1. Introduction

A USDA/NASA funded program is performing near-real time altimetric monitoring of the largest lakes and reservoirs around the world. The near-real-time stage measurements are currently derived from incoming data from the NASA/CNES Jason-2/OSTM mission. Archived data from the NASA/CNES Topex/Poseidon and Jason-1 missions, and from the NRL GFO mission are also utilized to provide historical time series variations from 1992-2008. The program is currently being expanded and enhanced by including the ESA ERS and ENVISAT data sets which will allow the additional monitoring of ~500 lakes. Radar, lidar and ground-based data sets are all used for validation exercises. The USDA/FAS utilize the products for assessing irrigation potential (and thus crop production estimates), and for general observation of high-water status, shortterm drought, longer-term climatic trends, and anthropogenic effects. Here, we report on the overall performance and contribution of the Poseidon-3 radar altimeter IGDR data set, in terms of overall product quality and quantity. We also present the first ENVISAT products and demonstrate how the Jason-OSTM and ICESat-1 data sets are being used as relative validation sources.

2. NRT from Jason-2/OSTM

Acquiring targets ~150km2, ~800m wide, within 0.1-2.5secs of the data sets are being used as relative validation sources.

3. New ENVISAT products and their validation

(Left) Validation of the ENVISAT time series. (Left) Lake Ontario and comparison with ground-based gauge data from Olcott, (Centre) Lake Victoria (right) Lake Chad and relative validation via utilization of the ICESat-1 GLAS GLA14 laser data set.

4. Benchmarking + End Users

GRLM end-users (e.g., acad., pub., com., gov., etc., including FAS foreign resource analysts, international governments, lake development agencies and networks, humanitarian organizations, conservation groups, etc.) and applications include: (1) real-time flood warning, (2) water resources, (3) agricultural water management, (4) fish productivity, (5) regional security, (6) vegetation ecology. Researchers have utilized the products for hydrological modeling and studies of climate change, as well as a validation tool for various studies and models. The lake level variations are also being seen as a new climatic index. End-user requirements vary according to application but there is a need for a homogeneous, consistent, global water level data record across all platforms. Emphasis is on product accuracy particularly range determination, and wind/ice/land effects.

References: