go over using <https://emdb.shore.mbari.org/>
 - Trying to figure out how to add a map view to the CBV-driven dives detail view...
 - Out of Office
 - Vacation day: Thursday 28 April 2022
- Rob McEwen
 - Out of Office
 - Vacation April 29 and May 11-13.

- Paul McGill
 - Out of Office
 - Will be on vacation April 21st thru May 12th.
- Tom O'Reilly
 - 300082 - DMO Support - Wave Glider
 - Worked with Yui Takeshita, Ivan Masmitja, Brian Kieft and Chris Wahl to support acoustic target geolocation and tracking experiments on our Wave Glider Hotspot. Developed scripts and procedures, helped install third-party software on Hotspot to support these applications.
 - 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
 - Working with project team toward first over-ocean flight by the end of May. We are frequently testing our low-cost fixed-wing *Believer-2* drone at an inland site near Hollister, refining vehicle design and operational procedures. Through numerous trials we can now reliably launch the drone by hand-tossing it from a slight elevation (e.g. a pickup truck bed), fly automated camera surveys, then land the vehicle via parachute or "belly landing". We're developing a water-proofing process for the drone, such that it can land in the ocean with no damage to camera payload, flight computer, and other onboard electronics, verifying in MBARI's test tank. We're now assembling *Believer-3* and *Believer-4*, which will be waterproof and are intended to be our primary science vehicles for use over the ocean.
 - 702103.77 - **HABON/FC**
 - Worked with team in collaboration with CENCOOS and UCSC to integrate, test, and deploy the Imaging Flow Cytobot on the latest wave power buoy (708164). IFCB was first deployed on the power buoy last summer for a few months; this time we hope the instrument will collect images for 5-6 months before recovery. Images are acquired from a 5 ml sample every 24 minutes; the attached were acquired on April 19, the day after deployment, and shows chain diatoms, dinoflagellates, and a crustacean nauplius. If you want to view all the images collected so far (and who wouldn't???), visit the [IFCB data dashboard](#).



- Craig Okuda
- Doug Pargett

- 901205 - SURF Center
 - Rebuilding the MV1 ESP valve assembly to solve a combined leak and no-flow error.
 - Reassembling the MV3 ESP to prepare it for Saildrone deployment. Making a new bleach bottle holder and external valve assembly.
- Ben Raanan
 - 902102 - Multi-LRAUV Simulation Environment
 - Acceptance tests with science data in the loop



- Out of Office
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- Mike Risi
 - 600034 - Precision Control Technologies for ROVs and AUVs
 - Working with Rob M. on TRN simulations of Portuguese Ledge
 - 701147 - MARS O&M IV
 - Attended MARS PDR
 - 901101 - Seafloor Mapping

- Final preparation for ROV TRN testing on Monday
- 902204 - Scalable Marine Robotics Foundations
 - Working on FLIR camera driver
- Out of Office
 - May 5 - vacation
 - May 9-10 - vacation
 - June 2-8 - OI cruise
 - June 10-14 - vacation
 - June 20-22 - vacation
- Paul Roberts
 - Out of Office
 - 4/2 - 4/9 (spring break san diego)
- Brent Roman
 - 706005 - eDNA Grass Carp Sandusky
 - Investigated why sample volumes are low – seems just to be due to turbidity.
 - 708143 - ECOHAB - Andy Allen
 - Worked with Bill Ussler to have ESP produce an SPR results summary
 - 708146 - Saildrone
 - Visited to install ESP test “brain” and verify satcomms are working
 - Working with Doug and Scott to build a watertight ESP “brain” to ride along on next week sea trial
 - Worked with Saildrone to conform to their Ethernet connector standard
 - 708165 - NOAA-MERHAB
 - Ongoing support of NWFSC’s upcoming deployments
 - Fixed bug that arose due to firmware update that added Ah sensor
 - Old real.log file was confusing the dumplog utility
 - 901205 - SURF Center
 - 2 stepper motor connectors had ripped off Elf boards on ESPtower
 - disssabled , replaced damaged boards, updated all firmware
- Carlos Rueda
 - 901502 - Soundscape Research and Education
 - Explored detection of sperm whale clicks using the BLED technique (via Raven) and shared the exercise with the team. Promising results. Plan is to continue tuning the process.
 - 902005 - VARS Annotation Assistance
 - Set up BoxJelly+Cthulhu as a means to reproduce Cthulhu issues. Many thanks Kevin B. for the great assistance.
 - 902009 - AUV User Experience Design
 - More TethysDash backend adjustments toward removal of obsolete code and data entities (from legacy version), as part of general modernization efforts, and toward facilitating improved API documentation.
 - 902101 - LRAUV Technology Development and Fleet Operations
 - TethysL is now [2.3.5](#), already set up globally on tethyshub. Main change is a language enhancement related to macros (used in the updated/simplified [_examples/mbts_sci2.tl](#)).
 - Overhead
 - DEI AC meeting / review of materials.
 - As suggested by the ESP team, I will be added as “observer” to the Saildrone Mission Portal. At this point, I’m mainly interested in this because of the work I’ve been doing on TethysL, so, there’s probably some potential synergy to explore.
 - Out of Office
 - May 16-20: vacation

