By-Laws of the Community Surface Dynamics Modeling System (Amended May 22nd, 2020)

PREAMBLE

The Community Surface Dynamics Modeling System (CSDMS) assumes responsibilities to develop, support, and disseminate to the earth-science research and teaching community integrated software modules that are aimed at predicting the erosion, transport, and deposition of sediment and solutes in landscapes, seascapes and their repository sedimentary basins. The goal of CSDMS is to enable the rapid development and application of linked dynamical models tailored to specific landscape-basin evolution problems. These models should address time scales that range from years to thousands of years or longer, and spatial scales that include global, regional and local aspects of the earth's surface - from the mountain tops covered in glaciers to the deep seafloor and their sediments. To foster longer-term progress in surface modeling, CSDMS gathers and makes available models designed to elucidate poorly understood aspects of landscape, seascape, human and ecosystem dynamics. CSDMS develops and maintains a high-level of community participation to ensure:

a) Well-documented and user-friendly earth-surface dynamics software that keeps pace with both hardware and scientific developments;

b) Partnerships with related computational and scientific programs in order to eliminate duplication of effort, leverage mutual progress, and provide and benefit from an intellectually stimulating environment;

c) Appropriate training for both the users and teaching communities;

d) Hardware and personnel resources to support and facilitate software development and its use by the community;

e) Strong linkage between what is predicted by CSDMS codes and what is observed both in nature and in physical experiments.

CSDMS develops and maintains the computational system to ensure the portability and interoperability of modules, the computational efficiency of system code, and the clarity and consistency of documentation. CSDMS offers pedagogically evaluated earth-surface numerical technology to enhance and inform education in undergraduate to graduate programs, and science museums.

CSDMS Members adopt these By-Laws of the Community Surface Dynamics Modeling System for conducting CSDMS business in a collegial manner. These By-Laws do not override the standard responsibilities and prerogatives of the Principal Investigator and his/her institution.

ARTICLE I. NAME

Section 1. Name: The name of the Organization is *Community Surface Dynamics Modeling System (CSDMS)*.

ARTICLE II. MEMBERSHIP

Section 1. CSDMS Membership

A) Eligibility for Membership

CSDMS is an inclusive Earth sciences community with a purposefully broad body of members. Membership is open to US and foreign individuals. Members shall have demonstrated a major commitment to research in Earth System Science with a particular emphasis on computational earth-surface dynamics, and related fields (hydrology, fluvial processes, biogeochemistry, sedimentology, stratigraphy, geomorphology, glaciology, oceanography, marine geology, climate forcing, active tectonics, surface geophysics, remote sensing, geomathematics, computational fluid dynamics, computational science, environmental engineering, ecosystem science and human dimensions/social science). Although the majority of CSDMS members currently hold academic or research appointments, CSDMS encourages members from all career stages (undergraduate to late career), academic, government and industrial/commercial domains. Applicants may apply to the CSDMS Integration Facility to join one or more of the CSDMS Working and Focus Research Groups. The CSDMS Integration Facility shall maintain a list of Members and their Institutions.

B) **Voting Privileges**

i) Voting Privileges of Members to Elect Chairs of Working Groups

Official voting privileges are reserved for Working Group (as described in Article III, Section 1) members who are from U.S. academic institutions, government agencies, non-profit organizations, and industrial/commercial organizations. Working Group members from foreign academic institutions, not-for-profit organizations, foreign government labs, and consulting and industrial companies, are offered all of the privileges of U.S. members, except for the privilege of voting for the Chairs of the Working Groups that reside on the governing body of CSDMS — the CSDMS Executive Committee.

ii) Voting Privileges for Executive Committee Actions

Official voting privileges for motions of the Executive Committee are reserved for Chairs and Co-chairs of the CSDMS Working and Focus Research Groups. Each Working and Focus Research Group will have one vote regardless of the number of Co-Chairs in the group.

C) Resignation and Removal

Any member may resign by filing a written notice to the CSDMS Executive Director or the Director's designee. Such resignation shall take effect at the time of receipt of the notice, or later as specified therein. Given sufficient cause, a member can have their membership terminated by an affirmative vote of 2/3rds of the voting members of the CSDMS Executive Committee.

