# Tom O’Reilly

## Week 52

- 300082 - DMO Support - Wave Glider
- 901009 - CANON
- 901101 - Seafloor Mapping
- 901112 - Monterey Bay Time Series
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
- 901913 - Demonstrating high-speed communication with a submerged AUV
- 902009 - AUV UI
- 902101 - LRAUV Technology Development and Fleet Operations
- 902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans
- Overhead
- Out of Office

## Week 51

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## Week 49

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## Week 48

- 300082 - DMO Support - Wave Glider
    - Working with Chris Wahl to prepare new Wave Glider sensor management computer (SMC) for deployment, new LRAUV tracking application developed by Carlos Rueda
- 901009 - CANON
- 901101 - Seafloor Mapping
    - 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
- 901112 - Monterey Bay Time Series
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
- 901913 - Demonstrating high-speed communication with a submerged AUV
- 902009 - AUV UI
- 902101 - LRAUV Technology Development and Fleet Operations
    - Extending acoustic comm system such that larger files (e.g. camera images) can be transmitted, e.g. to Wave Glider ‘Hot Spot’
- 902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans
- Overhead
- Out of Office

## Week 47

- 300082 - DMO Support - Wave Glider
- 901009 - CANON
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- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
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- Out of Office

## Week 46

- 300082 - DMO Support - Wave Glider
- 901009 - CANON

- 901101 - Seafloor Mapping
    - Gave status update to Dave Caress and Jenny Paduan.
- 901112 - Monterey Bay Time Series
- 901513 - Targeted Sampling by AUVs
    - Worked with Chris Wahl and Liquid Robotics to prepare new Wave Glider Sensor Management Computer (SMC) for MBARI applications.
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
    - Reviewed results of latest test flights, planning for 2022 activities and schedule.
- 901913 - Demonstrating high-speed communication with a submerged AUV
- 902009 - AUV UI
- 902101 - LRAUV Technology Development and Fleet Operations
    - Testing Wave Glider 'hotspot' acoustic relay to software to transfer data between shore and submerged LRAUVs
- 902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans
- 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.
- Out of Office

## Week 45

- 300082 - DMO Support - Wave Glider
- 901009 - CANON
- 901101 - Seafloor Mapping
- 901112 - Monterey Bay Time Series
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
- 901913 - Demonstrating high-speed communication with a submerged AUV
- 902009 - AUV UI
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- 902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans
- Overhead
- Out of Office

## Week 44

- 300082 - DMO Support - Wave Glider
- 901009 - CANON
- 901101 - Seafloor Mapping
- 901112 - Monterey Bay Time Series
    - 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.
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
    - 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.
- 901913 - Demonstrating high-speed communication with a submerged AUV
- 902009 - AUV UI
- 902101 - LRAUV Technology Development and Fleet Operations

- 902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans
- Overhead
- Out of Office

## Week 43

- 300082 - DMO Support - Wave Glider
- 901009 - CANON
- 901101 - Seafloor Mapping
- 901112 - Monterey Bay Time Series
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
- 901913 - Demonstrating high-speed communication with a submerged AUV
- 902009 - AUV UI
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- 902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans
- Overhead
- Out of Office

## Week 42

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- 901009 - CANON
- 901101 - Seafloor Mapping
- 901112 - Monterey Bay Time Series
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
- 901913 - Demonstrating high-speed communication with a submerged AUV
- 902009 - AUV UI
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- 902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans
- Overhead
- Out of Office

## Week 41

- 300082 - DMO Support - Wave Glider
- 901009 - CANON
- 901101 - Seafloor Mapping
    - 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.
- 901112 - Monterey Bay Time Series
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
- 901913 - Demonstrating high-speed communication with a submerged AUV
- 902009 - AUV UI
- 902101 - LRAUV Technology Development and Fleet Operations
    - 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.
- 902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans
-

- Out of Office

## Week 40

- 300082 - DMO Support - Wave Glider
- 901009 - CANON
- 901101 - Seafloor Mapping
- 901112 - Monterey Bay Time Series
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
- 901913 - Demonstrating high-speed communication with a submerged AUV
- 902009 - AUV UI
- 902101 - LRAUV Technology Development and Fleet Operations
- 902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans
- 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

## Week 39

- 300082 - DMO Support - Wave Glider
- 901009 - CANON
- 901101 - Seafloor Mapping
- 901112 - Monterey Bay Time Series
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
- 901913 - Demonstrating high-speed communication with a submerged AUV
- 902009 - AUV UI
- 902101 - LRAUV Technology Development and Fleet Operations
- 902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans
- 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

