

WeeklyReport

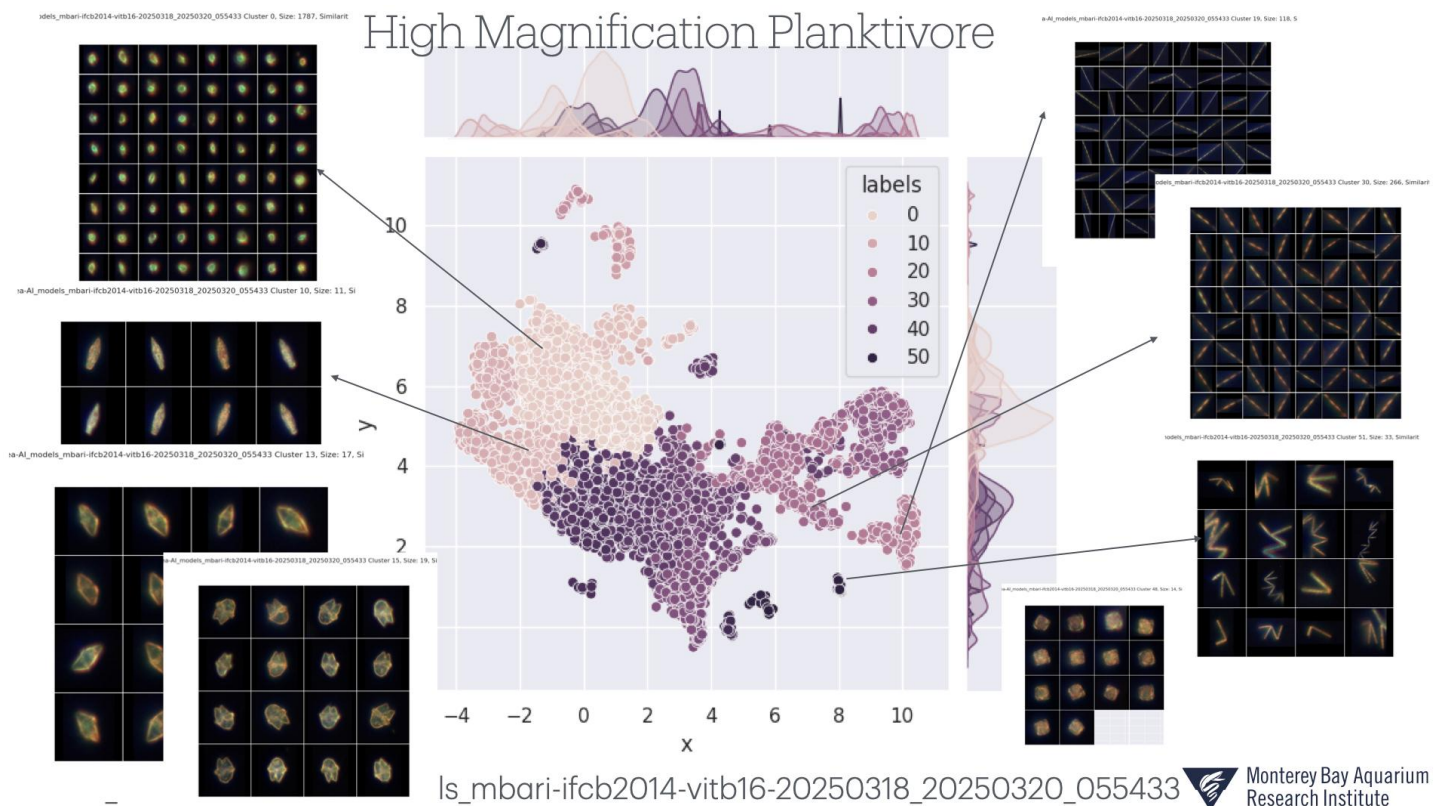
Engineering Weekly Report 3/27/2025 - 4/3/2025

