Geophysical Research Abstracts,
Vol. 11, EGU2009-13220, 2009
EGU General Assembly 2009


# Regional climate scenario projections of impact on a coastal Marine Protected Area in Labrador, Canada

S. Best, E. Demirov, and J. Wroblewski
Memorial University of Newfoundland, St. John's, Canada (entcho@mun.ca)

The study of the impact of coastal regions due to various climate scenarios is essential. It allows for inferences of present day environmental conditions and issues, and provides predictions of the impact on the future environmental conditions and climate based on various global populations and emission trends. A particular interest of this study is the Gilbert Bay region in Labrador, Canada. This area was established in 2005 as the first marine protected area in the Canadian subarctic coastal zone.

Our study presents results from regional projections of IPCC scenarios to the Gilbert Bay region and simulates future variability in water column properties, which can be driven by potential future climate changes. The ocean model is the General Ocean Turbulence Model - GOTM (Umlauf, Burchard, Bolding, 2007), which was applied in four model experiments. The first experiment it is driven by IPCC present day climate simulations. The atmospheric forcing in the other three model experiments is taken from three of the IPCC climate scenarios simulations: A1B, A2 and B1.

All of the scenarios simulations indicated an increase in temperature and salinity in Gilbert Bay, and decrease in the sea-ice formation with respect to present day climate. A2 scenario displayed the greatest change. The stratification in the bay in A2 scenario simulations is weaker than the present day water column stratification, which may have potential impacts on biological processes including problems for the resident Atlantic cod population (Wroblewski, *et al.*, 2007). While all of the scenarios simulations suggest that in 2100 the sea-ice will decrease with respect to the present day, this year in A2 scenario simulations of Gilbert Bay is ice-free.

**Works Cited**

Umlauf, L., Burchard, H., Bolding, K. (2007). GOTM: Sourcecode and Test Case Documentation. Retrieved from GOTM: http://www.gotm.net/index.php?go=documentation

Wroblewski, J. S., Kryger-Hann, L. K., Methven, D. A., Haedrich, R. L. (2007). The fish fauna of Gilbert Bay, Labrador: a marine protected area in the Canadian subartic coastal zone. *Journal of the Marine Biological Association of the United Kingdom*, 87: 575-587.