

## **The Representer Method: Theory and Applications to Ocean Data Assimilation**

Hans Ngodock<sup>a</sup> and Matthew Carrier<sup>b</sup>

<sup>a</sup>*Ocean Data Assimilation and Probabilistic Prediction, Naval Research Laboratory, USA,*  
[hans.ngodock@nrlssc.navy.mil](mailto:hans.ngodock@nrlssc.navy.mil)

<sup>b</sup>*Ocean Data Assimilation and Probabilistic Prediction, Naval Research Laboratory, USA*

The representer method is a data assimilation or generalized inverse technique that allows both strong and weak constraints formulations and minimizes the cost function in observations space. This is particularly suitable to ocean data assimilation where observations are sparse and regional models, especially in coastal applications, suffer from significant error levels in atmospheric forcing fields due to poor resolution of the atmospheric models. The theoretical background will be presented, as well as numerical results from applications with the Navy coastal ocean model.