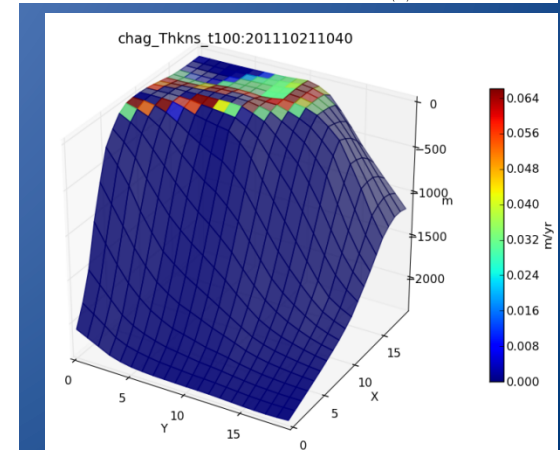
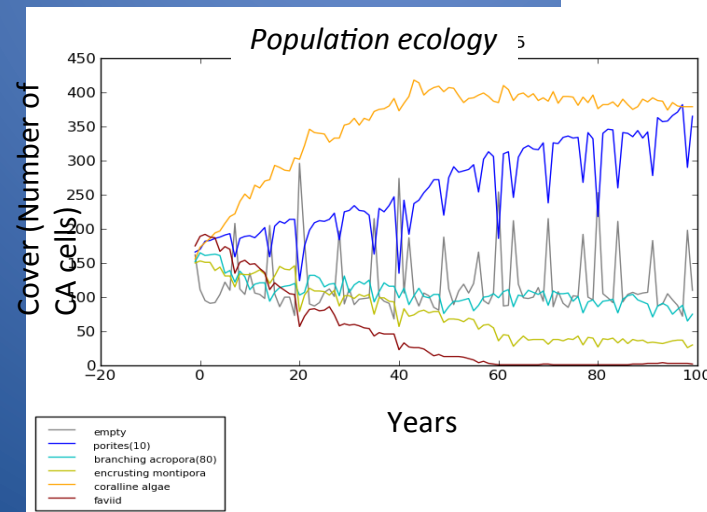
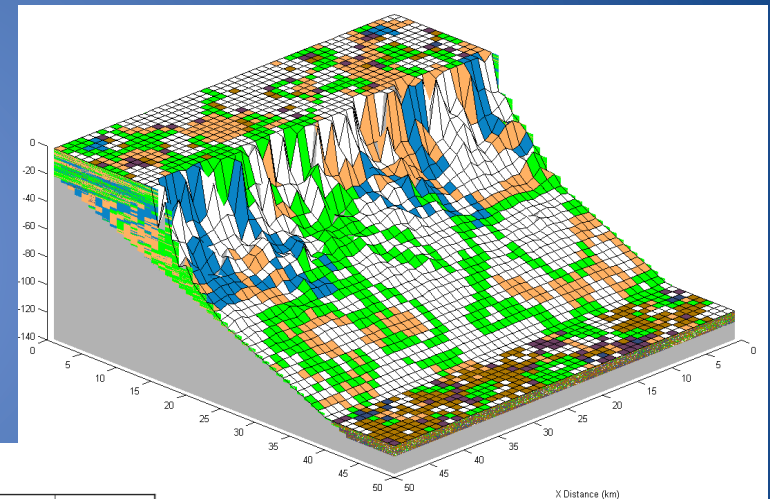


Carbonate FRG in CSDMS 2.0

Strategy from 2013 onwards

Carbonate FRG Progress To Date

- Initial 60+ group currently represented by **only a few members actively coding and compiling data** with some NSF support
- Multiple carbonate models developed since 2008
- Database of rates for carbonate systems being populated, and able to be interrogated by developing models