- Karen Salamy
 - 300057 - Mooring Maintenance
 - Spent more time than usual this week on Mooring work. Yesterday I prepared the test directory for the upcoming Mooring turn (scheduled for Jul 15, 2022) so Jared F. can begin testing the deployment set up. This is my first time preparing for a mooring turn without Rich so I have been extra careful with all steps in the process.
 - 901101 - Seafloor Mapping
 - I have been focusing quite a bit lately on updates and enhancements to the SMDB Dash. I met yesterday with both Jenny and Mike M. to discuss my current progress and to get information on focusing on issues that they both would like to see with SMDB Dash once completed. Overall it was a very helpful meeting for my design and inclusion purposes.
 - Overhead
 - Attended (via ZOOM) the candidate interview/presentation for the SeaFloor processes position.
 - Helped various users with their repo accounts and access this week.
- Brian Schlining
 - 500055 - VARS, M3/RS, DSG
 - Finalized support for postgresql to all M3 microservices. M3 services can now run on SQL Server, Apache Derby, Oracle, and PostgreSQL.
 - Finalized a migration path for existing VARS systems to copy a database to a new location and finalized testing ... [here](#), [here](#), and [here](#). The copy can work across different databases. (e.g. copy from SQL Server to PostgreSQL)
 - Updated the [m3-quickstart](#) project, which allows labs to easily run a VARS system, to use postgresql as the default database
 - Updated the [jsharktopoda](#) video player's code base to the latest version of JavaFX. JavaFX 18+ is supposed to support HEVC, but it didn't work in testing.
 - Lots of support fun related to this week's titan upgrade!!
 - Created [integration tests](#) to quickly pin-point any issues with MBARI's M3 services. All tests can be run using [http_runner.py](#). Created a parallel test set for DARC to test their services.
 - Discussions about codecs/color spaces for 4k video. Met with Sony representatives for updates on their hardware video encoders.
 - Ran transcoding tests for ProRes 4K to HEVC to see if it was a feasible solution in the case where we can't encode both streams on the ships. On an M1 mac (which has hardware encoder/decoders for both ProRes and HEVC), the transcode rate is about 0.77x, so a 5 minute 4K file would take 6 ½ minutes to transcode. On a system without hardware support, transcoding the same file takes about 3 ½ hours.
 - 902005 - VARS Annotation Assistance
 - Working on [Sharktopoda's](#) communication specifications to integrate [Cthulhu's](#) localization functions and remove dependencies on ZeroMQ. We'll use this spec to contract the development of an updated Sharktopoda video player that supports localizations on video. Once the spec is done, Brian will create [a test client and server](#) for testing new development. The video lab hopes to contract out development of the new video player ASAP.
 - Overhead
 - Migrated DARC's VARS system to a postgresql database
- Alana Sherman
 - Overhead
 - Mostly overhead this week: strategic roadmap, launching new EE hire, and Seafloor Processes interviews.