ARTICLE III. CSDMS GROUPS, INITIATIVES AND OTHER COMMITTEES

Section 1. Working Groups

A) Working Groups Defined

The six Working Groups (WGs) that support the CSDMS program include three (3) Environmental Working Groups and two (2) Integrative Working Groups, and one Interagency Committee.

The three key Environmental Working Groups are:

i) Terrestrial WG: weathering, hillslope, fluvial, glacial, aeolian, lacustrial;
ii) Coastal WG: delta, estuary, bays and lagoons, nearshore;
iii) Marine WG: shelf, carbonate, slope, deep marine.

The Integrative Working Groups are:

iv) Education and Knowledge Transfer (EKT) WG: includes marketing to gain end-users, workshops to provide training for end-users, web-based access to simple models (e.g. K- 12 teaching), access to archives of simulations. This WG will interact closely with its Partner Committees (Industry, Agency), field programs, and cyberinformatic partners.

v) Cyber-Infrastructure and Numerics WG: includes technical computational aspects of the CSDMS, ensures that the modeling system properly functions and is accessible to users; software protocols are maintained, along with model standardization and visualization.

The Interagency Committee:

vi) A CSDMS Interagency WG has the focus of fostering linkages between the main US environmental agencies that have interest in CSDMS products, standards, and approaches.

B) Working Group Chairs

Each Working Group will be led by one or two Chairs that have expertise in the working group domain. Chairs of Working Groups are elected to serve a 3-year term by a simple majority vote of the Working Group membership. Elections are conducted in accordance with Article V, Sections 1 to 4. Working Group chairs are appointed members (with voting privileges) of the CSDMS Executive Committee and conferred the rights and responsibilities as outlined in Article IV Section 1.

C) Working Group Member Voting Privileges

For the purpose of the election of a Working Group Chair, each CSDMS WG member shall be entitled to one vote as specified in Article V, Section 3. All WG members will be offered a chance to vote, via the Internet (e.g. email, a CSDMS Web Wiki). All other voting will be through a majority of the Working Group members present at the time of the vote (e.g. Annual Meeting of the Working Group).

D) Establishment and/or dissolution of Working Groups

Working Groups may be established or discontinued by a majority vote of the Executive Committee.

Section 2. Focus Research Groups

E) Focus Research Groups Defined

The CSDMS Focus Research Groups (FRGs) were established in 2008 to cut across our Environmental Working Group structure and to serve a unique subset of our surface dynamics community, often with support of well-developed co-sponsoring organizations. The current FRGs include:

i. Hydrology FRG is cosponsored by CUAHSI, the Consortium of Universities for the Advancement of Hydrologic Science, Inc., and deals with aspects of the hydrological system that impact earth-surface dynamics;

ii. Carbonate & Biogenics FRG addresses the grand challenges for fundamental research on ancient and recent carbonate systems, reefs and other seafloor supporting environments, through creation of the next generation of numerical carbonate and other seafloor-based biological process models;

iii. Chesapeake FRG is a 'geographically-focused' effort co-sponsored by the Chesapeake Community Modeling Program, to develop a watershed-estuary model consisting of interchangeable modules including hydrodynamics, ecosystem dynamics, trophic exchanges, and watershed interactions;

iv. Critical Zone FRG is co-sponsored by NSF's Critical Zone Observatory (CZO) Program and the International Soil Modeling Consortium (ISMC)to represent Critical Zone data and model development within CSDMS;

v. Human Dimensions FRG is co-sponsored by the Future Earth Programme and their AIMES (Analysis, Integration and Modeling of the Earth System) project, and by CoMSES Net, the Network for Computational Modeling for SocioEcological Science, a scientific research coordination network to support and expand the development and use of computational modeling in the social and life sciences. The HD FRG engages to codify human and societal processes into models of a future Earth, including next-generation agent-based models, economic models, and models that quantify human influences (behavior and

decision making) that affect earth system responses;

vi. Geodynamics FRG is committed to better understanding and modeling the coupled geodynamic - geomorphic system through the development and innovation of numerical tools and relevant and challenging proof-of- concept questions.

vii. Ecosystem Dynamics FRG represents the ecological modeling community and is co-sponsored by the International Society for Ecological Modelling (ISEM). The FRG deals with ecosystem and ecological dynamics with an emphasis on interactions with landscape processes.

viii. Cryosphere FRG represents the polar and alpine modeling community. The Cryosphere FRG will be newly formed during CSDMS 3.0.

