Terrestrial Working Group Meeting, February 2-3, 2009

"The Community Surface Dynamics Modeling System (CSDMS) deals with the Earth's surface - the ever-changing, dynamic interface between lithosphere, hydrosphere, cryosphere, and atmosphere. We are a diverse community of experts promoting the modeling of earth surface processes by developing, supporting, and disseminating integrated software modules that predict the movement of fluids, and the flux (production, erosion, transport, and deposition) of sediment and solutes in landscapes and their sedimentary basins."

CSDMS is now in year 2
Terrestrial Working Group: >110 members, >10 countries

TERRESTRIAL WORKING GROUP GOALS
2008 Strategic Plan

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Year 2+ (2008/09+) goals:

- Evaluate the state-of the-art in understanding sediment-transport processes that fall within the terrestrial domain … identifying existing models, research needs, and areas where models (and perhaps also data and process understanding) are missing …

- Develop a set of criteria for proof-of-concept applications ...

- Identify potential proof-of-concept applications and data sets.

- Stimulate proposals from the community for projects that will address important science questions while completing steps necessary for realizing the overall goals of CSDMS … encourage proposals for integration of at least two different landscape-scale models within the CSDMS framework … comparison of models within a unified framework should analyze and explicate different model predictions in the context of existing data sets.

- Create a prioritized list of computational infrastructure needs as relates to terrestrial process modeling and interface with coastal and marine environments ...

- Stimulate the beginnings of self-organizing collaborative teams …

- Define and prioritize educational needs training in … CSDMS framework.

Objectives of this meeting:

- Bring group up to speed on CSDMS activities and recent developments at the Integration Facility

- Make progress toward goals set in year 1

- Generate material for report and potentially publishable paper(s)

- Identify follow-up tasks for coming year

Agenda

- **4.2 Terrestrial Dynamics**
- **Year 2+ (2008/09+) goals**
- Evaluate the state-of the-art in understanding sediment-transport processes that fall within the terrestrial domain (e.g., hillslopes, river networks, glaciers, etc.). This includes identifying existing models, research needs, and areas where models (and perhaps also data and process understanding) are missing. This inventory provides the community with a basic map of the current state-of-the-art regarding both process knowledge and modeling capability.
- Develop a set of criteria for proof-of-concept applications. Among these criteria are the integration between at least two different components of the surface dynamics system, and well constrained boundary conditions. To the extent that such coupling is not seen as feasible in the short to medium term, then these criteria should address the barriers to that feasibility.
- Identify potential proof-of-concept applications and data sets.
- Stimulate proposals from the community for projects that will address important science questions while completing steps necessary for realizing the overall goals of CSDMS, for example by (1) developing / improving software for CSDMS, (2) developing proof-ofconcept modeling applications, (3) developing data sets for potential proof-of-concept applications, and/or (4) developing strategies to test model predictions. In particular, encourage proposals for integration of at least two different landscape-scale models within the CSDMS framework. These models need not necessarily link across domains; at this stage it is most important that a comparison of models within a unified framework should analyze and explicate different model predictions in the context of existing data sets.
- Create a prioritized list of computational infrastructure needs as relates to terrestrial process modeling and interface with coastal and marine environments. This will include working closely with the Cyberinfrastructure and Numerics Working Group to develop interfaces and basic components.
- Stimulate the beginnings of self-organizing collaborative teams, many of which include partners in the marine, coastal, cyberinfrastructure, and/or EKT realms.
- Define and prioritize educational needs training in the use of the CSDMS framework.
- **Year 3+ (2009/10+) Intermediate-Term Goals (2-4 years)**
- • Enhance the CSDMS library to include a healthy inventory of computer models and related
- tools that encapsulate our best present knowledge and ideas about terrestrial weathering,
- erosion, transport, and deposition, as well as related hydrologic and ecologic processes. The
- collection should include different sub-systems (large alluvial rivers, drainage basins, sand
- dunes, glaciers, etc.), different landform scales (e.g., single soil profiles, hillslope profiles,
- small catchments, sub-continental regions), different time scales (e.g., agricultural soil
- erosion, mountain growth and erosion), different domains (e.g., surface-water hydrology,
- landform evolution, chemical weathering, vegetation dynamics), and different ideas (e.g.,