Science program in preparation for the MDR

Quantification of Hydrology Science Returns From the Baseline and Threshold Missions

A Brief Introduction

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Key Roles of the SDT

SWOT

Science Requirements

Science Questions
Key Roles of the SDT

How well have we defined the links between what we hope to get out of SWOT scientifically and what SWOT will be required to measure?
From SRR Executive Summary:
“The linkages related to baseline & threshold definitions, and minimum mission success criteria, should be clarified and made explicit.”

“The hydrology component of the SDT should be tasked to quantitatively define what the hydrology minimum mission success criteria should be.”
Status of Hydrology post-SRR

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Questions to Address:
1. What would constitute a successful mission in terms of hydrologic science?
2. How do we link the success criteria to quantifiable SWOT measurement capabilities?
Goals for Hydrology (I)

Demonstrate current understanding of how (and how well) SWOT will address science questions.

Rivers

Lakes

Mike Durand

Jean-Francois Cretaux
Goals for Hydrology (II)

Identify areas requiring additional study

For example:

- How different are assessments of continental-scale water balance at scales of 10,000 km$^2$ from assessments at scales of 50,000 km$^2$ or more? Is there a major difference in terms of science returns?

- What proportion of the change in water storage must be measured to characterize a region? With what precision do we need to measure change in water storage in regions with different hydrologic characteristics (e.g. lake size)?

- At what length scales do we need to measure river height, slope, and width to achieve science goals? Are 10 km reaches necessary? 100 km? 1 km?
Goals for Hydrology (III)

Reassess how we obtain the necessary understanding

Strategies:
- Existing literature
- New studies based on models and existing sensors
- AirSWOT
- SWOT simulator

We need to move beyond the philosophy of “we’ll take whatever we can get.”