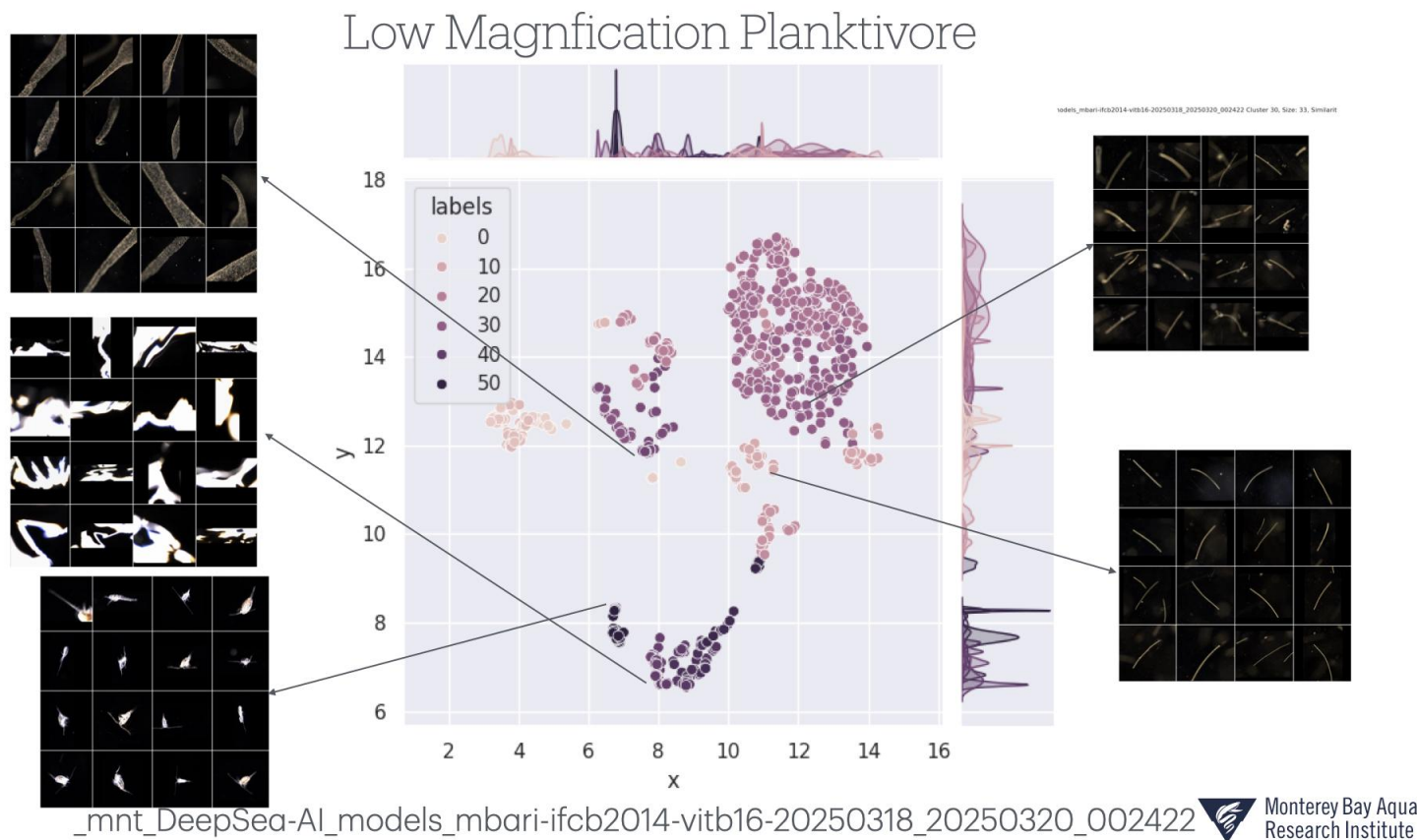
<https://docs.mbari.org/internal/projects/Engineering/Weeklies/2025/>

