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Dear sir/madam,

I am currently a final year student at the University of Plymouth, studying Marine Biology and Oceanography, expected to graduate in May 2015. I am interested in how climate induced changes in oceanographic processes – upwelling in particular – and anthropogenic inputs in to the ocean, affect the marine ecosystem dynamics, whether this be on the rocky shore, within the plankton, or in the deep-sea.

In the 2014-15 academic year, my final year project for university is focusing on how the movement of the South American sun star *Heliaster helianthus* is altered depending on a) what substratum they are on, and b) the height of the algae (*Gelidium chilense*) they are on. The point mentioned in 'b' is altered by the amount of upwelling in that area, which is also changing with intensifying winds caused by an increase in greenhouse gasses. For the proposal I wrote for this project, I scored 69%.

These changes in upwelling also cause changes in plankton dynamics, where in particular I looked at the changing dynamics in *Dinophysis spp.* blooms, which is a genus that causes Harmful Algal Blooms through causing Diarrhetic Shellfish Poisoning. I was required to prepare an 8-minute long presentation for this, investigating this topic from the point of 3 recent (since 2007) papers. For this presentation, I scored 80%.

I am also excited to be doing a 25 minute-long presentation in February, that I have been preparing over the past few months on deep sea mining and if this is necessary, and how it would be affecting people's lives as well as the marine community in these mining areas. As this is a growing area of industry, with 7 new licenses issued in the last year, I thought it was important to investigate in to this so as to gain an understanding in determining whether it really is necessary to mine the deep sea and whether there are any alternatives to this. Working on this topic was when my interest for the deep-sea started growing, especially when I heard about the increasing megafauna population due to increased food/nutrient inputs at the base of the Monterey Bay Fan. I think it is important to investigate the further effects of the increased inputs in this area, as it may have a bottom-up/top-down effect on the food chain, which may in turn affect fisheries or the dynamics of Harmful Algal Blooms. It is normally assumed that the deep sea remains un-affected from anthropogenic sources, but in an area like the Monterey Bay Fan, where the deep sea is relatively close to the coastline, the case is different. Working with Dr. Kerry Howell at the University of Plymouth on creating a deep-sea identification guide for echinoderms was also a point where my interest for the deep-sea was enhanced. For this project, I was required to see if taxonomical identification features of Asteroids could be applied to digital imagery. I think that this is particularly applicable to the project I wish to work on with Dr. Smith and Dr. Haffard.

I would also like to work with Dr. Barry on how the Oxygen Minimum Zone affects the distribution and abundance of the megafauna and macrofauna found in the Gulf of California. This is also an important concept as the OMZ depth may decrease with intensifying upwelling, which could also affect the local currents. I believe my experience with Dr. Howell is relevant and will assist me with working on this project. In my second year at university, we were involved in oceanographic measurements in the Tamar Estuary, in Plymouth, and the Gullmarsfjord in Sweden, using a CTD. We were then required to analyse the data obtained and produce a report, arriving at a logical conclusion for the data collected at the Tamar Estuary. For this report, I scored 79%.

I believe that my experience presented above, combined with my interest and enthusiasm in changing oceanographic processes affecting the marine environment will ensure that I make the most of the Summer Internship at MBARI, while presenting MBARI with the best of my efforts, reliable data and publish-worthy results.

Yours sincerely,

Melisa Vural