F) Focus Research Group Chairs

Each Focus Research Group will be led by one or two Chairs who are appointed by the co-sponsoring organizations of the group. FRG Chairs shall serve a term of 3 years renewable by consent of the group's sponsoring organization and the CSDMS Executive Director. FR group chairs are voting appointed members of the CSDMS Executive Committee and conferred the rights and responsibilities as outlined in Article IV Section 1A. Focus Research Group Chairs are responsible for liaising between the co-sponsoring organization and the CSDMS Executive Committee. Chairs of the FRGs report directly to the CSDMS Executive Director and, where applicable, to the Chair or Director of the co-sponsoring organization.

G) Focus Research Group Member Voting Privileges

Members do not vote on FRG Chairs. All other voting will be through a majority of the FRG members present at the time of the vote (e.g. Annual Meeting of the Focus Research Group).

H) Establishment and/or dissolution of Focus Research Groups

Focus Research Groups may be established or discontinued by agreement between the Executive Director and one or more FRG Chairs (with approval of their sponsoring organizations). The Executive Committee will be notified prior to making changes and will be given an opportunity to provide comments on additions/dissolutions.

Section 3. Initiatives, Science Teams and Special/Standing Committees

A) Initiatives

CSDMS Initiatives were established to encourage short-term, transdisciplinary research. The current Initiatives include:

i. Coastal Vulnerability (led by the Coastal WG)
ii. Continental Margins (led by the Marine WG)
iii. Artificial Intelligence and Machine Learning (led by the Cyber WG)
iv. Exploring Interoperability of Open Modeling Platforms

Initiatives may be established or discontinued by agreement between the Executive Director and one or more Group Chairs.

B) Special or Standing Committees

The Executive Committee may create such special or standing committees as may be deemed desirable, the members of which shall be appointed by the Executive Director from among the Membership, with the Membership approved by the Executive Committee. Each such committee shall have only the lawful powers specifically delegated to it by the Executive Committee.

Section 4. Responsibilities and Activities of the WGs, FRGs and Initiatives

- **Group Discussion:** Stay current in the processes and models associated with their disciplinary toolkit and identify gaps in knowledge and areas where numerical tools need to be developed. Set scientific modeling priorities for their discipline. Make recommendations for resource prioritization and facilitate the movement of these priorities up the hierarchy from technology group to steering committee.
- **Review Activities:** Ensure quality control for the algorithms and modules for their area of expertise (benchmarking and model testing).
- **Group Project:** Address a CSDMS proof-of-concept challenge as outlined within the latest/updated CSDMS Strategic Plan, as appropriate.
- **Individually and collectively:** Stimulate proposals and input from the community. Create and/or manage the various environmental process modules related to their discipline. Provide community continuity to meet long-term CSDMS objectives.
- **Meetings:** Groups and Initiatives will coordinate much of their activity via remote communication systems, but are encouraged to meet as resources and interests permit.
- **Reporting:** Groups and Initiatives will report annually on their progress.

ARTICLE IV. GOVERNANCE

Section 1. Executive Committee

A) **Executive Committee of CSDMS**

The Executive Committee (ExCom) comprises: a) Executive Director and Lead PI of the award as Chair, (non-voting, except to break a tied vote); b) Chair of the Steering Committee (voting); c) Chairs of the defined working and focus research groups. The members of ExCom (Working Group and Focus Research Group Chairs) shall serve 3-year terms and they shall be eligible for re-appointment (by election by group membership in the case of Working Group Chairs, and by appointment of the sponsoring organization in the case of Focus Research Group Chairs). Members of ExCom other than the chair of the

Steering Committee may not simultaneously serve on the Steering Committee.

