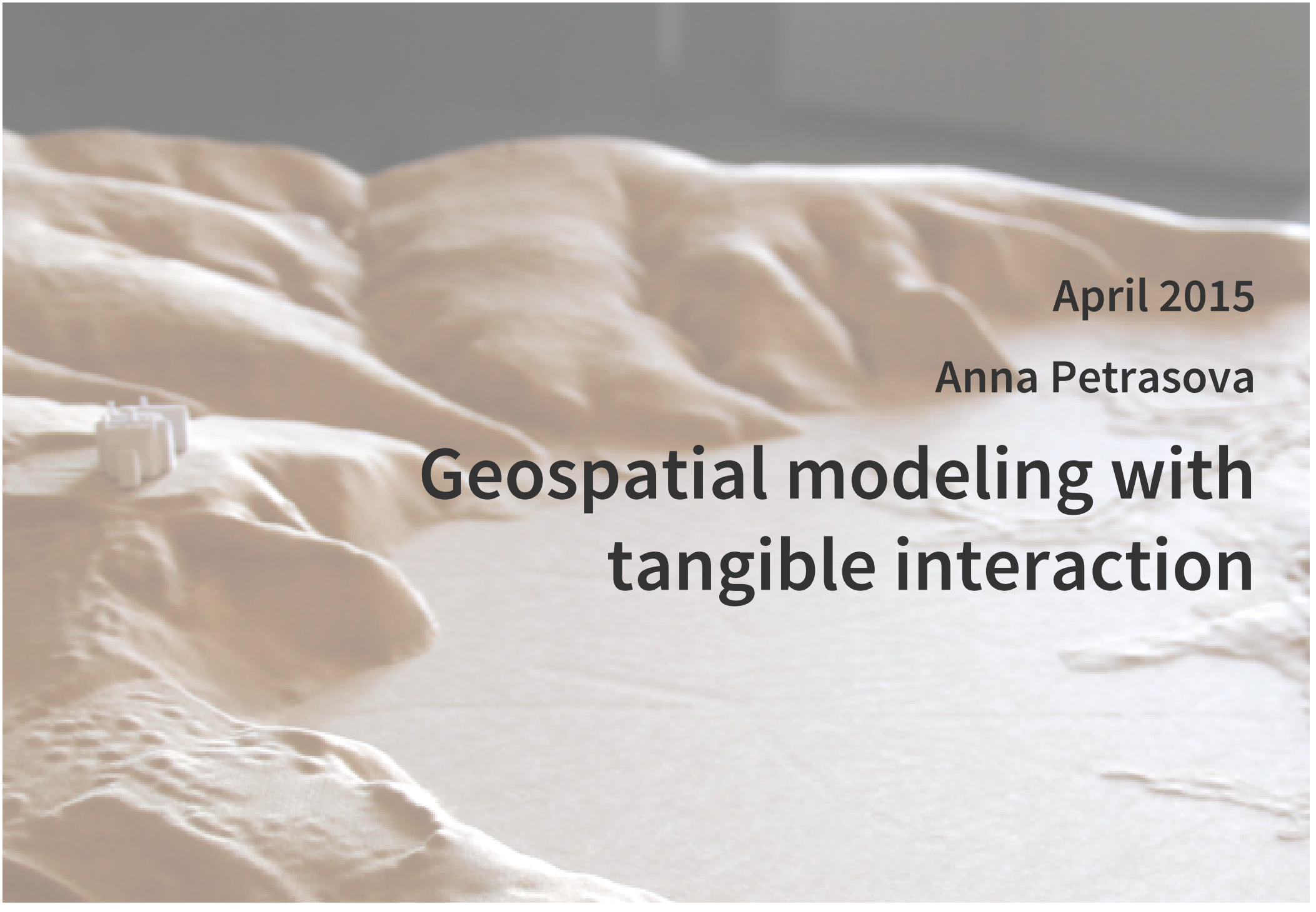


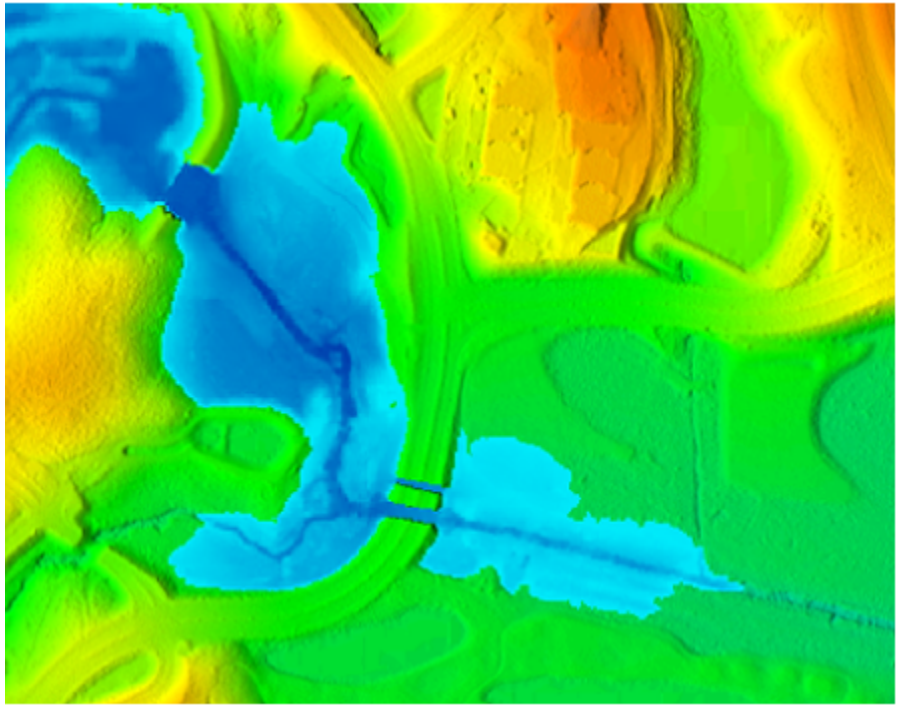
April 2015

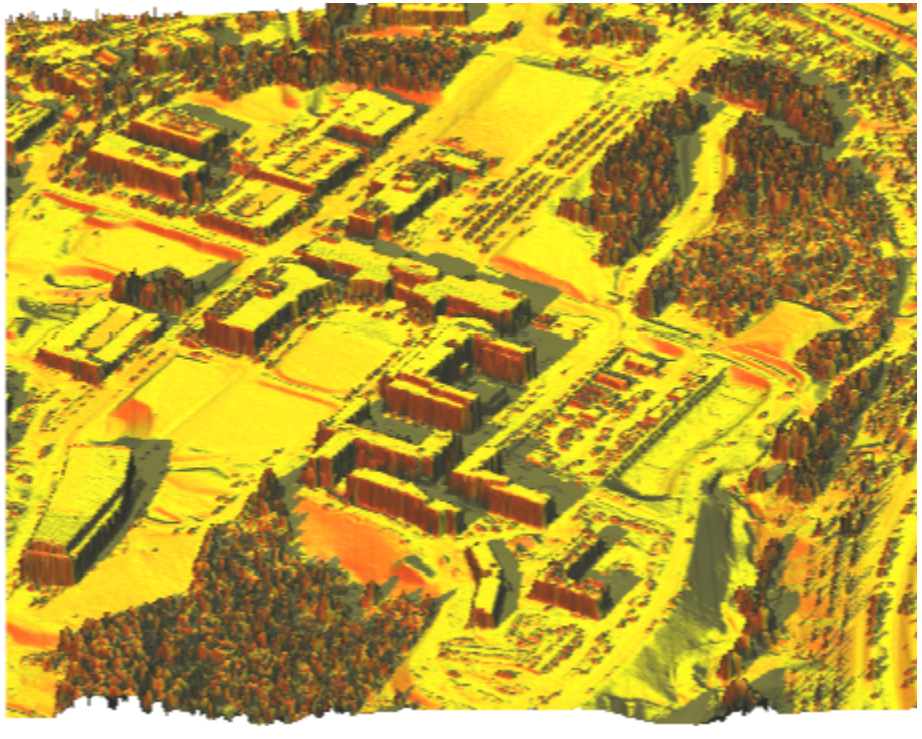
Anna Petrasova

Geospatial modeling with tangible interaction

