# 901101 - Seafloor Mapping

## Week 51

1. Kent Headley
    a. Updated the TRN CMakelists build configuration files in libtrnav and MB-System to improve readability, remove unneeded stuff, support all libtrnav targets (which may be put into an optional build group).
    b. Sync'd trndev branch w/ master and libtrnav
    c. Reviewing work started 2025/03 to update ROV TRN to improve TRN plugin algorithm implementations and potentially fix issues, along with other TRN core updates based on input from Steve Rock.

## Week 50

1. Kent Headley
    a. syncing repos
    b. returning to some work started earlier this year related to using TRN on ROVs
2. Mike McCann
    a. Looked over Karen's feature branch code changes deployed on smdb-dev
    b. Advising capstone students, namely about merge conflicts with mbgrd2gltf
3. Mike Risi
    a. LAS AUV scoping meetings
4. Karen Salamy
    a. Fixed the database load deletion on my development server smdb-dev following the VM upgrades last week. The download of the database took several hours to complete. I now have a nightly backup system to hopefully avoid the deletion from occurring on the server again.
    b. The new development server for the SMDB project can be found at:

## Week 49

1. Mike McCann
    a. Counseling the capstone students through a merge conflict issue
    b. With Plankton Proxies work at a checkpoint can now start on the SMDB infrastructure update
2. Karen Salamy
    a. Planning final upgrades to the SMDB Dash and push to the production server next week.

## Week 47

1. Eric Martin
    a. Lidar checkin, still not very available, need to do some validation too.
    b. LASAUV meeting
2. Mike Risi
    a. LASSAUV scoping meetings
    b. Review of proposed TCU changes

## Week 46

1. Eric Martin
    a. Meeting last week with 3d@depth, following up this week.
    b. Checking out some software fixes.
2. Mike McCann
    a. Set up cron job to email latest M1 sound speed profile data to science team on the Packard
3. Karen Salamy
    a. Set up a new test server (smdb-dev) for updating the SMDB dash. This allows me to test all of the missions and UI edits prior to creating a pull request for the production site.
    b. Began addressing issue fixes for the science team on the new test server including map display for the home page, filtering of missions on the home page map, drawing a bounding box of missions (filtered and unfiltered) that will then produce and exportable spreadsheet of each mission in the bounding box.
4. Justin Tucker
    a. Updates to eye safe cover for LIDAR

## Week 45

1. Eric Martin
    a. Following up with 3d at depth, still issues
    b. TCU updates
    c. New Reson wiring review
    d.
2. Mike McCann
    a. Meeting to discuss impact of the project infrastructure update issue
    b. Fixed problem with Pandas interpreting Excel Spreadsheet blank lines as float(NaN)s
3. Mike Risi
    a. LASSAUV scoping meeting

## Week 44

1. Karen Salamy

    a. Began refreshing my memory of building the SMDB local system. I plan to start working on the SMDB UI to complete various users requests for the system next month.

## Week 43

1. Eric Martin
    a. Follow-up tasks from 10/6-10/8 Expedition
    b. Documenting Lidar bugs & transmitting to Kraken (3D@Depth)
    c. Phinstasmic analysis
    d. Rebooting the concept design work
2. Mike McCann
    a. Met with capstone students who are showing good progress on fixing up mbgrd2gltf
    b. Wrote m1_soundspeed.py script for using during Paull's Packard cruise next month

## Week 42

1. Eric Martin
    a. We had a successful 3 days offshore with Ventana, though some issues did arise as we brought a new Phinstasmic online and further tested the new lidar.
        i. Ongoing issues with the science port on Ventana at 57600 bps
        ii. The phinstasmic was quite noisy on its dvl channel
        iii. The position on the phinstasmic was jumping while dvl aiding
        iv. The lidar still needs new features fully tested.
    b. Data backup and analysis is underway.
    c. We'll be back in the tank today to collect a few more data
2. Karen Salamy
    a. Met with Jenny Paduan regarding the outlined work for me on the SMDB GUI
    b. She mentioned that work on it will be delayed for a month or so due to an overhaul of the code by Mike M.
3. Justin Tucker
    a. LASS follow up on post cruise tasks

