

Overview of Carbonate FRG and Marine WG

- *Intermediate and Long-Term Goals...*
- *Where are we now?*
- *What next?*

C-FRG Intermediate- and Long-Term Goals

Group aim:

- To identify and address grand challenges for fundamental research on ancient and recent carbonate systems

To be achieved by:

- Creation of next generation of numerical carbonate process models under the umbrella of the CSDMS initiative
- Creation of supporting carbonate systems databases

Assuming that:

- Open-source numerical models and associated quantitative datasets can be state-of-the-art repositories for our knowledge of how carbonate systems work
- Models can be useful experimental tools applied to develop and enhance carbonate knowledge.

C-FRG Where Are We Now?

The story so far:

- *Initial framing meeting, Feb 08*
- *Grant proposal workshop, Feb 09*
 - *Concept outline for Carbonate Workbench*
 - *NSF proposal submitted, July 09*
- *Annual meeting, Oct 09*

C-FRG Where Are We Now?

Carbonate workbench:

- Outline concept
 - Modular system of bolt-together model components
 - Integrated databases of input parameter values (and examples to test model against?)
- Progress to date
 - List of desired modules
 - Some initial progress coding some components

C-FRG Where Are We Now: Members

Peter Burgess (Chair) Royal Holloway University of London
Andrew Barnett BG Group
David Budd University of Colorado
Govert Buijs ConocoPhillips
Bob Demicco Binghamton University
Carl Drummond Indiana University-Purdue University Fort Wayne
Evan Franseen University of Kansas
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Xavier Janson University of Texas at Austin
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Rick Sarg Colorado School of Mines
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Bruce Wilkinson Syracuse University

C-FRG: Status of NSF Proposal

- NSF Proposal - Carbonate workbench: Next Generation Predictive Tool for Carbonate Depositional Systems
- Rick Sarg, Gene Rankey, Chris Jenkins, Don Potts, Dave Budd with associates Bob Demicco, Peter Burgess, Jody Webster and interested parties
- \$1.7 million requested
- Decision due November

C-FRG What Next?

General

- Await NSF proposal result...
- Continue to expand membership
- Develop Workbench...

Carbonate workbench

- Create a CSDMS driver for carbonates – today??
- Create a carbonates GUI in Caffeine – today??
- Write pseudo code outlines for selected modules OR import some existing code
- What existing transport modules could we use?
- Make choices on suitable population models
- Begin to define database structure and content
- Working prototype with several modules ready for meeting Oct 2010??

C-FRG Results from Breakout Session

What carbonate properties should SedGrid store and how?

The hypothetical cell: [Aa 0.05; Ag 0.90; At 0.05]

The hypothetical cemented cell: [Aa 0.05; Ag 0.80; At 0.05; Bd 0.10]

Transport dictionary	Aa	...	Ag	...	At	...	Bd	...
Transportable	Yes		Yes		No		No	
Grain size (mm)	2mm		10mm		Null		Null	
Bulk density (gcm ⁻³)	2.1		2.2		Null		Null	
Grain shape??	Messy		Spherical		Null		Null	

Production dictionary	Aa	...	Ag	...	At	...	Bd	...
Name	Coral X		Grainwithnoname		Seagrass		Cement	
Hardness	Skeletal		Skeletal		Soft		Null	
Feeding habit	Filter		Mobile carnivore		Photosynth		Null	
Trophic Type	Pred, sessile		Pred, mobile		Primary		Null	
Trophic level	5		7		1		Null	
Ingestion size	Large		Large		Small		Null	
Temp range	21-27		16-27		15-27		Null	
Salinity range							Null	
Mineralogy	Aragonite		Calcite		Aragonite		Aragonite	

Roughness dictionary	Aa	...	Ag	...	At	...	Bd	...
Roughness	Rough		Smooth		Rough		Smooth	
Form	Upstanding						Flat	
Bafflement	Some				Lots		None	
Form drag	2.1							

C-FRG Action Items

Action Item	Who	When
• Finalise a prototype list of feature tables and properties e.g. for sediment transport	Colorado	
• Post feature table list on the web site and circulate to invite community to start populating with carbonate features		
• Contact EcoPath authors/owners to determine rights of access and modification on the code and run an example	Chris	
• Access Beach and start the process of code development	Pete	Starting now
• Contact Bob Demicco and find out what progress he has made with transport routines	Pete	Now
• AGU talk	Rick	Now