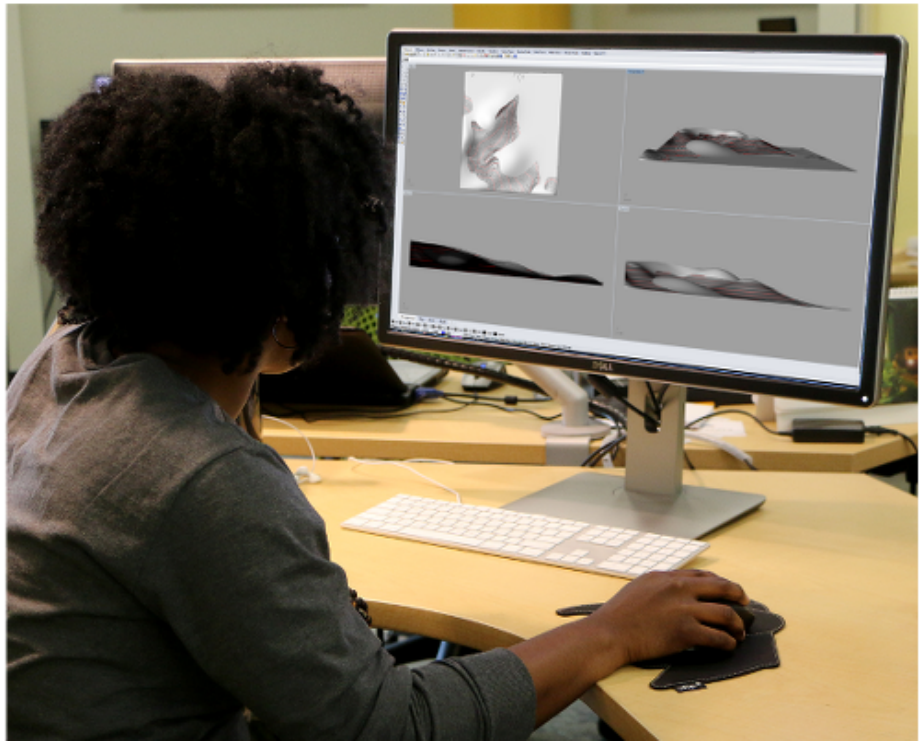
Topography as a driving force

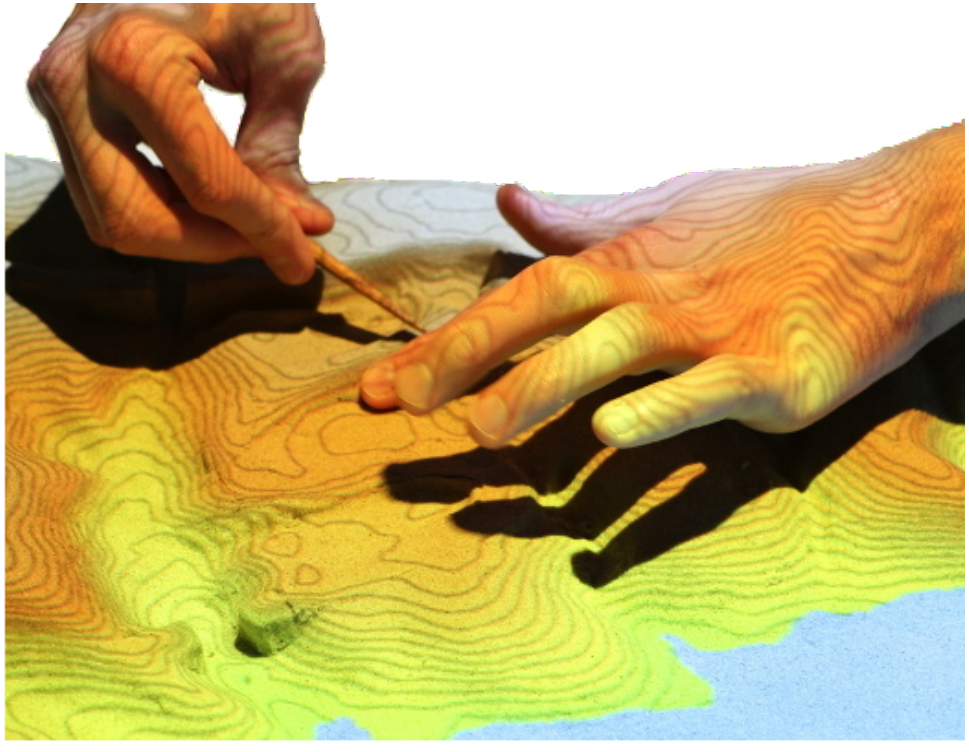
Topography controls water flow, sediment transport, inundation, landslides, and determines solar irradiation