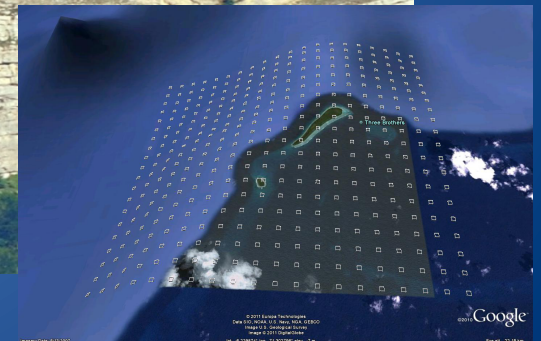


Carbonate FRG Long-Term Goals

- Original group vision from 2008 remains valid – develop componentized “workbench” of carbonate models and encourage non-modellers to use them as default tools
- Ultimate goals are understanding of carbonate rock heterogeneity and 100 year prediction of carbonate response to environmental change, both from a suite of new next-generation components that more properly represent complex carbonate biology and chemistry

- What is unique in our style

- Population dynamics
- Spatial organization, mosaics, statistics
- To-do trophics, water chemistry
- Knowledge base
- Real world runs



Carbonate FRG Long-Term Strategy:

Specific Steps:

1. Develop BMI “wrapped” coupled carbonate model components that do all that the currently separately developed carbonate models (e.g. CarboCAT, CarboLOT, CarboCELL) do
 - Represents an evolution of the original Carbonate Workbench concept from 2008-2009
 - Components will represent both short time scale (decadal+) and long time scale processes (100Ky+) to satisfy the range of potential users
 - Will make extensive use of existing elements of SedFlux for representation of deposition as accumulated strata and for sediment transport elements. Non-relevant parts of SedFlux will be turned off
2. Complete development and population of a carbonate knowledge base and integrate it with carbonate model components
 - Currently lots of diverse rate data in an Excel spreadsheet, being developed by Chris and Don
 - Attracting lots of community interest, but not yet shared more widely, nor able to be interrogated by any models
3. Re-engage the wider “fizzhead” FRG community (the other 60 members) and grow the community by offering the developed components as a focal point for testing, benchmarking, further development and use as educational tools

Carbonate Components

The screenshot displays the CSDMS Modeling Tool interface. The title bar reads "CSDMS Modeling Tool". The menu bar includes "File", "Edit", "View", "Tools", and "Help". Below the menu bar is a toolbar with icons for file operations and simulation controls. On the right side of the toolbar, there are radio buttons for "Wired" (selected) and "Wireless".

The "Remote Working Directory:" is set to "~/CMT_Output/". The "Working Project:" is "CEM + Avulsion + HydroTrend...". Below this, there are tabs for "Workspace", "Visualize", "Job Info", and "Help".

The main workspace is divided into two main sections: "Driver" and "Arena".

Driver Section:

- A dropdown menu shows "CEM" selected.
- A "Palette" on the left lists components: "Avulsion", "CEM", "ConstantRiver", "HydroTrend", "RiverReader", "Waves", and "ConstantScalar".