## Week 41

1. Mike Risi
    a. LASS deployment cruise series

## Week 40

1. Eric Martin
    a. LASS Cruise prep
    b. Phins cal cruise last Friday was unsuccessful, we will attempt again tomorrow.
2. Mike Risi

    a. Testing LASS changes in test tank
    b. Preparing for LASS cruise series next week
3. Justin Tucker
    a. LASS deployment prep

## Week 39

1. Eric Martin
    a. Phins Bringup & Broadcaster software
    b. Interface can checkout
    c. Received Lidar, testing
    d. Building the sled back up for 10/6-10/8 deployment.
2. Mike Risi
    a. Finished up and tested process to send navigation data to the new Phins INS
    b. Making changes to power can GUI
    c. Switch LASS control over to ventana-ext-infc
    d. General cruise prep for October 6th cruise series
3. Justin Tucker
    a. Deployment prep and assembly of LASS

## Week 38

1. Mike Risi
    a. GOB power can stack firmware completed and installed on power can.
    b. Power can GUI completed and installed on TCU.
    c. Working on a process to send navigation data to Phins INS using the ixblue standard messaging protocol.

## Week 37

1. Eric Martin
    a. Phase II feedback last week on 902606
    b. Starting INS work, checking in with the team.
2. Mike McCann
    a. Presented Interactive 3D Visualization of the Seafloor paper at the Web3D Conference

## Week 35

1. Mike McCann
    a. Submitted PR in attempt to fix reported problem building MB-System on Ubuntu 22
    b. Reading up on glTF file format and getting ready for presentation at Web3D 2025
2. Mike Risi
    a. GOB and LASS controller firmware changes for October nearly complete
    b. Working with Chad on UI changes for LASS GOB stack.

## Week 34

1. Mike McCann
    a. Busy SIGGRAPH meeting – learned a lot more about about glTF, Cesium, and 3D Tiles
    b. Submitted capstone student project for refining the mbdrg2gltf code in MB-System
2. Justin Tucker
    a. Support for continued updates to LASS orientation plate

## Week 33

1. Eric Martin
    a. Arctic Prep
    b. Lidar Vendor meeting, progress is slow, but will be on time.
2. Mike McCann
    a. Conversations and presentations about X3DOM + OGC 3D Tiles at SIGGRAPH

## Week 32

1. Eric Martin
    a. Phins+Tasman assembly
    b. Handing off efforts to Arctic
2. Mike McCann
    a. Some preparation for SIGGRAPH Carto BoF talk next week
3. Mike Risi
    a. Finishing up board to board communication of LASS GOB stack
    b. Working on commands for GOB computer board and LASS system board
    c. Modifying GUI to working with new LASS GOB stack

## Week 31

1. Eric Martin
    a. 3D at Depth meeting Jul 29, 2025
    b. PhinsTasmic buildup
2. Justin Tucker
    a. INS build support

## Week 30

1. Mike McCann
    a. Presented X3D and 3D Tiles for Oceanographic Data Visualization poster at ESIP

## Week 29

1. Eric Martin
    a. Proposal in last week
    b. Lab setup, cleanout
    c. Sled prep for remachining of the plate.
    d. Getting Spun up on INS work.
2. Mike McCann
    a. Preparing poster for ESIP Summer meeting
3. Mike Risi
    a. Continuing firmware for GOB board
    b. Working on LASS control system UI updates
4. Justin Tucker
    a. Orientation plate and bracket updates

## Week 28

1. Eric Martin
    a. Proposal writing
2. Mike McCann
    a. Final revisions to Web3D Conference paper
    b. Contributed proposal text, including statement of work for outside services
3. Mike Risi
    a. LASAUV proposal review and input
    b. GOB HIH sensor working, moving on to LASS system board firmware

## Week 27

1. Eric Martin
    a. Proposal writing
2. Mike McCann
    a. Addressing reviewers comments on paper submitted to the Web 3D Conference
    b. Working on poster for ESIP Summer Meeting
    c. Working on next year's proposal
3. Karen Salamy
    a. Met briefly with Jenny P. about when my time will be needed this year to address various issues for the SMDB (October, 2025) and how many hours may be needed for next year in the current proposal process.
4. Justin Tucker
    a. LASS orientation plate modification design
    b. Proposal support