## Week 38

- 300082 - DMO Support - Wave Glider
- 901009 - CANON
- 901101 - Seafloor Mapping
    - Continuing to refine bathymetry visualization prototype
- 901112 - Monterey Bay Time Series
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
    - 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
- 901913 - Demonstrating high-speed communication with a submerged AUV
- 902009 - AUV UI
- 902101 - LRAUV Technology Development and Fleet Operations
- 902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans
- 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

## Week 37

- 300082 - DMO Support - Wave Glider
- 901009 - CANON
- 901101 - Seafloor Mapping
- 901112 - Monterey Bay Time Series
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
- 901913 - Demonstrating high-speed communication with a submerged AUV
- 902009 - AUV UI
- 902101 - LRAUV Technology Development and Fleet Operations
- 902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans
- Out of Office

## Week 36

- 300082 - DMO Support - Wave Glider
- 901009 - CANON
- 901101 - Seafloor Mapping
- 901112 - Monterey Bay Time Series
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
- 901913 - Demonstrating high-speed communication with a submerged AUV
- 902009 - AUV UI
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- 902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans
- Out of Office

## Week 35

- 300082 - DMO Support - Wave Glider
- 901009 - CANON
- 901101 - Seafloor Mapping
- 901112 - Monterey Bay Time Series
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
- 901913 - Demonstrating high-speed communication with a submerged AUV
- 902009 - AUV UI
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- 902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans
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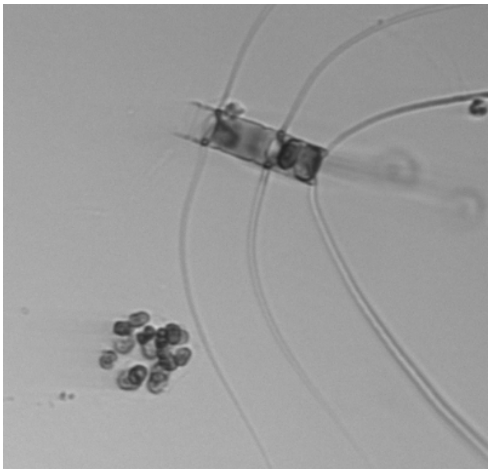
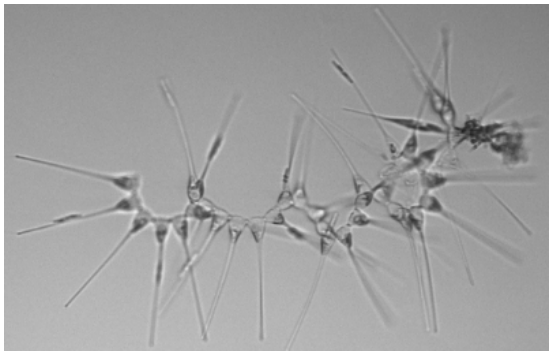
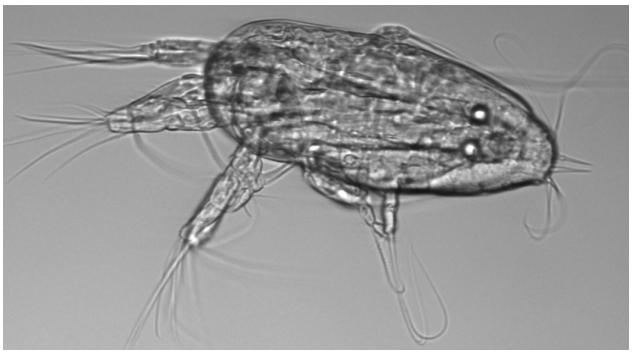
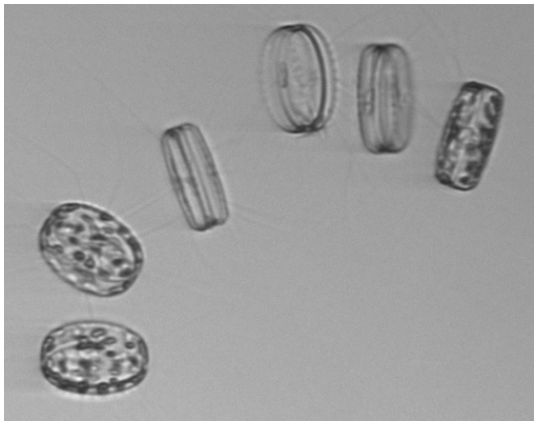
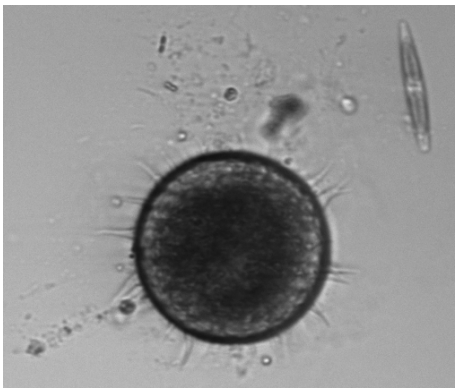
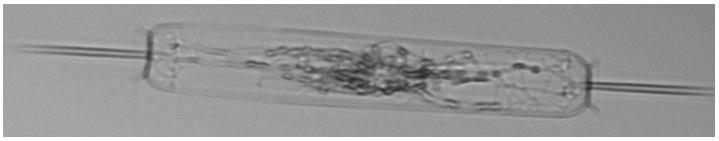
## Week 34

