STRATEGIC MEETING FOR A SOUTHERN OBSERVATORY

Ushuaia (Argentina), 9-13 October 2017

Rationale

Changes in climate induced by human activity since the beginning of the industrial era and their effects on the planet are a fact accepted by most of the scientific community, the public and policy makers. These changes, mainly due to the direct and indirect effects of increased concentrations of greenhouse gases in the atmosphere, result in the increase in air and sea temperature and the consequent sea level rise, ocean acidification, among other disturbances. These perturbations significantly affect ecosystem services and marine resources in general both in the open ocean and coastal areas. However, it should be noted that about 70% of the world population is associated with coastal marine and terrestrial associated ecosystems. The economic importance of coastal areas is huge in terms of fishing, transportation, are major recreational and touristic areas and of major importance for human and ocean health, among other activities ($ 12.6 trillion in terms of ecosystem services). In this context, the likely synergistic effects of stress generated by climate change must be considered as an added disturbance to exploitation activities and pollution. Models predict a temperature increase between 2 and 6 ° C by the end of this century (IPCC), as well as a 0.3-0.4 units decrease in pH (acidification, Rost et al. 2008), while it is expected that global sea level will rise by about 1 m in the next 100 years. All these models have many uncertainties associated, especially because of the lack of data and the limitations in computing power, but all agree as to the global trends.

This initiative should establish **a strong link between basic science, monitoring and local stakeholder groups and population.** Education, both in terms of training of highly qualified personnel at the technical and university levels as well as the dissemination of knowledge at scholar level, the public and policy makers, will be a central objective in this observatory project.

Scope

Sub-polar ecosystems are located in the regions on Earth most affected by climate change. Consequently, there is an urgent need for integrated inter-disciplinary research to better understand the direct and indirect effects of increased greenhouse gases (increased temperature and ocean acidification) on these environments.

Here we propose an integrated terrestrial - coastal marine ecosystems monitoring network focusing in the **Subantarctic Patagonian region** (Beagle Channel). However, this is an open idea, and discussions about the integration with other high latitude regions in the Southern and Northern Hemispheres (i.e. **the Western Antarctic Peninsula, the Canadian Arctic** and **the Estuary and Gulf of St. Lawrence** in Canada) or elsewhere are welcome.

In some of these areas, long-term interdisciplinary observatories are already running while in others they must be implemented. These observatories may consist of sensors installed on the seabed, water column moorings, multiparametric buoys, gliders, ferryboxes, discrete observations from ships and coastal stations, among others.

Applications

In addition to Climate Change long-term environmental monitoring, data collected by this type of observatory will contribute to: 1) support marine and terrestrial bio-economic initiatives in sub-polar areas (i.e. integrated multitrophic aquaculture and other fisheries ventures; sustainable agriculture and forestry, etc.); 2) assess the effects of ocean acidification on carbonaceous organisms of commercial interest (i.e. bivalves and marine arthropods); 3) produce high quality data useful for navigation and tourism; 4) the early detection of oil spills and toxic red tides and 5) validate physical oceanographic models useful for navigation and for the elaboration of contingency plans for the prevention and control of contamination impacts, among others. All these services are essential for long-term sustainable economic development, as well as to provide highly qualified information to policy makers.

Within the above framework, the goal of the workshop is to bring together managers and users of observatory facilities to discuss about the best observatory concept to be built in Tierra del Fuego. The final product of the workshop should be a document that will serve as the conceptual basis for the preparation of an international initiative for the installation of a climate change high latitude marine observatory network. This workshop will be strongly linked to the "*Dynamics of the impact of ice mass loss in the Andes on terrestrial, limnic and marine ecosystems of Patagonia* (DynAmo)" project.