Executive Council Notes

- Data from the Planktivore high and low magnification cameras was successfully clustered in preparation for training a classification model using MBARI GPUs. The teams are now working on labeling the clusters using the easy to use web annotation tool on mantis.shore.mbari.org. Ciliates, Dinoflagellates, Prorocentrum, Akashiwo, Gyrodinium, Pseudo-nitzschia, Chaetoceros, Thalassionema, Copepods, and more were extracted into meaningful clusters to assist with creating labels to build an accurate classification model. The machine learning methods were similar to those used on other imaging systems, including a SONY camera on our Trinity drone, the ISIIS plankton imager, ROV and i2MAP imaging systems. Classification [balanced accuracy](#) ranges from .81 to .97 using these clusters which is very good! We have made improvements to the machine learning methods through each application and are excited to see the improvements yield good results across imaging platforms.

Interested in learning how this could help with your data? Please contact any of the team members: Fernanda Lecaros Saavedra, Colleen Durkin, Rob Sherlock, Steve Haddock, Tom O'Reilly, Duane Edgington or Danelle Cline.





Individual Activities

- Michael Anderson
- Kevin Barnard
 - Out of Office
 - Apr 3, 2025 – robotics competition
 - Apr 16, 2025 - Apr 17, 2025 – vacation
 - May 8, 2025 - May 9, 2025 – vacation
 - May 22, 2025 - May 23, 2025 – vacation
 - Jun 3, 2025 - Jun 10, 2025 – vacation
 - Jun 11, 2025 - Jun 15, 2025 – CVPR
 - Aug 7, 2025 – vacation
 - Aug 11, 2025 - Aug 12, 2025 – vacation
- Francois Cazenave
 - 901405 - Wave-Energy Conversion for Oceanographic Applications
 - Buoy, PTO and mooring preparations for deployment
 - 902106 - Niobicon-Based AUV Docking Development
 - Preparations for AUV docking deployment
 - Installed new threaded inserts in Brizo
- Danelle Cline
 - 901103 - Biodiversity and Biooptics of Zooplankton
 - Trained ViTs model with 500+ added Ctenophora sp. A training images mined from video tracking pipeline run on 900+ hours of Haddock dives + remapping of concepts. Balanced accuracy improved from .80 to .88 !!

- Modified optimized tracking pipeline for strided inference in preparation for running longer time series.
 - Continued exploration on using k8 for scaling.
- 901502 - Ocean Soundscape
 - Worked on prepping the recording machine for hydrophone deployment next Thursday. Many thanks for all the teamwork on this, especially Andrew McCann, Bryan Touryan-Schaefer, and Adriana. Firewall issues resolved and Windows setup for ssh/rsync. Tested file transfer using Microsoft windows subsystem (wsl) from MARS to MBARI which was fast.
 - Migrating code from Bitbucket to Github
 - PBP maintenance
 - Summer intern discussions
- 901902 - Unoccupied Aerial Vehicles for Science, Operations and Outreach
 - Team discussion on level processing and strategies for full automation that support multiple platforms
 - Attended [Modovolo](#) webinar
 - Simple POC RestAPI for processing from a UI deployed to VM uav.shore.mbari.org
 - Summer intern discussions
 - Searching for velella velella in recent missing where they were washed up on shore revealed potential groups at sea. Resolution is difficult to confirm.
 - Continued work on ai documentation at <https://docs.mbari.org/internal/ai>
- 902111 - Carbon Flux Ecology
 - Loaded low and high magnification planktivore cluster data into annotation server mantis.
 - Generated new training data for Fernanda
 - Continued work on ai documentation at <https://docs.mbari.org/internal/ai>
 - Added support for reading YAML configuration from URL
- Overhead
 - Sick day
 - Tech talk on Argo
- Duane Edgington
 - 500055 - VARS, M3/RS, DSG
 - Clean up of AWS accounts 902005_dev (development & test) and 902005_vaa (production) per request of Kyra/video lab. 902005_vaa transitioned to 670000_dev (our group AWS sandbox), and 902005_dev purged to near zero cost.
 - 901103 - Biodiversity and Biooptics of Zooplankton
 - Team meeting, discussion with Steve H. and Danelle C.
 - 901502 - Ocean Soundscape
 - Continued work evaluating google kaggle multi-species whale model against our MARS Pacific Ocean Sound recordings. Ready to run some RAW audio files with known detections (blue whale, etc)
 - Zoom interview with 2 top intern candidates
 - 901902 - Unoccupied Aerial Vehicles for Science, Operations and Outreach
 - Team meeting
- Jon Erickson
- Kevin Gomes
 - Out of Office
 - Mar 24 - Vacation
- Andy Hamilton
- Kent Headley
 - 300078 - DMO Support - AUV