## Week 26

1. Mike Risi
    a. LASS AUV scoping meeting

b. Working on GOB computer board firmware for LASS

## Week 25

1. Kent Headley
    a. Fixed issue in mbtrnpp in Ubuntu 24 build found by Dave C. The symptom was a SIGABRT raised by snprintf (actually snprintf_chk). Turns out _*FORTIFY*_SOURCE is enabled by default on Ubuntu24. Fortified source is a security feature to detect things like buffer overflows. Depending on how it is configured (as well as things like optimization, GNU_SOURCE, etc.), it provides compile time warnings and may replace various string and memory functions with it's own ostensibly more secure versions - e.g. snprintf_chk - that check for risky conditions.

    In this case, it raised SIGABRT at run time due to in invalid value for the buffer length argument passed to snprintf. Though the value was incorrect (+1 too large), the operation would not have overflowed the buffer. The fortified version of snprintf should have been able to determine that, so in that sense it's a false positive. It's concerning that it may bring a program down without warning; while it's a potentially useful security feature, it should be used carefully in the context of autonomous systems. It can be disabled/configured using the -D_*FORTIFY*_SOURCE compiler flag.
2. Mike McCann
    a. Working on poster for ESIP
    b. Working on my part of the proposal text
3. Karen Salamy
    a. I am planning to return to work on this project after the M1 and SINKER deployments in mid-July.
4. Justin Tucker
    a. AUV proposal refinement
        i. 6DOF mass and foam updates
        ii. Housing cost estimates

## Week 24

1. Kent Headley
    a. Performing timing tests on new decimation code. Dave C is reporting significantly increased run times when comparing new code to tag used for 2024 Axial. Working to reproduce those results.
    b. The TRN performance does seem to be improved in the new code, which may be due to the new decimation, or another change recommended by Steve Rock recently that was implemented after Axial 2024.
2. Eric Martin
    a. Lab setup
    b. Board meeting materials for Dave.

3. Karen Salamy
    a. Discussed helping Jenny P. in late July with the SMDB GUI.
4. Justin Tucker
    a. LASS Lidar position estimate
    b. AUV proposal, 6DOF cost and mass estimate

## Week 23

1. Justin Tucker
    a. Proposal support, battery packaging

## Week 22

1. Mike McCann
    a. Submitted industrial use case paper for Web3D 2025

## Week 21

1. Eric Martin
    a. Setting goals

## Week 20

1. Eric Martin
    a. Follow up work on the cruise, repairing strobes.
    b. Meetings with 3D@Depth and preparing to return ship the unit to Colorado for continued work.
    c. Abstract presentation work
2. Mike Risi
    a. LASS AUV scoping meeting

## Week 19

1. Eric Martin
    a. Hosted 3d At Depth two weeks ago for Lidar tank testing followed by offshore work on the Carson last week and Monday, completing a large milestone of accepting this new system into the LASS.
    b. We are also drafting an abstract as follow on work to our scoping study.
    c. Moving forward with debrief of the cruise which will require shipment of the lidar back to colorado, refactoring of some of the sensor package, and assembly and calibration of a new Phins/Tasman.
2. Mike Risi
    a. Lidar CCI testing during tank tests
    b. LASS cruise series on Rachel Carson to test new WiSSL 2.0 Lidar

## Week 16

1. Kent Headley
    a. synced MB-System wit libtrnav (changes to ROV TRN, add TRN utilities to build)
2. Eric Martin
    a. LASS AUV Scoping Meeting
    b. Arctic Planning
    c. Lidar integration planning, will be in tank next week.

