

Quantitative Clastics Lab

@ClasticsLab
@zzsyvester

2020 & beyond

<http://www.beg.utexas.edu/qcl>

At the **Quantitative Clastics Laboratory (QCL)**, we develop predictive models for processes & controls on sediment transport & the stratigraphic evolution of depositional systems, w/ applications in **reservoir characterization, modeling, development, correlation, & ‘source to sink’ predictions for frontier exploration.**



We have two themes: 1) **reservoir-scale** depositional-system characterization, modeling, & flow simulation to better understand processes that impact connectivity & heterogeneity; 2) **exploration-scale** ‘source to sink’ analysis to evaluate correlation, reservoir presence, & quality in the Permian basin & circum-Gulf of Mexico.

Theme 1. Reservoir geology

Why QCL? What sets us apart?

- 1) Our multi-theme, **‘source-to-sink’ breadth.**
- 2) We **develop stratigraphic models** & leverage commercial & open-access modeling software.
- 3) We **develop new technology** for analysis of **large subsurface datasets & machine learning.**
- 4) We **educate the next generation** of interdisciplinary, quantitative geoscientists!
Talented group of students & faculty/staff advisors.

Challenges

- Architectural elements
- Dimensions
- Stacking/connectivity
- Lithology – few/no wells

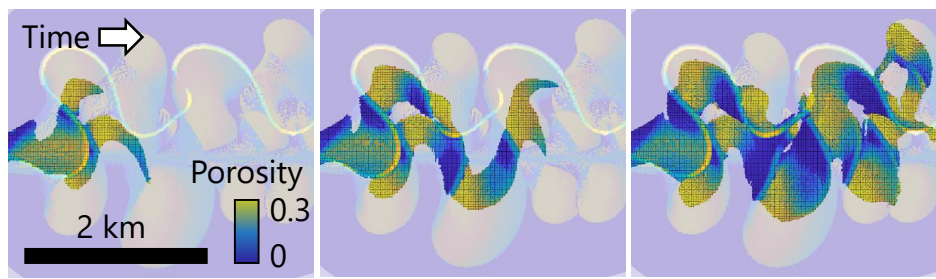
Data deliverables

- Outcrop models/photogrammetry
- Subsurface seismic horizons, maps, log correlations, core facies interpretations
- Earth-surface, time-lapse depositional evolution
- Reservoir-analog models
- Software

2019 sponsors



The QCL has capabilities in **stratigraphic modeling & flow simulation!** We approach reservoir geology w/ an initial phase of characterization, followed by modeling, & flow simulation to understand the control of stratigraphic evolution & facies architecture on fluid flow during production.



Contacts

- jake.covault@beg.utexas.edu
- zoltan.sylvester@beg.utexas.edu
- tim.lawton@beg.utexas.edu
- stockli@jsg.utexas.edu

<https://www.sintef.no/projectweb/mrst/>

Theme 2. Exploration geology

Fall meetings

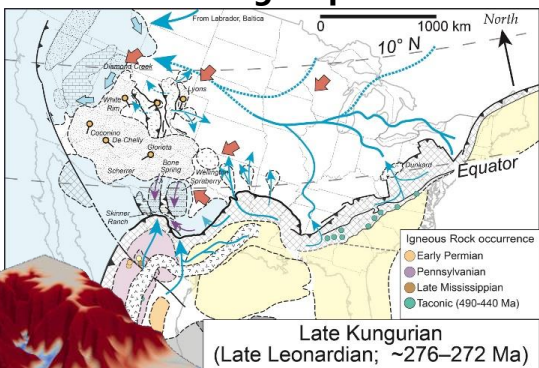
Challenges

- Where's the (good) sand?
- Reservoir presence?
- Reservoir composition (quality)?

Data deliverables

- Provenance data
(detrital zircon geo-thermochronology & petrography)
- Sediment-routing maps
(focus on Permian Basin & circum-Gulf of Mexico)
- Models
- Software

Sediment-routing maps



'Source-to-sink' modeling

late Sept.-early Oct.