- Addressed comments for code review of pull request for change set with Dorado sim w/ TRN in the loop
 - Attended Hyperion meeting
- 902405 - Precision Control Technologies
 - Refactoring TRN plugin for LASS DVL on Ventana. Rejiggered the nav corrections for vehicle and LASS DVL (on rotating arm); these are different, and the new versions should also inform how the corrections work across other plugins.
 - Refactored TRN geometry representation classes, adding base class accessor methods..
 - Wrote new TRN plugin for Norbit multibeam on miniROV
 - Data is flowing in new plugins, though still testing whether TRN is working; for Norbit and LASS DVL, there are issues with the inputs, e.g. limited view, low vehicle speed, etc. May not be able to know without new data sets that address these issues.
 - Code review pull request
- Overhead
 - Office relocation
 - TWIC renewal (San Jose)
- Out of Office
 - 4/1 San Jose (morning only)
 - July 14-31 (vacation)
- Rich Henthorn
 - 902305 - Event Detection Using the Sedimentation Event Sensor
 - Acoustic modem consolidation
 - 902306 - SINKER
 - Some minor refactoring of SINKER motor controllers
 - 902405 - Precision Control Technologies
 - LRAUV TRN (LRTRN) documentation
 - Alternative filters
 - Overhead
 - Benthic Rover transfer updates
 - Out of Office
 - Mar 31 - Apr 2: WFH
 - Apr 3 - Vacation
- Akshay Hinduja
 - 902204 - Scalable Robotics
 - Norbit Driver: Change socket read behavior to non-blocking, update socket reads to run on independent threads instead of single. Able to achieve lcm message rate parity with norbit ping rate.
 - Norbit sk7 translator: Integrated navigation information into bathy records through nearest neighbor search based on timestamp. Changed log reading behaviour to replicate live stream instead of earlier possibly more efficient way of using deque per message type. This allows better nearest neighbour search for nav - wbms integration.
 - BlueBoat: Updated driver, wrote service scripts for gui and config mode
- Brett Hobson
- Irene Hu
 - 901217 - Chemical Sensors
 - Support for code development
 - 901805 - Coastal Biogeochemical Sensing Program
 - Tested breadboard alk circuit using resistors for load, plotted data

