

Tom O'Reilly Sorted By Project

300082 - DMO Support - Wave Glider

- Working with Chris Wahl and Liquid Robotics to upgrade onboard Python version from 2.7 to 3.x. Python 2 is near end-of-life, and most new applications are written in Python 3. (Week 8)
- Preparing 'Hotspot 3' payload for deployment on Wave Glider to support ECOHAB and CANON campaigns - integrated and tested new cellular modem, Benthos DAT and acoustic modem, Iridium satellite modem. (Week 14)
- Operated Hotspot tracking/stalking of LRAUV brizo in support of CANON; evaluating potential modifications to software that would improve tracking accuracy. (Week 15)
- Working with Chris Wahl to prepare new Wave Glider sensor management computer (SMC) for deployment, new LRAUV tracking application developed by Carlos Rueda (Week 48)

901009 - CANON

- Tom was invited by an Open Geospatial Consortium working group focused on standards for networked robots and sensors, to talk about MBARI's autonomous CANON fleet at their February meeting. Tom's presentation describes software being developed by him and Carlos Rueda that will enable better situational awareness and robot-to-robot coordination. (Week 6)
- Met with Carlos Rueda, Kevin Gomes, and Kongsberg engineers to discuss their development of standards-based mission planning tools that manage underwater, surface and aerial vehicles with a wide variety of protocols; their system has similar goals to our management of the CANON autonomous fleet. (Week 8)

901101 - Seafloor Mapping

- Improving MB-System installation process by moving away from antiquated 'autotools' approach to CMake (Week 4)
- Developing prototype bathymetry editor using C++ and VTK/Qt graphical toolkits for MB-System, intended to upgrade existing 'mbeditviz' tool which is based on end-of-life Motif/X11. The new editor makes use of existing MB-System libraries which read and write sonar data files in a very wide variety of manufacturer formats. (Week 6)
- Developed cmake scripts to build MB-System libraries and executables, which will replace the "auto-tools" currently used. Our experience is that software such as MB-System that runs on multiple platforms and operating systems is more easily built and installed with cmake than auto-tools.. (Week 6)
- Integrating existing MB-System 'C' libraries with C++ prototype bathymetry editor - reuse of well-tested MB-System code is a key goal of our upgrade effort (Week 8)
- Refining C++ gridded map visualizer, adding capability to select points (Week 34)
- Continuing to refine bathymetry visualization prototype (Week 38)
- Refining bathymetry display prototype app, utilizes up-to-date software tools and libraries. This application and others will eventually replace MB-System applications that are based on no-longer-supported libraries. (Week 41)
- Gave status update to Dave Caress and Jenny Paduan. (Week 46)
- Working with Dave Caress and Kent Headley to refine MB-System 'cmake' build scripts and procedures. cmake builds are significantly easier to specify and maintain than the older 'auto-tools' approach currently used by MB-System (Week 48)

901112 - Monterey Bay Time Series

- Participated in Imaging Flow Cytobot (IFCB) operations training with McLane engineers (Week 18)
- Met with project team, Hamilton and Cazenave to discuss potential IFCB integration with power buoy (Week 18)
- Testing, learning, and evaluating the McLane imaging flow cytobot (IFCB) Linux software in the lab. Until recently IFCB ran Windows 10, however McLane intends to replace Windows with Linux, and has released a beta version which we are evaluating. The Linux GUI is better organized, more responsive and seems more robust than Windows so far. Based on this evaluation we may run the Linux version when IFCB is deployed on Power Buoy or M1 mooring. (Week 19)
- Conducted tests of IFCB microscope integrated with Power Buoy onboard network and cell modem (Week 22)
- Testing IFCB operation and calibration procedures (Week 22)
- Prepared and held Imaging Flow Cytobot (IFCB) readiness review in preparation for upcoming IFCB integration and deployment on MBARI's power buoy. (Week 32)
- Successfully deployed Imaging Flow Cytobot (IFCB) on wave energy buoy on August 20, telemetry now being received on shore. Excellent image quality, can be viewed at the IFCB dashboard. (Week 34)
- Worked with team to more effectively utilize buoy cell modem connection for IFCB telemetry retrieval. (Week 34)
- Brief selection of images (Week 34)
- Worked with McLane labs and collaborator UCSC collaborator Patrick Daniel to remotely troubleshoot and restore functionality of IFCB microscope deployed on power buoy in Monterey Bay. (Week 44)