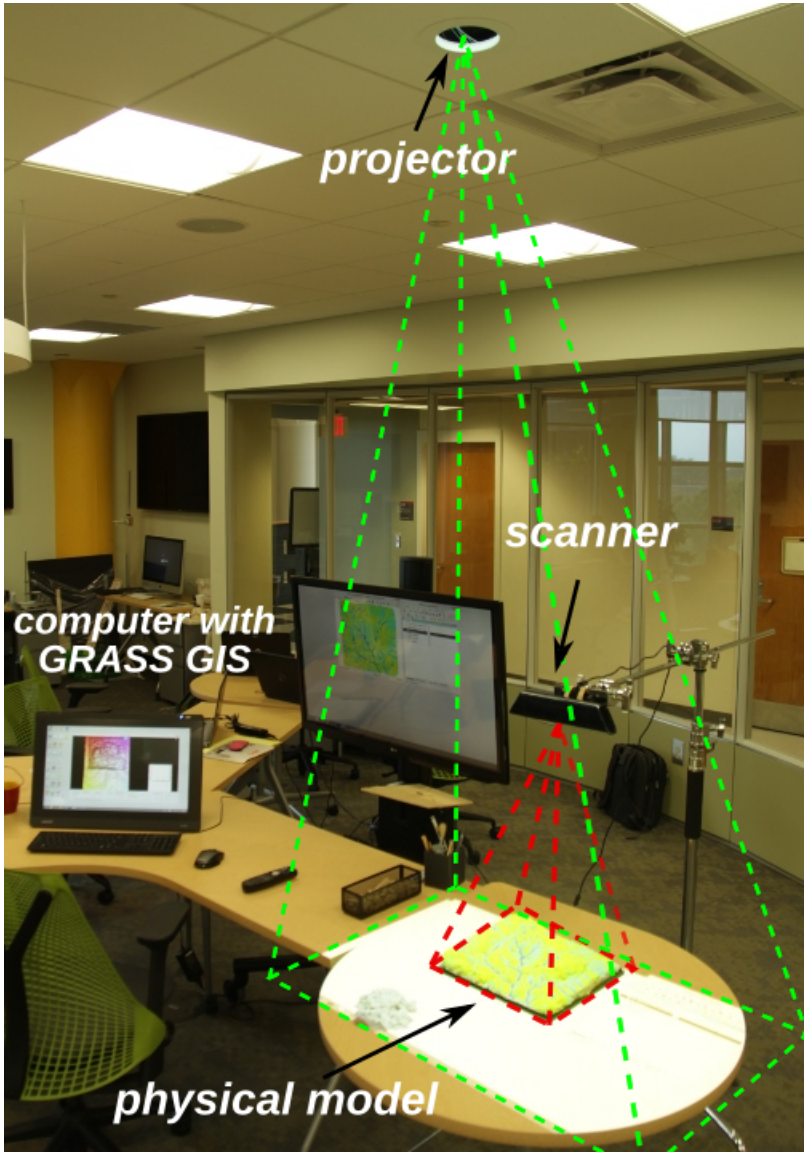
Terrain modification





GUI vs. TUI

Tangible Landscape



=

physical terrain model

+

scanner (Kinect)

