

Ocean Tech Proposal on behalf of Saltus Grammar School, Bermuda

Applicant Details

Paul Wright, Teacher of Science and Physics. 28 May 1969, English.

Organisation Details

Saltus Grammar School, 108 St John's Road, Pembroke, HM06. Est: 1888

Mission Statement: "Inspiring students to lead us to a more just, fair and sustainable world."

email: pwright@saltus.bm phone: 292 6177

Www: www.islandphysics.com

Project Summary

Mapping the Salinity and Temperature Variation due to the Outfall of the Reverse Osmosis Plant at Tyne's Bay and its Effect on the Nearby Reefs

Primary focus: education.

Secondary focus: research

Project location: North Shore around Tyne's Bay.

Habitat: Lagoon and reefs

Project Description

1. The reefs immediately offshore from Tyne's Bay RO plant have suffered from extensive beaching due to either or both the increased salinity and temperature of the discharged water. The extent of this plume of water could be mapped by the REMUS AUV and compared to photographic records of the reefs. Perhaps the oxygen levels could be recorded as well. The ROV could be used from a small boat to record video images of various reefs to support the observational data. Students could help the planning of the surveying and compare and contrast the operation of the AUV to that of an ROV – including both the buoyancy and control systems.
2. My interest in this would be for the older ROV students, who are particularly interested in Marine Technology and Science. I also have an AP Physics student who wishes to study Marine Engineering at university who would be a good fit for this challenge.
3. Conservation Challenge - the reefs that surround the waters of Bermuda are of critical importance to the island, socially and economically. They are under increasing environmental pressures from changes to the water environment that they are in. Organisms take a long time to adapt to changes and these changes are occurring rapidly. Increased awareness and objective data would help to highlight to the population the direct and indirect consequences of human development on the natural habitat.

4. At the moment, this may be a one-off project, but could be extended in future years.
5. Results and conclusions could be presented to the media and to the public by presentations or displays at the Aquarium, BUEI and BIOS as well as at the school.
6. Methodology Summary - Students assist the OceanTech staff to plan a surveying pattern to map an area of the waters around the outfall of the RO plant. This would need to be planned around weather patterns matching the prevailing winds in Bermuda and operation of the RO plant. The sweep should extend far enough to show the extent of the plume of higher temperature and salinity water until it has dispersed to match the surrounding waters. If oxygen content could be measured, perhaps that changes too? Students could also work with the Aquarium staff to compare the reefs in the affected waters to those that are outside the region - this could be videoed using their homemade ROVs.
7. This project is unique (I think) because the REMUS AUV can get a short-duration and detailed, wide-spread map of the temperature and salinity, whereas in the past sampling has been manually carried out by point-sampling from boats over a wide time frame. Also, it has the opportunity for the students to use quite different underwater robotic devices for research and all the problems and challenges that they will present.
8. As far as I know, this is either a unique project or an extension on work that the Aquarium is already doing.
9. The data will be processed by the students with assistance from teachers and OceanTech staff. Aquarium?
10. Data will be used for education, research and possible publicity of environmental awareness.
11. Personnel from Saltus: myself and Tanja Walker
12. Deployment vessel costs: unsure at this time - will ask Aquarium for use of *Endurance*.
13. Students: Mostly high school, but may involve some older middle school students. The older students have competed in several BIOS ROV competitions and are enthusiastic about science and engineering. Teacher has experience with underwater instrumentation and vehicles from his time working at NOCS.
14. If successful, we will be very happy to show the results and project work to other schools.
15. Lessons involved could be: geography, science and marine science.

Why?

I think that this is exactly the sort of project that REMUS is designed for and is ably suited to increase the knowledge of the effect of the output of the RO plant on Bermuda's coral reef ecosystem. Involving both schools and students in the work will help to raise the profile of environmentalism, conservation, OceanTech, Aquarium and others.