B) **Powers of the Executive Committee of CSDMS:**

The ExCom is the primary decision-making body of the CSDMS and will meet twice a year to approve annual plans, the annual report including the management plan, budget, partner membership, and other day-to-day issues that arise in the running of the CSDMS. The Executive Committee will ensure that the objectives of the NSF award are met. The ExCom will develop the By-Laws and any Operational Procedures, to be co-approved by the Steering Committee. At all meetings of ExCom, the presence of a simple majority of its Voting members then in office shall constitute a quorum for the transaction of business. So long as they do not conflict with the responsibilities of the Lead Principal Investigator (the CSDMS Executive Director), power in the management of the affairs of the CSDMS Organization is vested in the CSDMS Executive Committee. To this end and without limitation of the foregoing or of its powers expressly conferred by these By-Laws, the CSDMS Executive Committee shall have power to authorize such actions on behalf of the Organization, make such rules or regulations for its management, and create additional offices or special committees. The Executive Committee shall have the power to fill vacancies in, and change the membership of, such committees as are constituted by it.

The CSDMS Executive Committee will co-share authority with the CSDMS Steering Committee to amend or repeal the By-Laws, or the adoption of new By-Laws.

C) **Executive Director**

The Executive Director, or in his/her absence, the Deputy Director, shall, when present, preside at all meetings of the Executive Committee and shall perform such other duties and exercise such other powers as shall from time to time be assigned by the Executive Committee. The Executive Director shall be an *ex officio* member of all CSDMS committees. The Director is the Chief Executive Officer of the Organization, and unless authority is given by the Executive Committee to other officers or agents to do so, he or she shall execute all contracts and agreements on behalf of the Organization. The Director shall be the Lead Principal Investigator on proposals that fund the core CSDMS Facility. It shall be his or her duty, insofar as the facilities and funds furnished to him or her by the Organization permit, to see that the purposes, orders and voting within the CSDMS Organization are carried out. The Director shall preside at CSDMS-wide town-hall meetings.

D) **Deputy Director**

The Deputy Director is appointed by the Executive Director and serves to advise and support the Executive Director. In the absence of the Executive Director, the Deputy Director shall temporarily have the powers to perform the duties of the Executive Director's office to maintain the day-to-day operations of the CSDMS Integration Facility, to preside over meetings and to perform other duties as necessary to maintain continuity

for the CSDMS members and sponsors. There is no term limit for this position.

E) **Chairperson of the Steering Committee**

The SC Chairperson when present shall preside at all meetings of the Steering Committee and perform such other duties and exercise such other powers as shall from time to time be assigned by the Executive Committee. The Chairperson of the Steering Committee shall be an ex officio member of all CSDMS committees. After the Chair's term is complete, they will be offered the honorary title of Past Chair and provided with travel funds, when available, to attend CSDMS meetings as appropriate to their interest and CSDMS need.

F) **Working and Focus Research Group Chairs**

Chairs of the working and focus research groups will be full voting members of the Executive Committee and will represent the following areas of surface dynamics expertise: Terrestrial, Coastal, Marine, Cyber and Education & Knowledge Transfer, Interagency, Hydrology, Geodynamics, Chesapeake, Critical Zone, Human Dimensions, Ecosystem Dynamics and carbonates/Biogenics. They will have the authority to call meetings of the group they are responsible for and to meet the collective long-term CSDMS objectives.

G) **Elections and Term of Office**

All voting members of the Executive Committee must stand for election (Working Groups) or be appointed by the groups sponsoring organization (Focus Research Groups). The Executive Director is elected to office by a 2/3rds majority vote of the Executive and Steering Committees. There is no term limit for the Executive Director. The Chairperson of the Steering Committee shall be elected by a virtual vote of the full CSDMS membership orchestrated and recorded by the CSDMS Program Coordinator, for a three-year term and shall be eligible for re-election. Chairs of the Working Groups shall be elected by the members of the respective working groups by simple majority vote, orchestrated and recorded by the CSDMS Program Coordinator, for a three-year term, and shall be eligible for re-election. Focus Research Group Chairs are appointed by the CEO of the sponsoring organization and the CSDMS Executive Director. Focus Research Group Chairs do not have term limits.

H) **Resignation**

Any Officer (Executive Director, Deputy Director, Steering Committee Chair and Working Group Chairs) may resign at any time by giving written notice to the Chairperson of the Steering Committee, or the CSDMS Executive Director. Such resignation shall take effect at the time of receipt of the notice, or later specified therein.