+

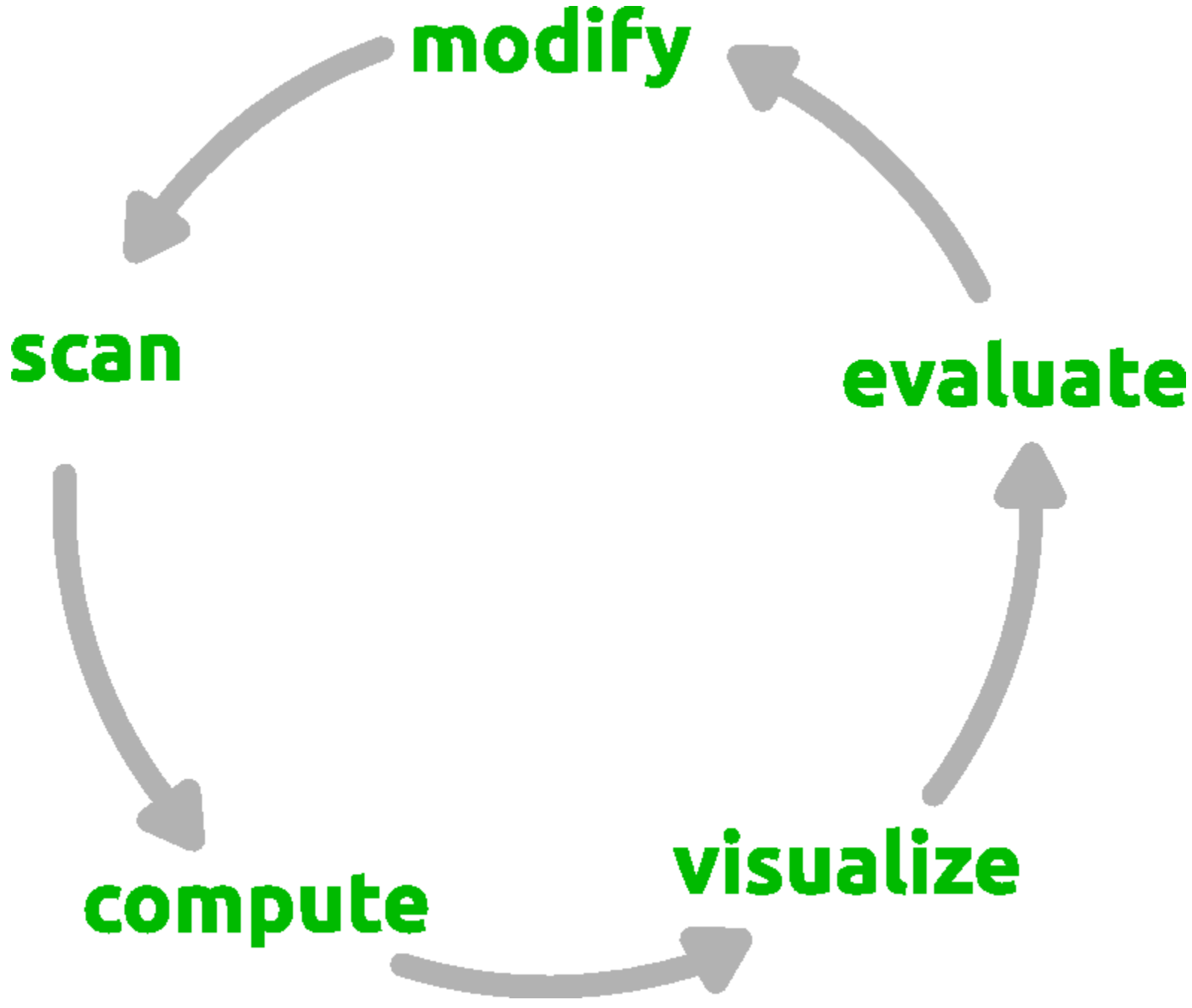
projector

+

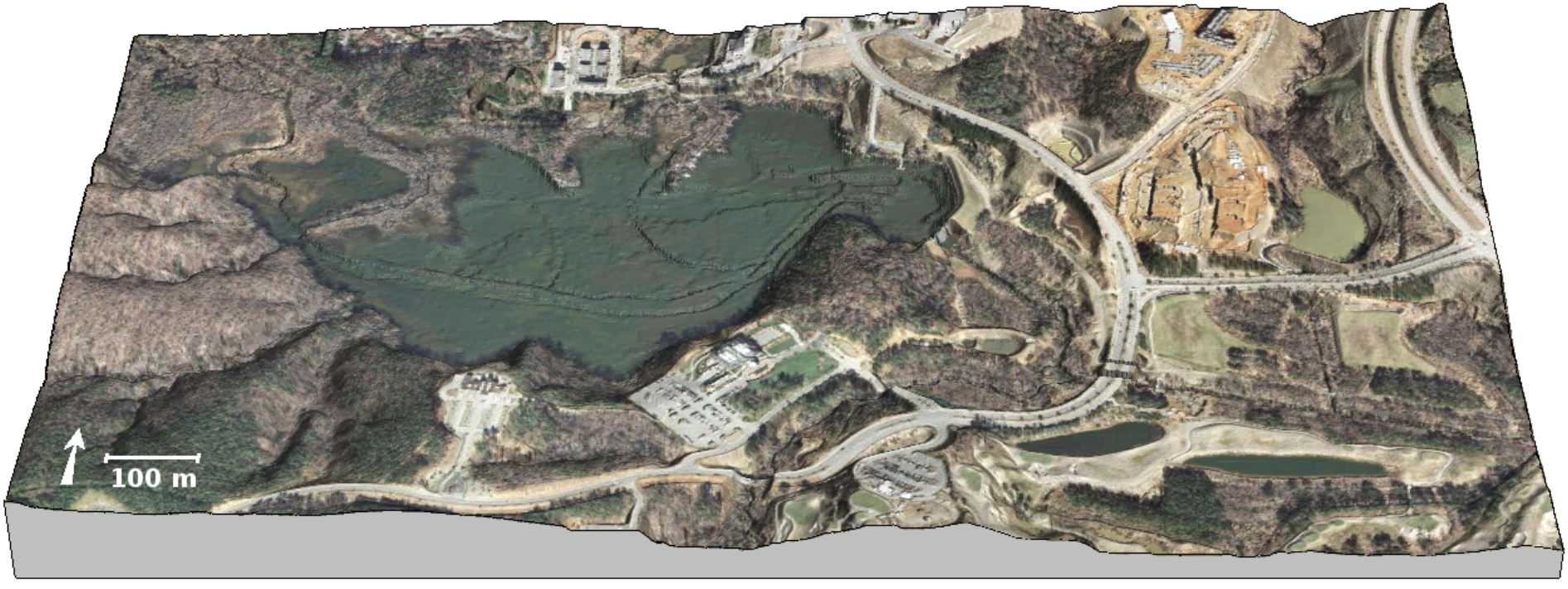
computer

+

GRASS GIS


modify
scan
evaluate
compute
visualize

Lake Raleigh dam break

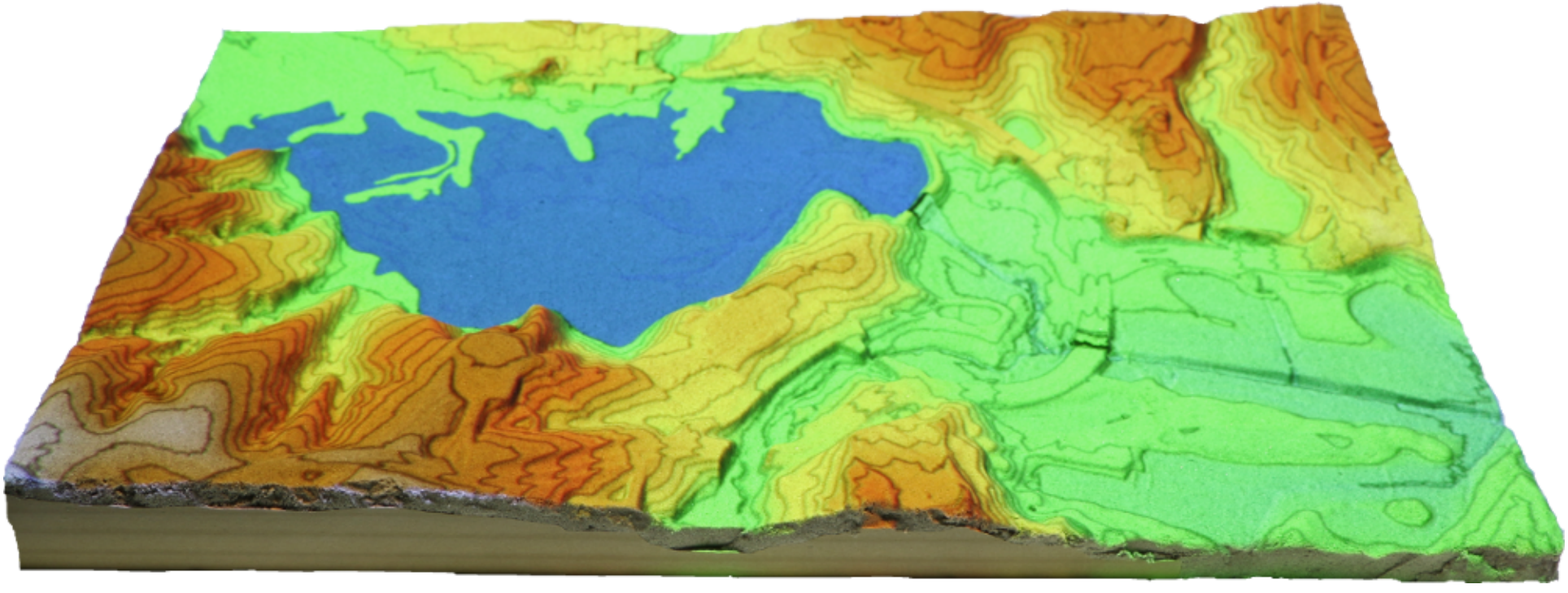