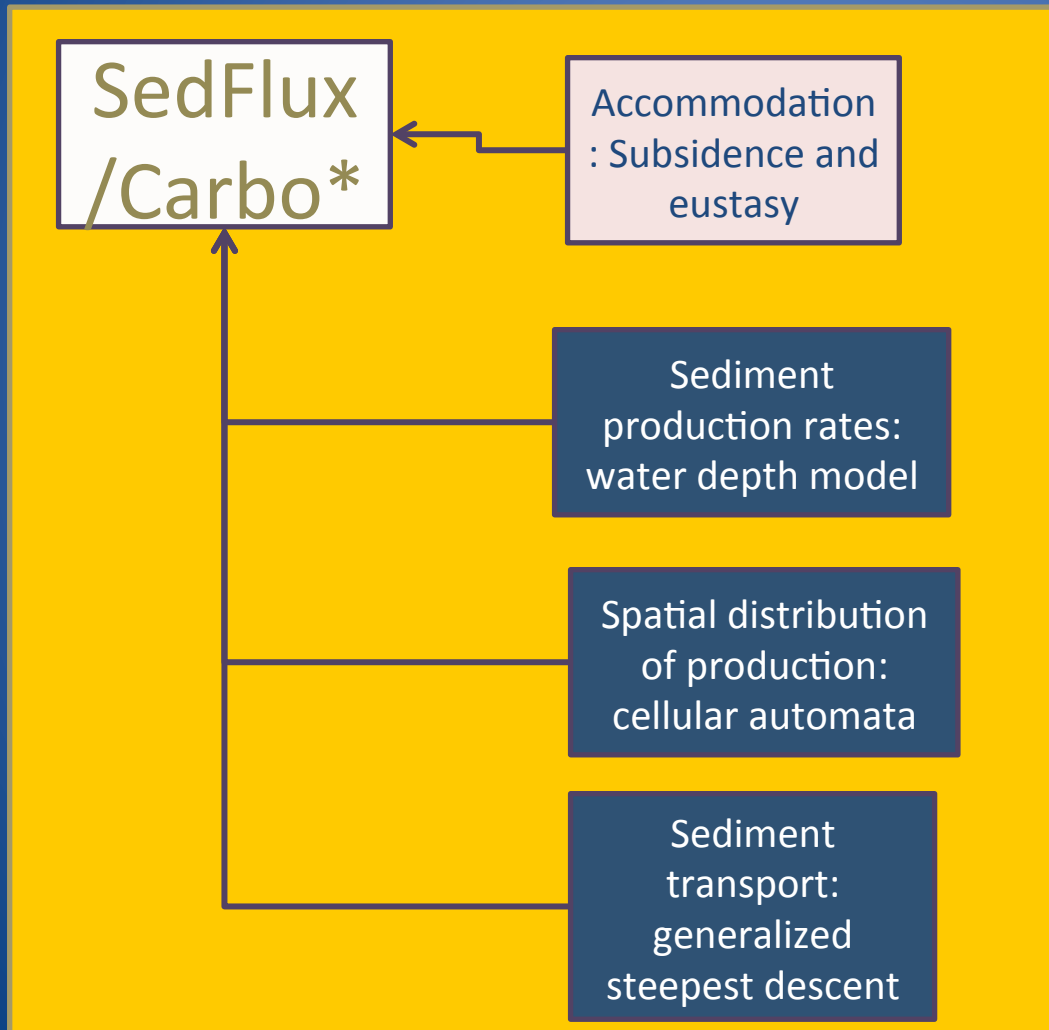
Arena Section:

- A "Driver: CEM" panel contains buttons for "Run", "Configure", and "Elevation". It also has two sub-components: "River" and "Waves", both with green status indicators.
- A "Component: HydroTrend" panel contains buttons for "Configure" and "Discharge", both with green status indicators.
- A "Component: Waves" panel contains buttons for "Configure" and "Waves", both with green status indicators.
- A red line connects the "River" component in the Driver panel to the "Discharge" component in the HydroTrend panel.

At the bottom, there is a "CMT Console" window showing the following text:

```
CCAFFEINE configured without neo and neo components.  
CmdLineClient parsing ...  
  
CmdContextCCA::initRC: Found /data/progs/components/cem_11.03.13/_build/csdms/components/tests/guitest.  
# There are allowed 38 classes in the component path
```

Carbonate Components



Accommodation:
flexural isostasy

Sediment
production rate:
restriction model

Sediment
production rate:
water chemistry

Spatial distribution
of production: LV
population model

Sediment
transport: off-
platform plume

Sediment
transport:
bedload under
unidirectional flow

Carbonate FRG Short to Medium-Term Strategy

Summary plan:

1. Detailed plans to engage with industry, NSF Steppe and NGOs
 - Tasks defined for PhD students, possibly funded by NSF Steppe & direct industry funding
 - Engage with NGOs for prediction for coastal defence reef growth
2. Document and share the carbonate knowledge base in its current form and open it up to contributions from and development by the wider carbonate community
 - Document the existing parameters that are in the knowledge base
 - Share the knowledge base on Google documents
 - Publish via CSDMS web site as an online database product
3. Recruit more carbonate coders
 - Coding group is gradually growing
 - Actively seeking new people who can help us write component code e.g. PhD students and postdocs
4. Change of leadership if Euro-CSDMS progresses rapidly