- Made connectors for mini ISUS; testing and troubleshooting. 50pin header is reversed and one baseboard seems to have assembly errors
- 901904 - Deep-Sea Coral-Sponge Community Observatory
 - Added more features to SWIR code including linear actuator (PWM based), current measurement (INA209), get system data
 - Commands list and list of tests
 - System diagram
- Overhead
 - OBS research specialist interviews
- Out of Office
 - April 10: dr appt, WFH
- Scott Jensen
 - 808015 - Monitoring McCloud
 - Preparation and determining required equipment
 - Power needs and power station design
 - Overhead
 - Cleaning out stores of batteries
 - Out of Office
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- Brent Jones
 - Out of Office
 - Dr appointments for injured hand
- Chad Kacy
 - Out of Office
 - Out of office on Fridays
- Brian Kieft
 - 901513 - Targeted Sampling by AUVs
 - Mission reviews for Yanwu's tests this week.
 - 902101 - LRAUV Technology Development
 - Multiray debug/refactor
 - Data review on various Galene issues from last week
 - Shore launched Ahi on Monday for i2map and engineering work. Recovery planned Thursday
 - Fixed up joystick a little on lab machine to enable recovery of Galene at the beach
 - Wrote a new surface transit mission for shore launches.
 - Added some debugging to MMP for testing offshore when available
 - Confirmed cause for Galene dropweight incident.
 - Working with dash5 team on automated deployments and various issues. Still planning on Q2 beta testing.
 - Beginning bringup of Opah (1500m mesopelagic vehicle)
 - Assisting Cole in writing new i2map mission
 - Overhead
 - Collaboration agreement with TNC renewed.
 - Beginning work on tutorial for Oceans. Paper review for Quinn
 - Out of Office
 - 4/9-19 (MDT)
 - 6/16-24 TBD (UTC+2)
 - 9/15-30 (UTC+2)
- Denis Klimov
- Eric Martin
 - 901101 - Seafloor Mapping

- We have completed a mostly successful visit to 3D@Depth in Colorado to train and test a new lidar system.
 - Out of Office
 - Traveling 3/30-3/31 to Colorado for lidar FAT
- Thom Maughan
 - 300083 - DMO Support - LRAUV
 - Backplane pcbs have been hand assembled and are ready for test. Varsha and Cole doing a great job keeping forward momentum.
 - 901217 - Chemical Sensors
 - Serial commands are implemented
 - NO3 calculation and File IO are work in progress.
 - Aadu Prakash of UW, age 32, passed away on 28 Mar 2025. Our kind, positive and capable firmware engineer who has been my primary interface to UW will be greatly missed.
 - Revising test plan and evaluating options for filling gaps on UW regression suite.
 - Working bug list and managing contractor...
 - Schedule pressure is high
 - 902004 - Planktivore
 - Paul and Brent have been carrying the load on Planktivore.
 - Out of Office
 - TBD, Trip to UW after MSC3 passes our test plan
- Mike McCann
 - 200109 - Core Mooring Data - MDUC
 - Some M1 real time data processing debugging
 - 901101 - Seafloor Mapping
 - Met with Dave & Jenny to discuss potential outside services contract for next year
 - 901910 - Plankton Taxonomic Groups from AUVs
 - Doing last refinements of HS2 and Ecopuck backscatter calculations/comparisons
 - Waiting for & willing to help on the profile oriented corrections to the proxy variables
 - 902403 - Expedition DB Modern
 - Thinking about how best to do test driven development on expd-django's expd-next branch
 - Out of Office
 - 8-9 May
- Paul McGill
 - 701147 - MARS O&M IV
 - Zoom meeting with UW to discuss testing of board sets
 - 902401 - Geo-Sense
 - Analyzed data to look for gravity-flow events on MARS DAS
 - Looking for earthquakes in Geo-Sense DAS data
 - Overhead
 - Helped R/V Packard with shore power connection
 - Actually started cleaning my office for retirement
- Enoch Nicholson
- Tom O'Reilly
- Mike Risi
 - 200105 - Core Navigation - MDUC
 - Deployed navproc 2.0 during the Rachel Carson maintenance period
 - Working on small navproc 2.0 deployment issues
 - 901101 - Seafloor Mapping
 - Continuing work on new LASS control system
 - Starting to implement deployed LASS trigger board firmware

