

CSDMS Education Repository

Contents

- [1 CSDMS Education Repository](#)
 - ◆ [1.1 Model Animations](#)
 - ◆ [1.2 Modeling Labs](#)
 - ◆ [1.3 Modeling Lectures](#)
 - ◆ [1.4 Modeling Textbooks](#)
 - ◆ [1.5 Submit Teaching Material](#)

Model Animations

Model animations illustrate earth surface processes. The animations are split into several categories to keep the information more searchable, naturally some movies span different domains.

The categorie 'Environmental Conditions' deals with climate and oceanographic conditions, which are generally drivers of earth surface processes. The subsequent domains are split in: Terrestrial, Coastal, and Marine Processes.

Every animation has an associated fact-sheet with a short description of the animation.

- [Animations of Environmental Conditions](#)
- [Terrestrial animation gallery](#)
- [Coastal animation gallery](#)
- [Marine animation gallery](#)

Modeling Labs

CSDMS shares model executables and notes for exercises with students as integrated packages. Feel free to download the material for use in your own courses and please provide feedback or expand the material!

- **" Coastal Stratigraphy Numerical Experiments"**.

The exercise is intended for graduate level teaching. The zipped file contains an executable of a teaching model, BarSim, developed originally by Joep Storms. The archive contains notes for a 3-hour computer lab as well as the background literature. The exercise allows students hands-on experience with a simple stratigraphic model to get insight in setting up stratigraphic simulation experiments. Focus is on exploration of the effects of external forcing factors, i.e. sediment supply and sea-level, on wave-dominated coasts and barrier islands.

[zip archive with model and notes](#)

Modeling Lectures

- I. Overeem, 09/08: **"Geological Modeling"**.

These presentations are part of a course on Geological Modeling over medium to long time-scales, intended for graduate level teaching. Feel free to download the material for use in your own courses, but please acknowledge the authors. This course consists of 7 presentations that are titled:

- 1. Geological modeling introduction [PPT](#) or [PDF](#)
- 2. Modeling Long-term Basin-fill [PPT](#) or [PDF](#)
- 3. Climate-Hydrological modeling of Sediment Supply [PPT](#) or [PDF](#)
- 4. Deterministic and Stochastic Modeling [PPT](#) or [PDF](#)
- 5. River and Plume deposition and Ocean Reworking [PPT](#) or [PDF](#)
- 6. Marine Modeling Case-Study [PPT](#) or [PDF](#)
- 7. Uncertainty in Geologic Models [PPT](#) or [PDF](#)

- J. Syvitski, 08/09: **"Earth-Surface Dynamics Modeling"**.

These presentations are part of a course on Earth-surface Dynamics Modeling & Model Coupling, intended for graduate level courses on Earth Surface Processes. Feel free to download the material for use in your own courses, but please acknowledge the authors. This course consists of 7 presentations that are titled:

- 1. Process-response modeling principals [PPT](#) or [PDF](#)
- 2. Modeling Discharge and Sediment Flux [PPT](#) or [PDF](#)
- 3. Landscape Evolution Modeling [PPT](#) or [PDF](#)
- 4. Coastal Morphodynamics [PPT](#) or [PDF](#)
- 5. Marine (Shelf) Morphodynamics [PPT](#) or [PDF](#)
- 6. Density Currents, Sediment Failure & Gravity Flows [PPT](#) or [PDF](#)
- 7. Source to Sink Numerical Modeling Approaches [PPT](#) or [PDF](#)

Modeling Textbooks

CSDMS works with modelers in the community who have published textbooks on modeling. We keep the associated code in the model repository so that it is easy to get for faculty and students alike.

Quantitative Modeling of Earth Surface Processes, 2008, Jon D. Pelletier, University of Arizona, Cambridge Publishers.

The publisher claims: "This textbook describes some of the most effective and straightforward quantitative techniques for modeling Earth surface processes. By emphasizing a core set of equations and solution techniques, the book presents state-of-the-art models currently employed in Earth surface process research, as well as a set of simple but practical research tools. Detailed case studies demonstrate application of the methods to a wide variety of processes including hillslope, fluvial, aeolian, glacial, tectonic, and climatic systems. "

Simulating Clastic Sedimentary Basins/Physical Fundamentals and Computing Procedures, 1994, Slingerland, R.L., K. Furlong and J. Harbaugh, Prentice Hall, Englewood Cliffs, NJ:219 pp.

This textbook describes basic fundamental processes and shows how to simplify these processes into quantitative models. Processes reach over a range of scales and time domains; i.e. landscape evolution to bedload transport. FORTRAN routines accompany an overview of earth surface processes

We are presently working to make all routines available of Gary Parker's ebook as well (November 2009). [link to Parker'sEbook](#)

1D SEDIMENT TRANSPORT MORPHODYNAMICS with applications to RIVERS AND TURBIDITY CURRENTS, 2007, G. Parker, E-book

Submit Teaching Material

CSDMS welcomes submissions of teaching material, whether it be your coolest model animations, or material that you developed for undergraduate and graduate courses in earth surface processes. If you have images or animations they can be easily added to the respective wiki pages. For more comprehensive material, or material that needs some modifications to be served here, please contact CSDMS' Education and Knowledge Transfer Specialist. irina.overeem@colorado.edu

Information on this website is provided as a public service and is intended for educational and research purposes. Materials developed by CSDMS, its members, participants and partners, are the intellectual property of those respective individuals, who reserve all applicable rights to their respective intellectual property.

As an organization devoted to the creation, discovery, dissemination and sharing of knowledge and research, CSDMS holds a strong commitment to comply with all applicable laws regarding intellectual property.

Please note: It is not the intent of CSDMS to violate or infringe upon any copyrights. Our use is presumed to be appropriate and in accordance with "Fair Use" provisions. If any copyrighted material has been

inappropriately included on these pages, please inform us. Immediate action will be taken to rectify the situation, either by removing the materials or obtaining appropriate permission.

The University of Colorado at Boulder encourages the fair use of copyrighted materials in support of its academic and research mission, and strives to provide clear guidance to faculty, students, and staff who wish to use any materials that may be copyrighted in their teaching and research.

At the same time, the university is legally required to establish policy stating that faculty, staff, students, and community members must obey all state and federal laws respecting the copyrights and trademarks of others. Learn more at <http://www.colorado.edu/copyright>.