Meeting & field trip, fluvial & shallow-marine depositional systems, Green River, UT

Featuring: **Cole Speed** (PhD) & **Kirt Campion**

(BEG Research Fellow, retired Marathon & ExxonMobil)

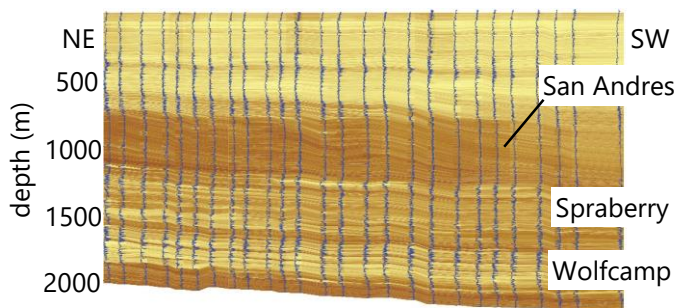
mid-late Oct.

Permian Basin workshop, Austin

late Oct.-early Nov.

Gulf of Mexico workshop, Austin

Automated log correlation



Mz-Cz Sevier-Laramide Rockies– **SMAf**

Zoltan Sylvester
Tim Lawton
Danny Stockli
Kirt Campion
Students!

3-5 day field workshop S. California– **DW**
Zoltan Sylvester
Jake Covault

Multiple projects in USA GOM – range of **dep. sys.**

Zoltan Sylvester
Jake Covault
Tim Lawton
Danny Stockli
Dallas Dunlap
Mike Hudec
Students!

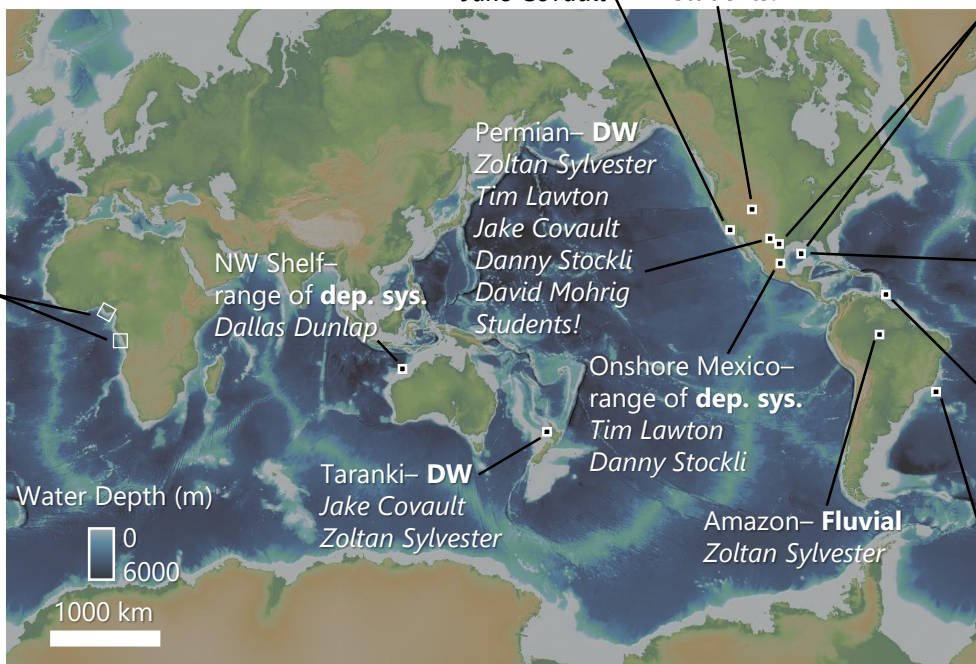
Mexico GOM– **DW**
Tim Lawton
Danny Stockli
Jake Covault

Caribbean– **DW**
Jake Covault
Dallas Dunlap
Zoltan Sylvester

Campos– **DW**
Jake Covault
Dallas Dunlap
Zoltan Sylvester
Mike Hudec

Global experience & field areas

Exploration-development experience– **DW**
Zoltan Sylvester
Jake Covault



DW- Deepwater, **SMAf**- Shallow-Marine and Fluvial, **dep.**- depositional, **sys.**- systems, **GOM**- Gulf of Mexico