## Week 15

1. Kent Headley
    a. looking at issue in mbtr
2. Mike McCann
    a. Further discussions about adding OGC 3DTiles support to X3DOM

## Week 14

1. Eric Martin
    a. We have completed a mostly successful visit to 3D@Depth in Colorado to train and test a new lidar system.
2. Mike McCann
    a. Met with Dave & Jenny to discuss potential outside services contract for next year
3. Mike Risi
    a. Continuing work on new LASS control system
    b. Starting to implement deployed LASS trigger board firmware
    c. LASS AUV scoping meetings
4. Justin Tucker
    a. Finished LASS INS upgrade bracketry drawings
    b. AUV concept sketch models

## Week 13

1. Kent Headley
    a. Cruise next week cancelled (see precision control)
2. Eric Martin
    a. Lots of lidar meetings
    b. FAT will be 3/31
    c. Sled prep in test tank, slight ground fault but everything is working now.
3. Justin Tucker
    a. New INS bracket design
    b. Graphics for abstract creation

## Week 12

1. Kent Headley
    a. Chatted with Dave re upcoming April/May cruise days. Many moving parts, and plan is still in flux, but may want to try TRN on Ventana/LASS, possibly using Norbit and/or Reson sonars. It's a pretty short fuse (Apr 1-2). The Norbit requires new TRN code; working to get TRN for ROV up and running again. Justin Tucker provided some coordinate measurements for TRN sensors.
2. Eric Martin
    a. Prepping for cruise, lots of strobe issues to work through
    b. Bringup of system on new control PC
    c. Tank testing in the next week
    d. The Lidar build continues to experience significant delays, though is very close.
3. Justin Tucker
    a. AUV concept study
        i. Battery sphere battery packing efficiency
        ii. LASS graphics for simulation
        iii. Concept study mass and buoyancy calc updates
    b. Existing sled coordinate system exports

## Week 11

1. Eric Martin
    a. Lidar Meetings
    b. Scoping Work for Abstracts
    c. Sled bringup in Bldg G
    d. Strobe debugging w/ Chad
2. Mike Risi
    a. Starting work on deployed LASS board firmware
    b. Replaced Euler with Loon in TCU and starting work on LASS prep for April
3. Justin Tucker
    a. AUV concept 3D mock ups

## Week 7

1. Mike Risi
    a. LASS AUV scoping meetings
    b. Loon configuration and documentation largely complete
    c. Getting prototype firmware ready for LASS board
2. Justin Tucker
    a. Update AUV battery mass estimates

## Week 6

1. Mike McCann

    a. Met with folks from Ocean Exploration Trust to discuss getting our data into RUMI 3D viz
2. Karen Salamy
    a. Working on Github requests for viewing the map and data pages on a screen-only device like a pad or phone.
3. Justin Tucker
    a. Compiled  payload mass budget for AUV proposal
    b. Kinematic analysis for reversed ram placement on LASS

## Week 5

1. Eric Martin
    a. 3D at depth meeting 1/28
    b. Kickoff Meeting last Thursday, started scoping work
    c. Strobe testing with Chad
2. Mike Risi
    a. LASS AUV scoping study and data budget
    b. Continuing to document the workstation Loon configuration process
3. Karen Salamy
    a. Checked in a few enhancement updates for issues this week.

## Week 4

1. Karen Salamy
    a. Reviewed various dives and issues on Github.
2. Justin Tucker
    a. Worked on benchmarking strobe thermal improvement
    b. Mapped out strobe hydraulic layout

## Week 3

1. Eric Martin
    a. Call last week with 3d at Depth
2. Mike Risi
    a. Testing of GOB Ethernet prototype circuit for the new LASS relay and trigger control board stack
    b. Working on control upgrades for April/June deployment
    c. Configuring new Linux workstation for TCU to be deployed in April
3. Justin Tucker
    a. Strobe model updates for screenshots/renders of Jason on LASS for NSF proposal

## Week 2

1. Eric Martin
    a. Design review for thruster drive eval board.

    b.
2. Justin Tucker
    a. Thermal experiment flow simulation to assess pressure and thermal uniformity through nozzle array.
    b. CAD model updates for as built sled strobe arms

## Week 1

1. Kent Headley
    a. Searching for root cause of a baffling bug, which appears to be some form of memory corruption. A member object is fine when accessed via one method, but not from another when accessed in exactly the same way.
2. Justin Tucker
    a. AUV design trade studies