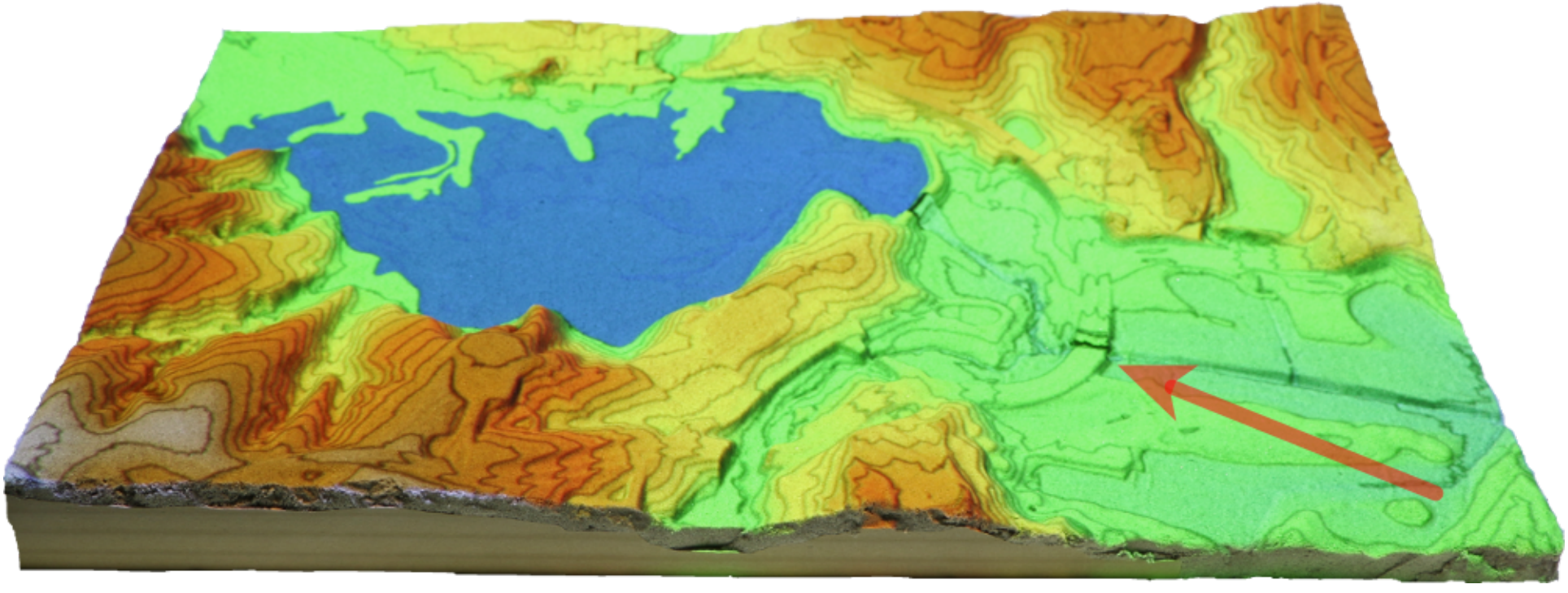
Lake Raleigh dam break

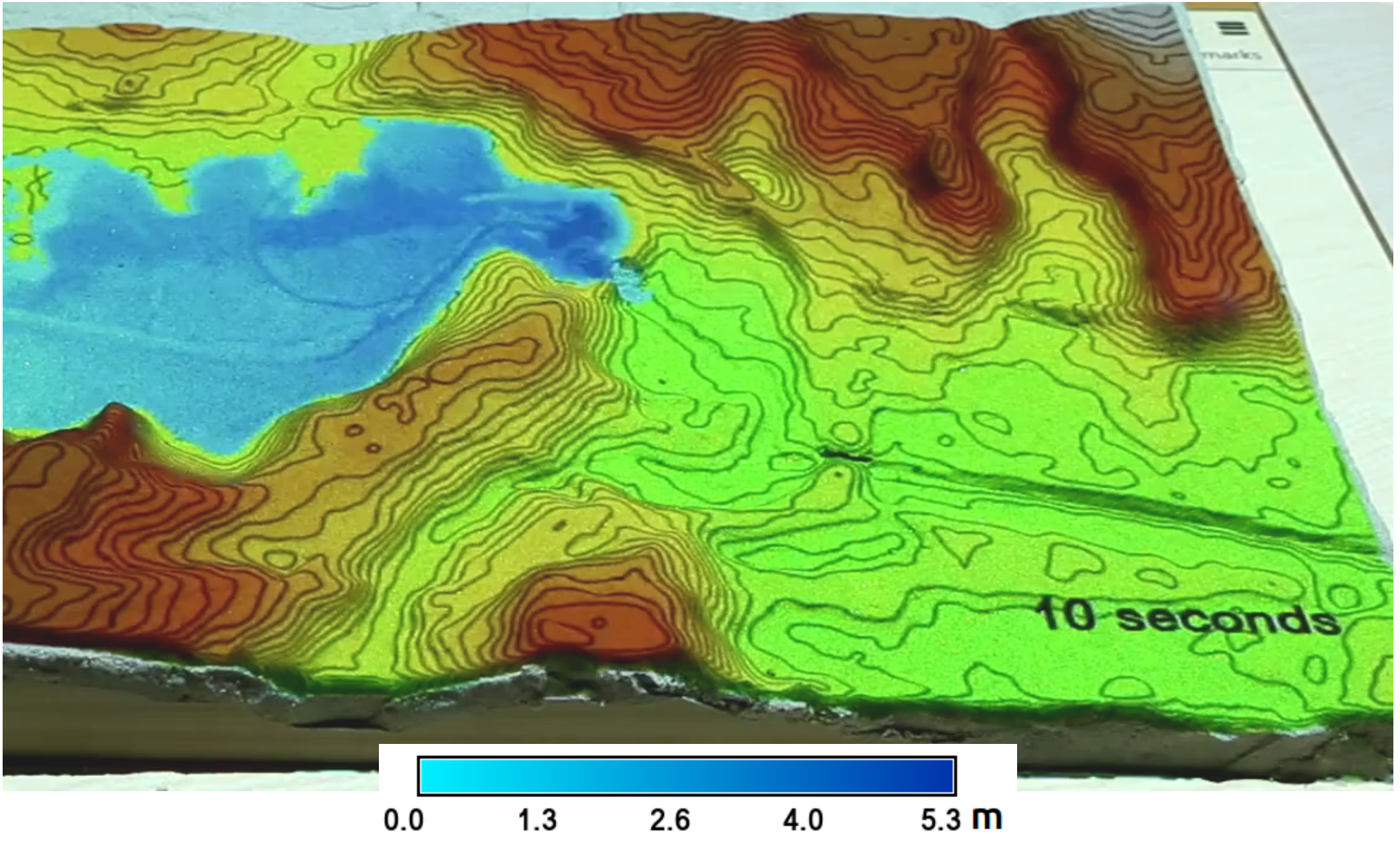

Source: NCSU Libraries

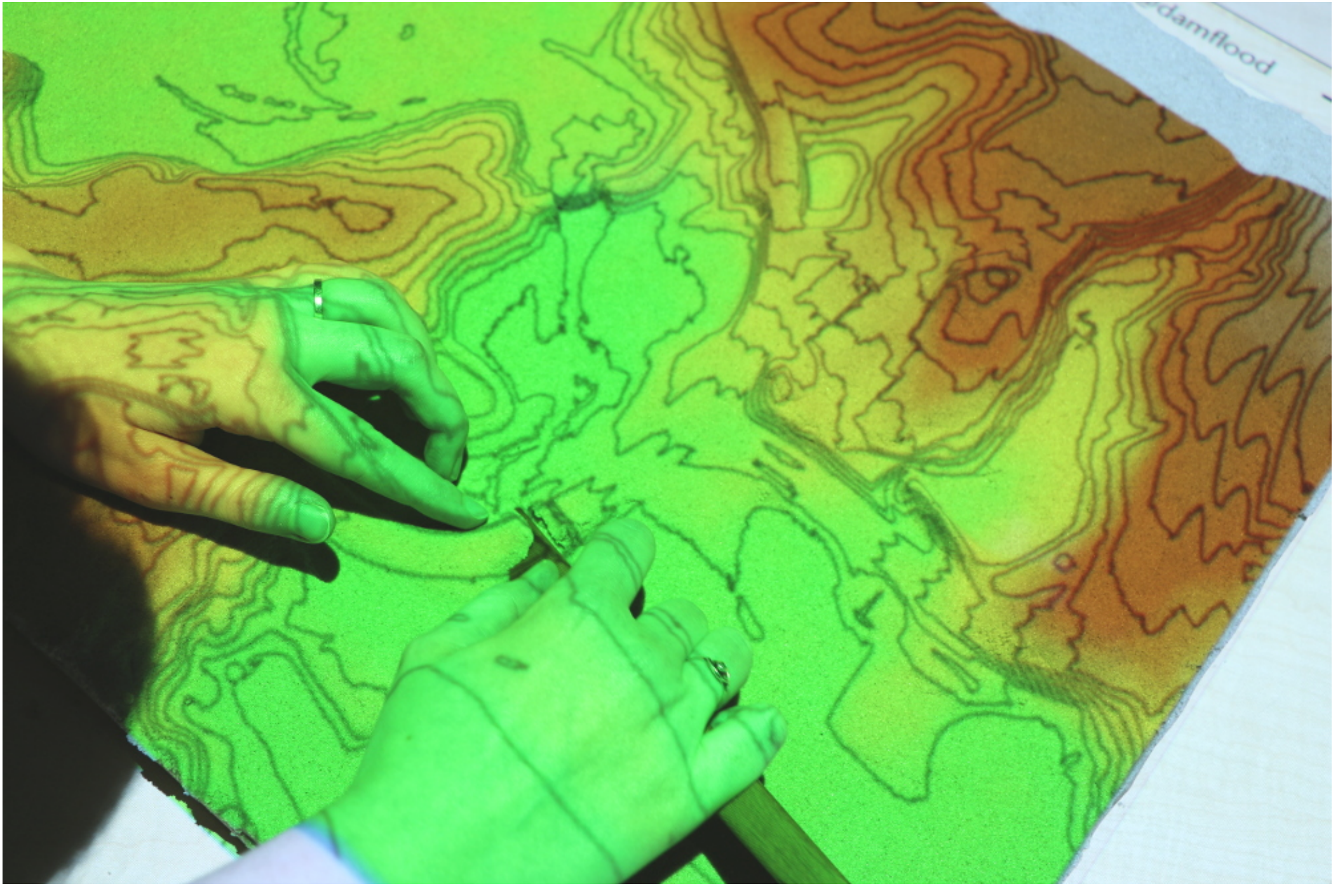
Simulation using module *r.damflood* implemented in