I) **Vacancies**

The Executive Director may fill any vacancy in any Office for the unexpired portion of the term of such office.

J) **Removal**

Any Officer (Executive Director, Deputy Director, Steering Committee Chair and Working Group Chairs) may be removed at any time with cause by a 2/3rds majority vote of the Executive Committee.

Section 2. Steering Committee

A) **Steering Committee**

In order to carry out and oversee CSDMS operations, a Steering Committee (SC) has been established. The Steering Committee comprises a minimum of seven (7) members selected by the ExCom to represent the spectrum of relevant Earth science and computational disciplines. The serving NSF program officer or his/her designate, and the Executive Director or his/her designate, will serve as *ex officio* members of the SC. During SC meetings, there may be occasions when these *ex officio* members would exclude themselves from discussions.

The SC members will serve 3-year terms and shall be eligible for re-appointed. The Steering Committee will meet once a year to assess the competing objectives and needs of the CSDMS; will comment/advise on the progress of CSDMS in terms of science (including the development of working groups and partner memberships), management, outreach, and education; and will comment on and advise on revisions to the 5-year strategic plan. The Steering Committee will provide a timely report to the Executive Director who is to respond within four weeks.

ARTICLE V. ELECTIONS

Section 1. Executive Committee

With the exception of the Executive Director, the CSDMS Membership in accordance with the procedures established in this Article will elect voting members of the Executive Committee (FRG Chairs are appointed by their respective sponsoring organizations).

Section 2. Nominations for the Executive Committee

In consultation with the Steering Committee Chair and the Working Group's co-Chairs, the Executive Director will nominate one candidate to stand for election for each working group chair position to be filled. The Group membership is encouraged to suggest nominees to the Executive Director.

Section 3. Election

Each CSDMS working group member is entitled to one vote. Working Group Chair elections shall be conducted electronically. The CSDMS Integration Facility must receive Electronic or Paper votes by the deadline specified in the ballot. The outcome of the election will be decided by a simple majority of the votes cast.

Section 4. Counting of Ballots

The Steering Committee Chair, or his/her designated representative shall count Ballots. The CSDMS Program Coordinator is currently the designated representative.

ARTICLE VI. OPEN MEETINGS

Section 1. Annual Meetings

An annual meeting of the members shall take place; the specific date, time and location of which will be designated by the chair. At the annual meeting the members shall receive reports on the activities of the association, vote on pertinent group business and determine the direction of the association for the coming year.

Section 2. Special Meetings

Special meetings may be called by the Steering Committee chair, the Executive Director or a simple majority of the Executive Committee. A petition signed by five percent (5%) of voting members may also call a special meeting.

Section 3. Notice of Meetings

Written notice of each meeting shall be given to each voting member not less than two months prior to the meeting.

Section 4. Action and voting without a Meeting

Any action or voting required or permitted to be taken by the CSDMS members or the Executive Committee, may be taken/made electronically or without a meeting if the CSDMS members, or the Executive Committee, consent in writing to authorizing the action. The written consents thereto shall be filed with the minutes of the proceedings of the CSDMS members or the Executive Committee.

ARTICLE VII. CSDMS INTEGRATION FACILITY STAFF, OPERATIONS AND REPORTING

Section 1. CSDMS IF Staff, Operations and Reporting

Daily operations, staffing and reporting will be conducted in accordance with the requirements of the primary NSF award supporting CSDMS, and the rules and policies of the University of Colorado, Boulder.

ARTICLE VIII. COMPENSATION

Section 1. Compensation

No Member shall be paid any compensation for serving on the CSDMS Executive Committee, Steering Committee, or other committees and Groups. Representatives may

be reimbursed for the actual expenses incurred in performing duties assigned to them, within limitations of the host institution's budget associated with the NSF award.

ARTICLE IX. AMENDMENTS TO THE BYLAWS

Section 1. Amendments to the Bylaws

All By-Laws of the Organization shall be subject to amendment or repeal and new By-Laws may be made by the affirmative vote of two-thirds of the Executive Committee and the Steering Committee.