- 300082 - DMO Support - Wave Glider
- 901009 - CANON
- 901101 - Seafloor Mapping
    - Refining C++ gridded map visualizer, adding capability to select points
- 901112 - Monterey Bay Time Series
    - 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.
    - Worked with team to more effectively utilize buoy cell modem connection for IFCB telemetry retrieval.

- Brief selection of images

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## Week 32

- 300082 - DMO Support - Wave Glider
- 901009 - CANON
- 901101 - Seafloor Mapping
- 901112 - Monterey Bay Time Series
    - Prepared and held Imaging Flow Cytobot (IFCB) readiness review in preparation for upcoming IFCB integration and deployment on MBARI's power buoy.
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
- 901913 - Demonstrating high-speed communication with a submerged AUV
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## Week 31

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- 901913 - Demonstrating high-speed communication with a submerged AUV
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- 902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans
- Out of Office

## Week 26

- 300082 - DMO Support - Wave Glider
- 901009 - CANON
- 901101 - Seafloor Mapping
- 901112 - Monterey Bay Time Series
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
- 901913 - Demonstrating high-speed communication with a submerged AUV
- 902009 - AUV UI
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## Week 25

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- 901009 - CANON
- 901101 - Seafloor Mapping
- 901112 - Monterey Bay Time Series
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
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- 901009 - CANON
- 901101 - Seafloor Mapping
- 901112 - Monterey Bay Time Series
- 901513 - Targeted Sampling by AUVs
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- 902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans
- Out of Office

## Week 23

- 300082 - DMO Support - Wave Glider
- 901009 - CANON
- 901101 - Seafloor Mapping
- 901112 - Monterey Bay Time Series
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
- 901913 - Demonstrating high-speed communication with a submerged AUV
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- Out of Office

## Week 22

- 300082 - DMO Support - Wave Glider
- 901009 - CANON
- 901101 - Seafloor Mapping
- 901112 - Monterey Bay Time Series
    - Conducted tests of IFCB microscope integrated with Power Buoy onboard network and cell modem
    - Testing IFCB operation and calibration procedures
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
    - Helped team prepare abstract presentation for 2022 proposal

    - As project manager, starting to plan tasks, milestones, resources and budget for phase 1
- 901913 - Demonstrating high-speed communication with a submerged AUV
- 902009 - AUV UI
- 902101 - LRAUV Technology Development and Fleet Operations
- 902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans
- Out of Office

## Week 21

- 300082 - DMO Support - Wave Glider
- 901009 - CANON
- 901101 - Seafloor Mapping
- 901112 - Monterey Bay Time Series
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
- 901913 - Demonstrating high-speed communication with a submerged AUV
- 902009 - AUV UI
- 902101 - LRAUV Technology Development and Fleet Operations
- 902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans
- Out of Office

## Week 20

- 300082 - DMO Support - Wave Glider
- 901009 - CANON
- 901101 - Seafloor Mapping
- 901112 - Monterey Bay Time Series
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
- 901913 - Demonstrating high-speed communication with a submerged AUV
- 902009 - AUV UI
- 902101 - LRAUV Technology Development and Fleet Operations
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- Out of Office

## Week 19

- 300082 - DMO Support - Wave Glider
- 901009 - CANON
- 901101 - Seafloor Mapping
- 901112 - Monterey Bay Time Series
    - 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.
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
- 901913 - Demonstrating high-speed communication with a submerged AUV
- 902009 - AUV UI
- 902101 - LRAUV Technology Development and Fleet Operations
    - 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.