GRASS GIS solving shallow water equations.

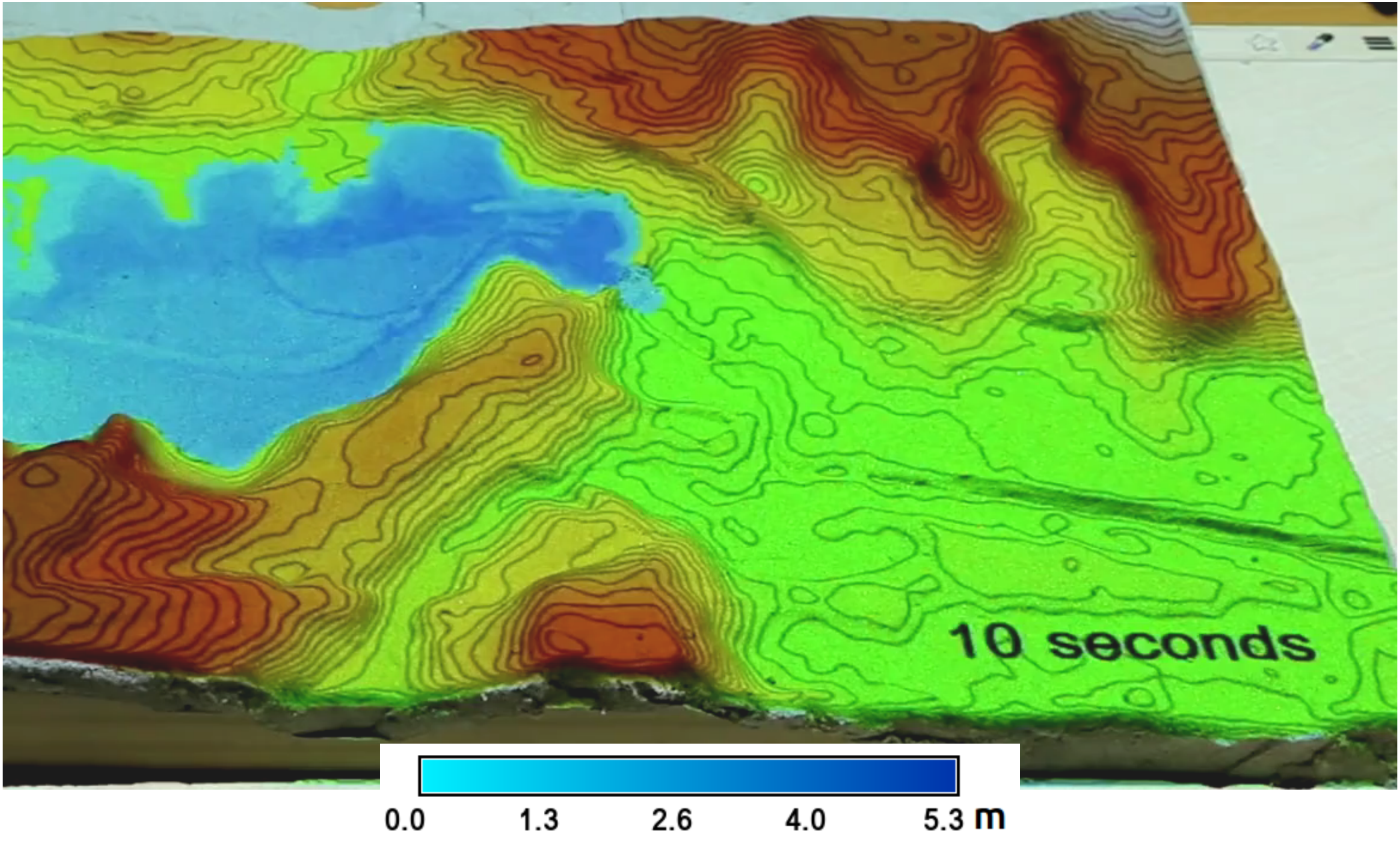
Cannata, M., & Marzocchi, R. (2012). Two-dimensional dam break flooding simulation: A GIS-embedded approach. Natural Hazards, 61(3), 1143–1159.