901513 - Targeted Sampling by AUVs

- Developing and testing automatic acoustic relay function on Wave Glider "Hotspot 3" payload, which will automatically relay messages between LRAUVs and shore. Plan to test during CANON and ECOHAB campaigns (Week 14)
- Worked with Chris Wahl and Liquid Robotics to prepare new Wave Glider Sensor Management Computer (SMC) for MBARI applications. (Week 46)

901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach

- Working with team on science camera integration and test (Week 2)
- Working with team to define next flight procedures, e.g. image scale calculation based on overflight of ground calibration targets (Week 2)
- Working with team to integrate and test science camera with Believer fixed-wing UAV (Week 4)
- Working through Coursera/Stanford Machine Learning online course, which will have application to UAV image processing (Week 4)
- Helped team prepare abstract presentation for 2022 proposal (Week 22)
- As project manager, starting to plan tasks, milestones, resources and budget for phase 1 (Week 22)
- Working with team to plan workshop, where Bryan and Ben will bring rest of team and collaborators up to date on Believer UAV construction and configuration (Week 38)
- Prepared and carried out tests of science camera mounted in Believer fixed-wing UAV; prepared calibration targets, calculated and set shutter speed to eliminate motion-blur, and analyzed resulting images of targets from overflights at 100 meters elevation - actual scale in good agreement with calculations, we can expect ~1 cm/pixel resolution at sea surface with this camera. (Week 44)
- Reviewed results of latest test flights, planning for 2022 activities and schedule. (Week 46)

901913 - Demonstrating high-speed communication with a submerged AUV

902009 - AUV UI

902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans

- Working with team and Rockland Scientific to scope potential integration of MicroRider turbidity sensor with Coastal Profiling Float (Week 4)
- Working with project team to develop use cases in which near-realtime telemetry from deployed turbidity sensor would be useful; most candidate vehicle hosts for the sensor provide only low-bandwidth Iridium satellite link, which limits the telemetry volume. Working with instrument vendor to scope effort to enable telemetry, which we might propose for 2022. (Week 8)
- Overhead (Week 13)
- Met with Rockland engineers, MBARI team to discuss potential 2022 project proposal (Week 18)

902101 - LRAUV Technology Development and Fleet Operations

- Working with Kieft to test and refine WHOI software that relays commands and data between LRAUV and shore via Wave Glider Hotspot (Week 4)
- Adapting WHOI acoustic-satellite relay software to MBARI Hot Spot Wave Glider, to relay commands and data between shore and submerged LRAUV (Week 6)
- Developing Wave Glider Hot Spot command-data relay between submerged LRAUVs and shore, in preparation for April ECOHAB experiment (Week 8)
- Refined Hotspot acoustic relay software; ready for at-sea testing during ECOHAB campaign (Week 15)
- Testing Hotspot acoustic relay in lab with multiple LRAUV vehicles/modems. (Week 18)
- Working with team to add Wave Glider 'hotspot' acoustic relay capability. Currently working to add shore-side support, including dispatch of acoustic commands through the LRAUV 'dash' GUI. (Week 19)
- Refining Wave Glider "hot spot" acoustic relay software; automatically relays messages between AUVs and shore via acoustic and cell modem. Running image transfer tests between LRAUV, hot spot, and shore to support Katija's Bio-inspiration lab tracking project. (Week 41)
- Testing Wave Glider 'hotspot' acoustic relay to software to transfer data between shore and submerged LRAUVs (Week 46)
- Extending acoustic comm system such that larger files (e.g. camera images) can be transmitted, e.g. to Wave Glider 'Hot Spot' (Week 48)

Other - working with Dorado team to evaluate how to upgrade main vehicle computer from long out-of-date QNX to modern Linux OS

Out of Office

Overhead

- Gave invited lecture at Rotary Club of Santa Cruz: "Argo: Window into Earth's Ocean and Climate". Many thanks to Ken Johnson, Heidi Cullen, Peter Walz, Chris Scholin and George Matsumoto for their help. (Week 46)