Scuba.Tech Meeting Notes for 2024-2025 Winter Project

(Miscellaneous and planned)

-----

# 2024-12-17 – MEET AND GREET! 😊

*NOTE: These notes were originally drafted by Zoom AI, and reviewed by Christopher*

**Quick recap**

The team from Scuba Dot Tech, a nonprofit focused on 3D survey and open source marine survey, discussed their winter project, research work, and upcoming summer internship. They also proposed a project for Geddy to undertake over the winter break, involving researching zebra mussels and creating an animated gif, a predictive map, and a summary report. The team also discussed their upcoming project involving data visualization and GIS, and the potential for another drawdown around February.

**Next steps** *(AI Summary – not considered authoritative)*

1. Geddy to analyze historical trends of invasive species at Candlewood Lake from 2007-2020.
2. Geddy to create animated GIS-based map showing invasive plant species and zebra mussel presence.
3. Geddy to research zebra mussel growth preferences (substrates, temperature, alkalinity, etc.).
4. Geddy to identify high-risk zones for zebra mussels in Candlewood Lake based on research.
5. Geddy to create a predictive map synthesizing data from YouTube videos and research conclusions.
6. Geddy to write a summary report on findings and trends.
7. Christopher to share project folder and resources with Geddy.
8. Christopher to add Geddy to Google Workspace in January with a scuba.tech email address.
9. Scuba Tech team to include Geddy in future field events and training trips.

**Summary**

Scuba Dot Tech's Winter Project

The team from Scuba Dot Tech, a nonprofit focused on 3D survey and open source marine survey, introduced themselves and discussed their winter project. Christopher, the team leader, explained their mission to reduce barriers to entry in maritime survey and improve data science techniques. He also mentioned their plans for research work in preparation for the spring diving season and an upcoming summer internship in Connecticut freshwater lakes. Joshua, another team member, shared his background in engineering and his passion for ROVs and science. Henry, the board secretary, expressed his interest in incorporating data science and visualization into their work with Scuba Tech. The team also discussed their cyclical work pattern, with the winter focused on research and development, the spring on maintenance and training, the summer in the field, and the fall on reporting and research wrapping up.

Data Storage and Shipwreck Project

The team discussed their current data storage needs and the scale of their data operations. Christopher explained that they are currently operating at about half capacity, with a data velocity of 40 TB per year, and most of their inputs are image data. They also discussed their upcoming project, which involves creating a 3D map of a shipwreck at the bottom of the sea. Sid joined the meeting and shared his origin story, explaining how he became involved with the team through his work with the Sea Shepherd Conservation Society. The team also introduced Adam, a particle physicist who has been helping with their scientific methodology and grant writing.

Developing Invasive Species Management Program

Christopher presented a plan to work with the State of Connecticut to develop an internship and original research program focused on addressing the threat of aquatic invasive species, specifically zebra mussels, in Candlewood Lake and Ball Pond. The program would integrate environmental DNA monitoring with submersible remotely operated vehicles, photogrammetry, and educational materials. The aim is to guide resource managers in developing targeted management strategies and to create a replicable model for other communities facing invasive species challenges. The proposed deliverables include a presence/absence determination of zebra mussels, Edna monitors, photogrammetric surveys, 3D modeling of areas of interest, educational media production, and a comprehensive outreach plan.

Candlewood Lake Invasive Species Mapping

Christopher discussed the need for a more detailed and visualized map of Candlewood Lake, focusing on the presence of zebra mussels and other invasive species. He mentioned that while a formal survey in 2019 found no zebra mussels, there have been informal reports since then. He proposed creating an animated map showing the movement of seagrasses and substrate types over time, using data from previous years. He also suggested the possibility of mapping the distribution of different substrates in the lake and tracking their changes over time. Christopher emphasized the need for more specific data, as the last formal survey was conducted in 2020.

Animated Infographic on Invasive Species

Christopher proposed an animated infographic project to visualize the historical trends of invasive species at Candlewood Lake from 2007 to 2020. The project would also incorporate preliminary insights on the zebra mussel spread. The team discussed the potential challenges, such as data preparation and integrating known zebra mussel sightings into the project. Christopher emphasized the importance of Geddy's role as a researcher and the potential for credit in future publications and animations. The project would involve creating a GIS-based map, a time series visualization, and possibly a zebra mussel research component.

Zebra Mussel Research Project Proposal

Christopher proposed a project for Geddy to undertake over the winter break. The project involves researching zebra mussels, identifying their preferred substrates, temperature, and depth, and correlating this information with Candlewood Lake. Geddy is to create an animated gif, a predictive map, and a summary report based on the findings. The project aims to support the summer internship program and will be open-sourced. Christopher emphasized that Geddy is the lead of the project and that the timeline is estimated to be 2 to 3 weeks.

Underwater Map Coordinate Point Discussion

Geddy discussed the need to incorporate various coordinate points into an underwater map, suggesting the use of a grid and time series alignment. He also expressed concern about the impact of different polygon sizes on the map's accuracy. Christopher proposed sharing a project folder with Geddy, which would contain all relevant materials and give him full read and write access. They agreed to review the best email for communication.

Zebra Mussels in Candlewood Lake

Christopher discussed the findings from a recent webinar about zebra mussels in Candlewood Lake. He mentioned that the mussels are too deep for drawdown to eliminate them entirely and that a map of the drawdown should be cross-referenced with a map of the mussels' locations. He also noted that the last formal survey was in 2020 due to budget constraints. Christopher then introduced Ball Pond, which has no recorded history of zebra mussels and is connected to Candlewood Lake by a single creek. He proposed to use a remotely operated vehicle (ROV) and eDNA sensors to verify if zebra mussels are present in Ball Pond, which would be a valuable scientific outcome.

Geddy's Involvement in Winter Project

Christopher introduced Geddy to the team and outlined the expectations for his involvement in the winter project, which will lay the foundation for a summer component. Christopher also invited Geddy to present his piece at any exhibitions or trade shows and assured him of credit if he couldn't attend. The team uses Google Workspace enterprise and will add Geddy to the domain in January. Christopher also invited Geddy to join field events and training trips, and shared examples of community work and educational projects the team is involved in. Joshua and Henry shared their experiences of driving the robot and getting wet during field trips.

Data Visualization and GIS Project

In the meeting, the team discussed their upcoming project involving data visualization and GIS. Henry shared his senior project plans, which involve building weather stations to monitor marine environments using Raspberry Pi and PVC pipe. The team also discussed the importance of data visualization for Scuba Tech's future. Christopher shared the project proposal and the resources folder, including links to relevant data and updates on zebra mussel sightings. The team also discussed the potential for another drawdown around February. Sid expressed his excitement about the project, given his proximity to the project sites. The team agreed to maintain open communication and to use a persistent Zoom link for any discussions.