



Toward a better hindcast of waves in the Arctic Ocean

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Climate change has affected the entire Arctic Ocean and in particular its Pacific Sector where the minimum of the summer ice extent was observed during the last decade. Diminishing sea ice has yielded greater fetch thus affecting surface waves all around the Alaska. To better represent the wave hindcast in the Pacific sector, we present modeling results of the WAM model configured for the Pacific Sector of the Arctic Ocean and a novel way to assimilate wave information into the wave models using the Reduced space 4Dvar (R4Dvar) data assimilation approach. The model results include the validation of several wind products for the region and comparison with in situ and satellite observation. The employed assimilation method does not require development of the tangent linear and adjoint codes for implementation. It is based on minimization of the cost function in a sequence of low-dimensional subspaces of the control space. The twin-data experiments show that assimilation of the wave data allows improved wave hindcast and forecast. The future plans are to extend this project to the Northern Pacific (including Hawaii region) and analyze the inter-connection between wave activity in different regions.