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

## Week 18

- 300082 - DMO Support - Wave Glider
- 901009 - CANON
- 901101 - Seafloor Mapping
- 901112 - Monterey Bay Time Series
    - Participated in Imaging Flow Cytobot (IFCB) operations training with McLane engineers
    - Met with project team, Hamilton and Cazenave to discuss potential IFCB integration with power buoy
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
- 901913 - Demonstrating high-speed communication with a submerged AUV
- 902009 - AUV UI
- 902101 - LRAUV Technology Development and Fleet Operations
    - Testing Hotspot acoustic relay in lab with multiple LRAUV vehicles/modems.
- 902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans
    - Met with Rockland engineers, MBARI team to discuss potential 2022 project proposal
- Out of Office

## Week 17

- 300082 - DMO Support - Wave Glider
- 901009 - CANON
- 901101 - Seafloor Mapping
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
- 901913 - Demonstrating high-speed communication with a submerged AUV
- 902009 - AUV UI
- 902101 - LRAUV Technology Development and Fleet Operations
- 902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans
- Out of Office

## Week 16

- 300082 - DMO Support - Wave Glider
- 901009 - CANON
- 901101 - Seafloor Mapping
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
- 901913 - Demonstrating high-speed communication with a submerged AUV
- 902009 - AUV UI
- 902101 - LRAUV Technology Development and Fleet Operations
- 902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans
- Out of Office

## Week 15

- 300082 - DMO Support - Wave Glider
    - Operated Hotspot tracking/stalking of LRAUV brizo in support of CANON; evaluating potential modifications to software that would improve tracking accuracy.
- 901009 - CANON

- 901101 - Seafloor Mapping
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
- 901913 - Demonstrating high-speed communication with a submerged AUV
- 902009 - AUV UI
- 902101 - LRAUV Technology Development and Fleet Operations
    - Refined Hotspot acoustic relay software; ready for at-sea testing during ECOHAB campaign
- 902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans
- Out of Office

## Week 14

- 300082 - DMO Support - Wave Glider
    - 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.
- 901009 - CANON
- 901101 - Seafloor Mapping
- 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
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
- 901913 - Demonstrating high-speed communication with a submerged AUV
- 902009 - AUV UI
- 902101 - LRAUV Technology Development and Fleet Operations
- 902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans
- Out of Office

## Week 13

- 300082 - DMO Support - Wave Glider
- 901009 - CANON
- 901101 - Seafloor Mapping
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
- 901913 - Demonstrating high-speed communication with a submerged AUV
- 902009 - AUV UI
- 902101 - LRAUV Technology Development and Fleet Operations
- 902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans
    - Overhead
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## Week 12

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## Week 8

- 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.
- 901009 - CANON

    - 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.
- 901101 - Seafloor Mapping
    - 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
- 901513 - Targeted Sampling by AUVs
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    - Developing Wave Glider Hot Spot command-data relay between submerged LRAUVs and shore, in preparation for April ECOHAB experiment
- 902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans
    - 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.
- Overhead
- Out of Office

## Week 7

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## Week 6

- 300082 - DMO Support - Wave Glider
- 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.
- 901101 - Seafloor Mapping
    - 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.
    - 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..

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- 902101 - LRAUV Technology Development and Fleet Operations
    - Adapting WHOI acoustic-satellite relay software to MBARI Hot Spot Wave Glider, to relay commands and data between shore and submerged LRAUV
- 902018 - Mixing Rates from Autonomous Profiling Floats in the Coastal Oceans
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## Week 5

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## Week 4

- 300082 - DMO Support - Wave Glider
- 901009 - CANON
- 901101 - Seafloor Mapping
    - Improving MB-System installation process by moving away from antiquated ‘autotools’ approach to CMake
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
    - Working with team to integrate and test science camera with *Believe*r fixed-wing UAV
    - Working through Coursera/Stanford Machine Learning online course, which will have application to UAV image processing
- 901913 - Demonstrating high-speed communication with a submerged AUV
- 902009 - AUV UI
- 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
- 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
- Overhead
- Out of Office

## Week 3

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- 901101 - Seafloor Mapping

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## Week 2

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- 901101 - Seafloor Mapping
- 901513 - Targeted Sampling by AUVs
- 901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach
    - Working with team on science camera integration and test
    - Working with team to define next flight procedures, e.g. image scale calculation based on overflight of ground calibration targets
- 901913 - Demonstrating high-speed communication with a submerged AUV
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