A Hydrology Mission Design and Analysis System (H-MIDAS)

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H-MIDAS/ Sujay Kumar / NASA GSFC

- Future EO systems will encompass distributed sensor observations from complementary platforms (nano-satellites, air craft sensors, UAVs, ….).
- Simultaneous and adaptive integration of these heterogenous multi-sensor data is necessary for accurate monitoring and prediction of hydrological events and processes.
- Hydrological events are often driven by a cascading combination of meteorological extremes and antecedent land surface conditions
- Observing strategies founded in characterizing these process interdependencies are needed
- Modeling environments could provide information on the type, location, and frequency of the required measurements

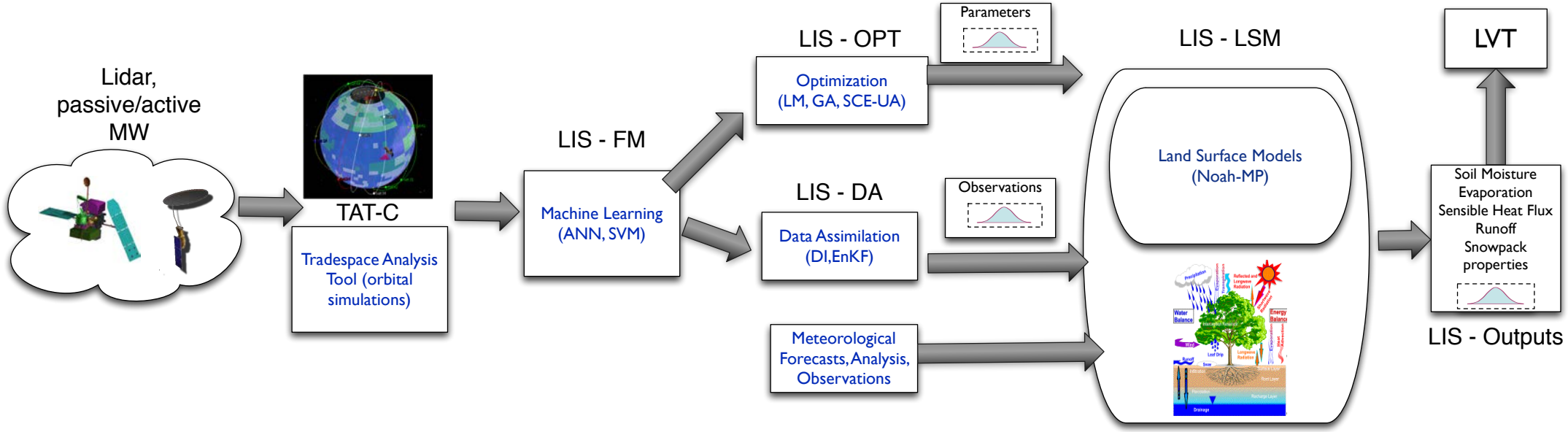
From McCabe et al. 2017

Project Objective

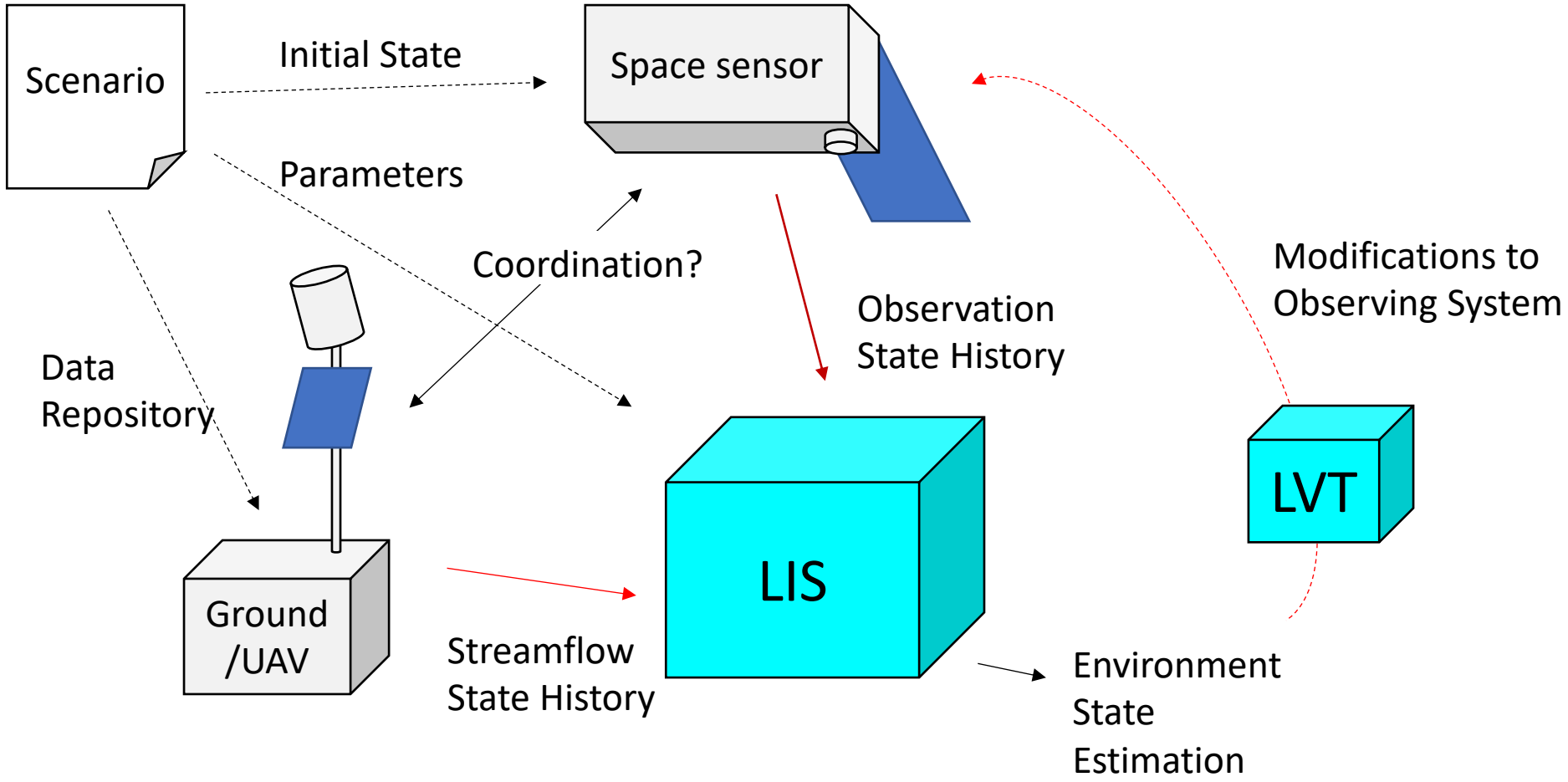
- Support the incorporation of distributed sensor observations for hydrology
  - Multiplatform, multi-angular sensor data
- Support the development of observation operators
  - Facilitate the science translation of raw measurements with relevant forward models (data driven or physical modeling-based)
- Data assimilation integrations
  - Support OSSEs that allow the incorporation of distributed sensor data
- Feedback to observing systems
  - Use OSSE assessments as feedback to observing systems

Project Technologies

- Modeling technologies: NASA LIS framework, which includes a formal tool for model skill assessments (LVT)
- Machine-learning tools for forward modeling



Project Relation to NOS Concept



Summary

- H-MIDAS targets the development of a science-driven environments that facilitates new observing strategies
  - Rapid science translation of raw measurements
  - Enable flexible, adaptive measurements driven by modeling systems
  - Enable interoperable data interfaces, non-local data access and open data paradigms
  - Facilitate a framework for the characterization of observational knowledge gaps