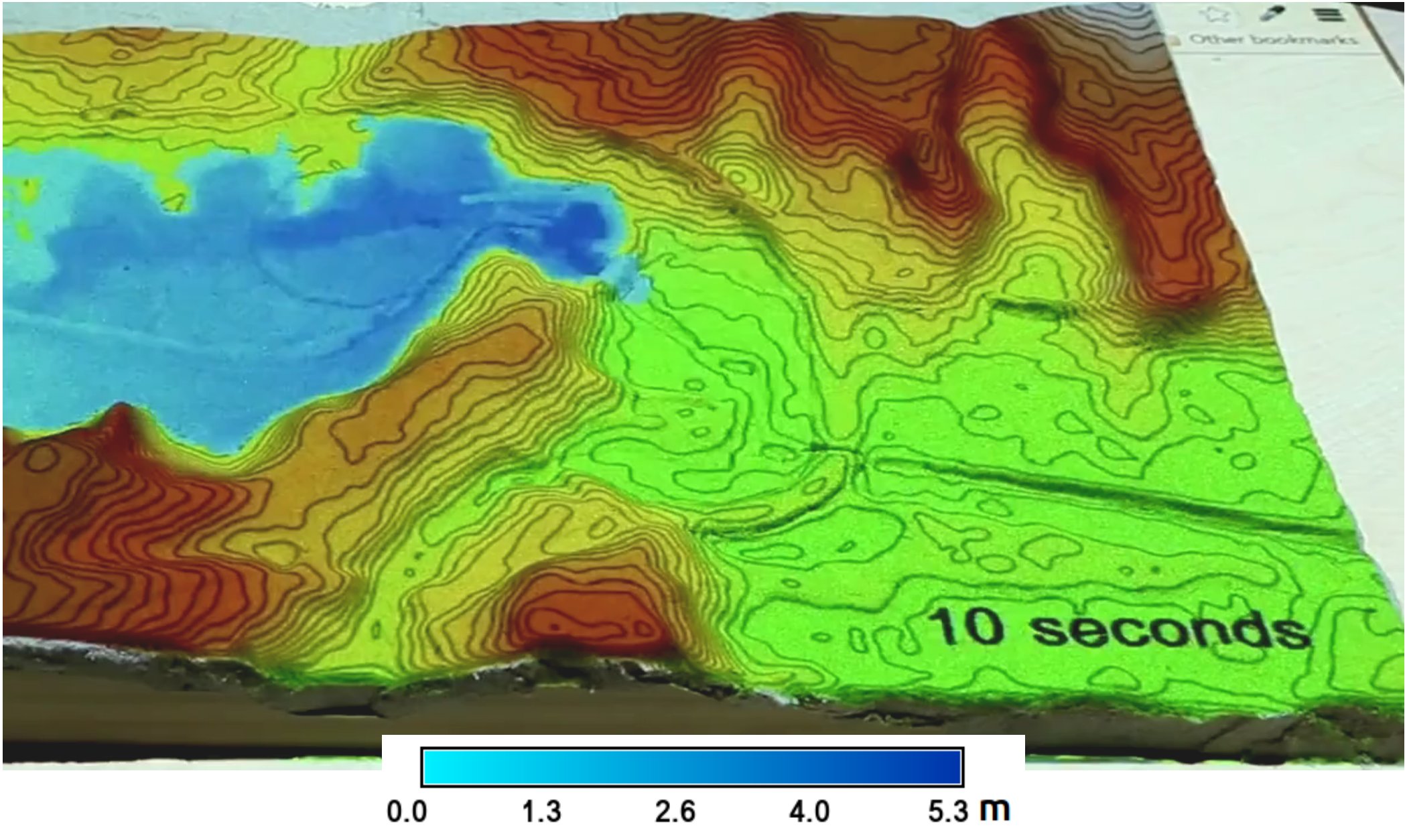




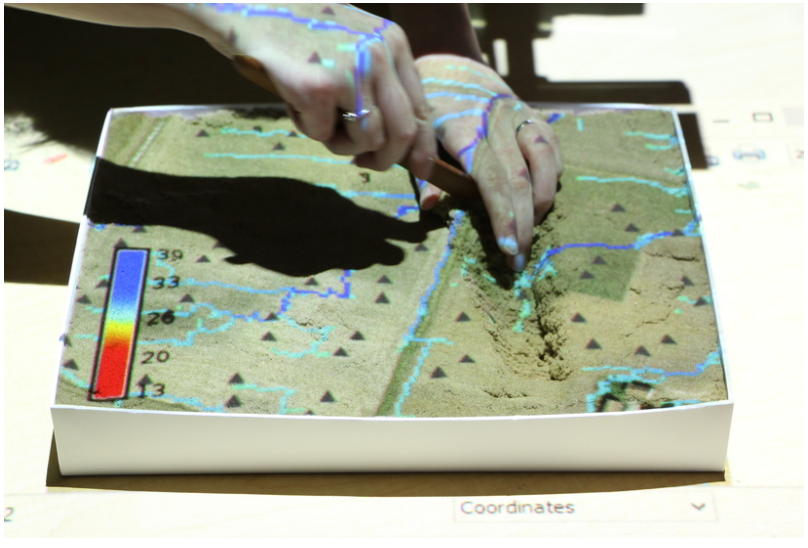

10 seconds
0.0
1.3
2.6
4.0
5.3 m

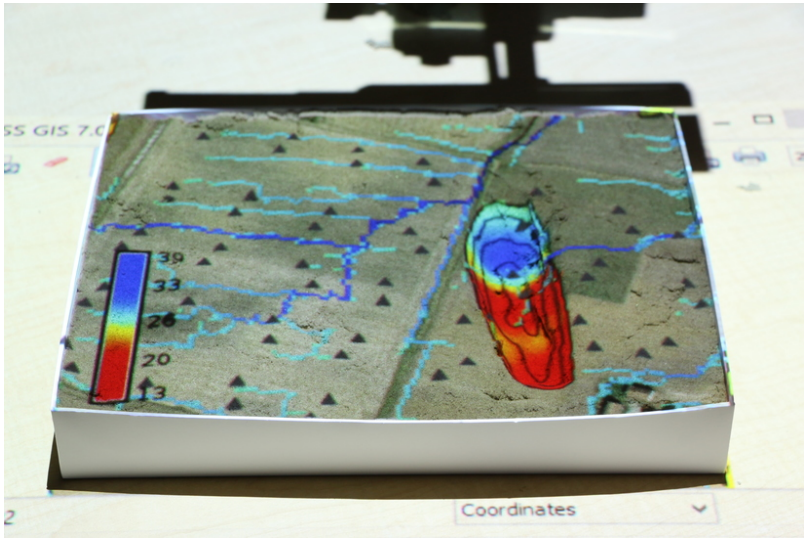

damflood

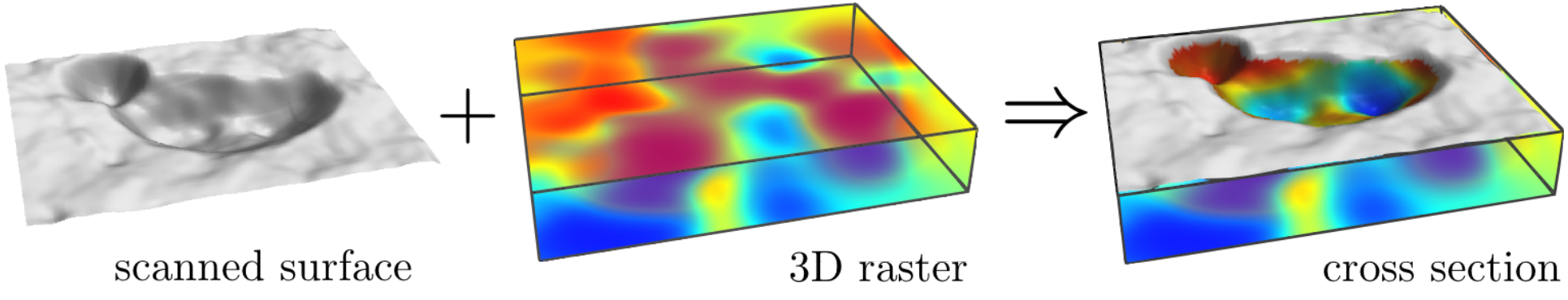

10 seconds
0.0
1.3
2.6
4.0
5.3 m

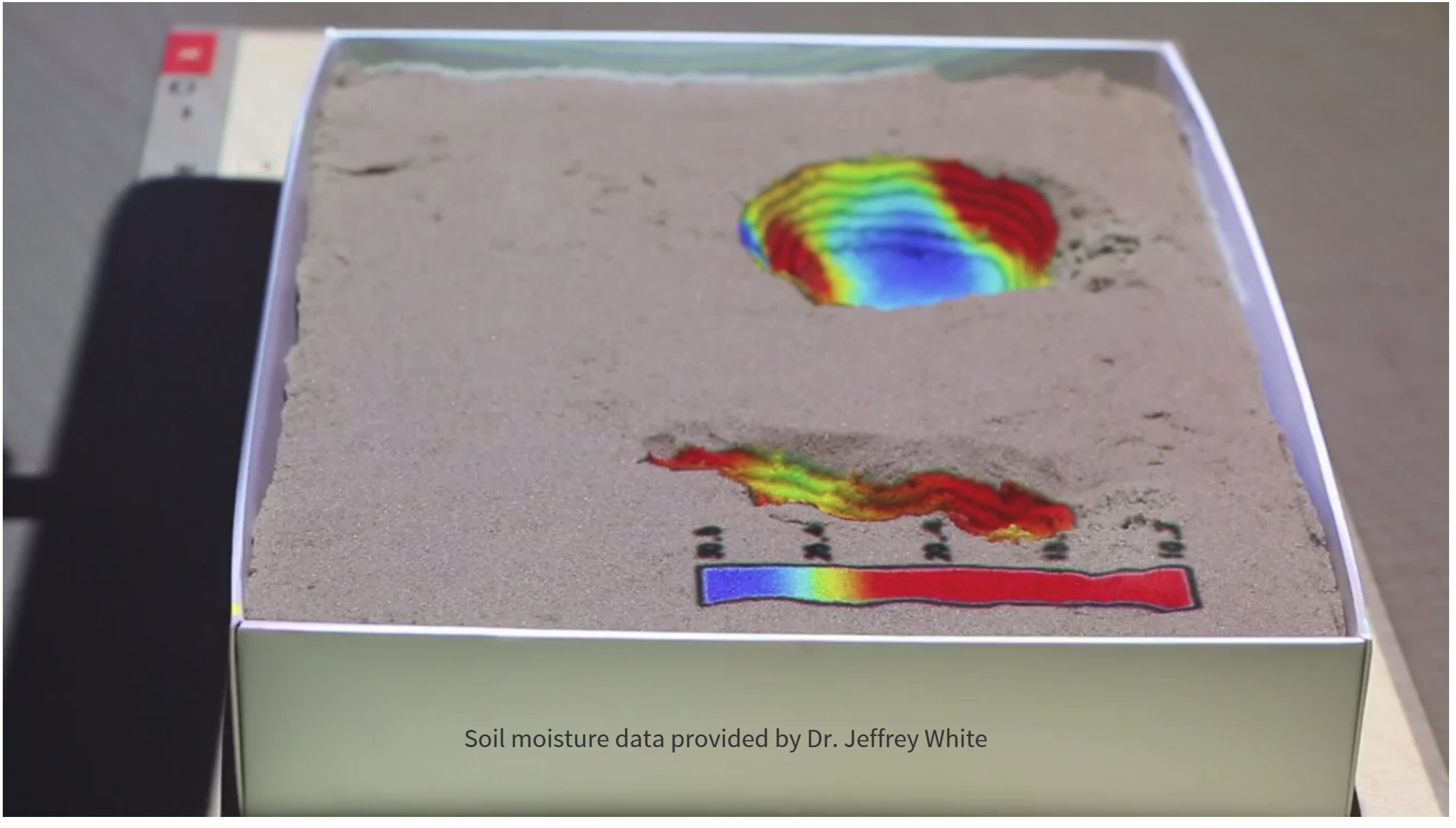

Other bookmarks
10 seconds
0.0
1.3
2.6
4.0
5.3 m

Tangible exploration of subsurface data






scanned surface
3D raster
cross section



Soil moisture data provided by Dr. Jeffrey White

Applications

- intuitive 3D sketching for design and planning
- collaborative, interdisciplinary and creative environment for decision making
- GIS education, explaining spatial concepts
- testing of algorithms for modeling land surface processes


THANK
YOU