- LASS AUV scoping meetings
- 902405 - Precision Control Technologies
 - Testing RovLib Framework in lass-control development
 - Working on Ventana interface to midwater tracking control system
 - Starting development on new UI for stereo KCF tracker
- Out of Office
 - Offsite on Tuesday and Friday
 - March 3 - March 6, 2025 - vacation
 - June 2 - June 6, 2025 - vacation
- Paul Roberts
- Brent Roman
 - 708184 - ESP Monitoring PNW
 - Some stress at NOAA early in the week due to a software bug in the rewritten ESP camera driver in the Linux kernel.
 - Needed to run on newer kernels, but “best practices” broke driver on older ones!
 - Took 2 days to find and fix with conditional #defines depending on kernel version
 - 901205 - ESP SURF Center
 - Got almost everything ready for calibrating 100 ESP 3G heater boards starting next week.
 - Working with Enoch on creating two water baths with the board switching between them
 - To form a 2-point linear calibration
 - 902304 - Piscivore Cam
 - Sent EOI and got 2-week early access to their development portal for pre-purchase evaluation
 - Overhead
 - Finally moving my main Linux desktop to 64-bit user space with Encrypted BTRFS
 - Everytime I update Linux, it breaks Bluetooth 😞
- Carlos Rueda
- Karen Salamy
 - Out of Office
 - Personal Bereavement April 9-14, 2025 - Family funeral
 - On-campus 3 days/week (**T, W, TH**). New OFFICE - G106.
- Brian Schlining
 - 500055 - VARS, M3/RS, DSG
 - Support for the upcoming Mini ROV's trip to the arctic.
 - Updates to ML visualization software
 - Working with IS as we migrate all videos from titan to thalassa
 - 901221 - Midwater Time Series
 - Looking into issues with transect volume calculations from ACM data for a few midwater transects from the ROVs.
 - 902002 - FathomNet
 - Re-verify that image set up loads are working now the MSU has turned on the FathomNet-to-NCEI data hosting pipeline.
 - Looking into issues with some CSV upload not registering correctly
 - 902403 - Expedition DB Modern
 - Continuing work on the new database design and REST API.
 - Out of Office
 - Mar 28 - Apr 2 - Vacation
- Alana Sherman
 - 902208 - Mini ROV Operations
 - Now packing for the cruise
 - Updating documentation

- Locating and ordering parts
- 902401 - Geo-Sense
 - Packed up original unit to return to the UK
- Overhead
 - Packard (!@#!@) tour and multiple seminars
- Out of Office
 - Helped at school event last Friday
- George Stern
 - 300078 - DMO Support - AUV
 - Looked at process controllers to add cycle programming to smaller pressure chamber
 - 902304 - Piscivore Cam
 - Identified coax cable and connector options for a GMSL3 test
 - Began ordering Framos parts for the test
 - 902306 - SINKER
 - Continued working on closed can charging script
 - Finished harnessing and system diagram for the closed can architecture
 - Ordered parts
 - 902106 - Niobicon-Based AUV Docking Development
 - Began researching feasibility of underwater wifi hotspot, antenna designs and cots software defined radio options - just need to lower the the frequency by a GHz
 - Continued search for suitable modem chipsets - identified a few more and ordered the most promising in an inconvenient commercial package
- Justin Tucker
 - 901007 - Benthic Biology & Ecology
 - Ongoing review and updates to BRS drawings
 - BRS pump troubleshooting
 - 901101 - Seafloor Mapping
 - Finished LASS INS upgrade bracketry drawings
 - AUV concept sketch models
 - 901405 - Wave-Energy Conversion for Oceanographic Applications
 - Mooring line pull angle study
 - Out of Office
 - Expected leave April 1st - 30th
- Johann Voigtlander
 - 902204 - Scalable Robotics
 - MiniROV in test tank for final Arctic tests
 - I deployed the blueboat in the harbour and tested the RTK GPS and Norbit multibeam.
 - Working on Blueboat 4G/5G modem integration with Adriana
 - 902208 - Mini ROV Operations
 - Re-installed Norbit
 - Fixed issues from mobile rack -> container swap
 - Designed and printed mount for ice drill on drawer and quiver
 - 902402 - CSEM
 - Winch control panel parts ordered
 - Black winch cover being made
 - Out of Office
 - Dec 16th - Jan 10th - Vacation