NTNU

Norwegian University of Science and Technology
Department of Marine Technology

TMR4585 Underwater Technology 2019
Project work

Report outline

The report shall cover the field activity performed during the cruise with Gunnerus. The report shall also set the lectured material and the curriculum provided in a context. The preface of the report shall contain a description of the individual contributions for each group member. The report will be the basis for a presentation and for the oral examination.

1. Introduction
    - Background and motivation for the operation
    - Description of goal for the operation
    - Description of prior knowledge of process of interest
    - Desired data and information from the cruise
2. Theory
    - Literature survey:
        - Concepts of seabed mapping, underwater navigation, data processing, error propagation, and underwater vehicle design
        - Similar operations
        - Similar technology
        - Conditions and operations in the area
        - Phenomena of investigation
3. Method
    - Description of equipment:
        - Vehicles
        - Instruments
        - Communications âĂŞ what data is transferred from the vehicles to the operators during the operation.
            * Means/methods

        * Data
    - Description of planned operation
        - Ops sequence
            * Pre-dive procedure
            * Operations
            * Post dive operations
        - Vehicle operations procedures
        - Weather windows and alpha factor
        - Contingency plans
    - HSE considerations
    - Description data processing flow
    - Map of area
    - Expected navigation error budget âĂŞ propagated error budget
    - Discussion of error sources
    - Description of planned missions with maps
    - Description of essential parameters
4. Results
    - Instrument readings presented to address target of investigation
    - Maps with results
        - Interpolation maps
        * T, S, chl-a, O_2
        - Seabed maps
            * Bathymetry
            * Sonar mosaic of coverage
            * List/table of targets
            * Seabed classification
    - ROV survey trajectory
        - Length of transect
        - Table of targets (biological, geological, anthropogenic)
    - Error sources and experienced accuracy for collected data
    - Statistical considerations of payload and navigation data
    - Accuracy of navigation
        - IMU, GPS, DVL, USBL
5. Discussion
    - Fidnings of the results

    - What does the results mean?
    - What concepts, features and objects are we seeing in the data?
    - Provide an assessment of the quality of the data collected and processed and suggest how it be improved
    - How can the concepts and features seen in the data be explained?
  - Operational experiences
    - If equipment is faulting, discuss why and how to avoid in the future
    - Usage of time
6. Conclusion
   - Investigation findings
   - Operational experiences
7. References
8. Appendixes
   - Scripts and code
   - Maps, plots and images