

# **U.S. EPA Draft Rules on Geological Storage: Selected Stakeholder Feedback**

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# **U.S. EPA Draft Rules on Geological Storage: Selected Stakeholder Feedback**

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**UK-BEG Carbon Capture and Storage  
Technical Workshop**

**Houston, TX**

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# EPA draft rules

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- Published Summer '08
- Focused on protection of ground water under the Safe Drinking Water Act
- 2 groups of stakeholders:
  - Oil and gas industry – CO<sub>2</sub>-EOR / GS in depleted oil and gas fields
  - Water industry: municipalities, private companies, well drillers



# Some issues covered by the EPA draft rules

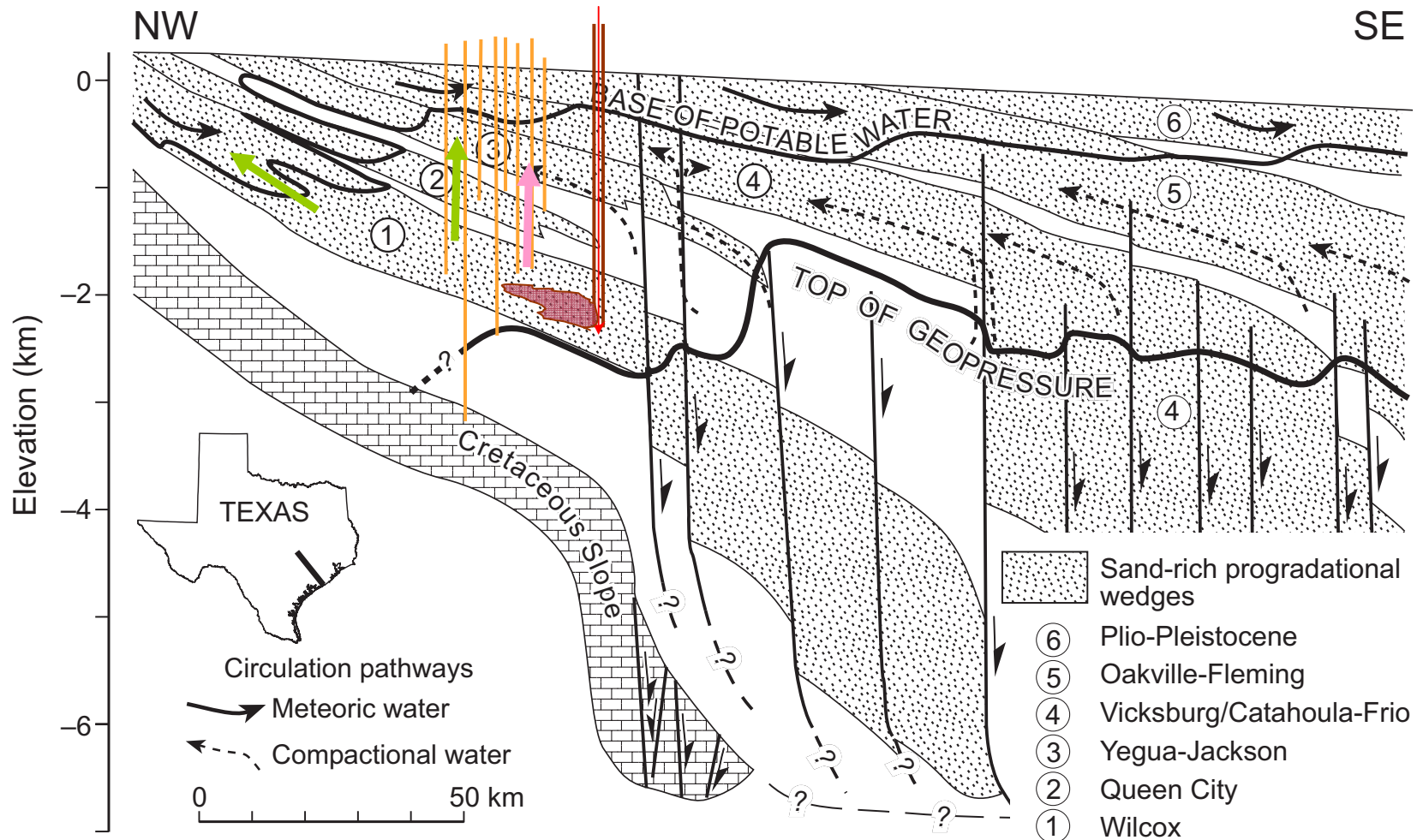
*Bureau of Economic Geology*

- Siting criteria
  - Area of review / corrective action
  - Well construction requirements
  - Operating/monitoring requirements
  - Post-injection care
- 
- Two main differences between CO<sub>2</sub>-EOR and CO<sub>2</sub> Storage:
    - pressure field: in EOR, CO<sub>2</sub> is injected but both oil and CO<sub>2</sub> are produced with no or little pressure increase
    - time frame: safety concerns only during operations / no excess pressure after end of operations



# Gulf Coast geologic features

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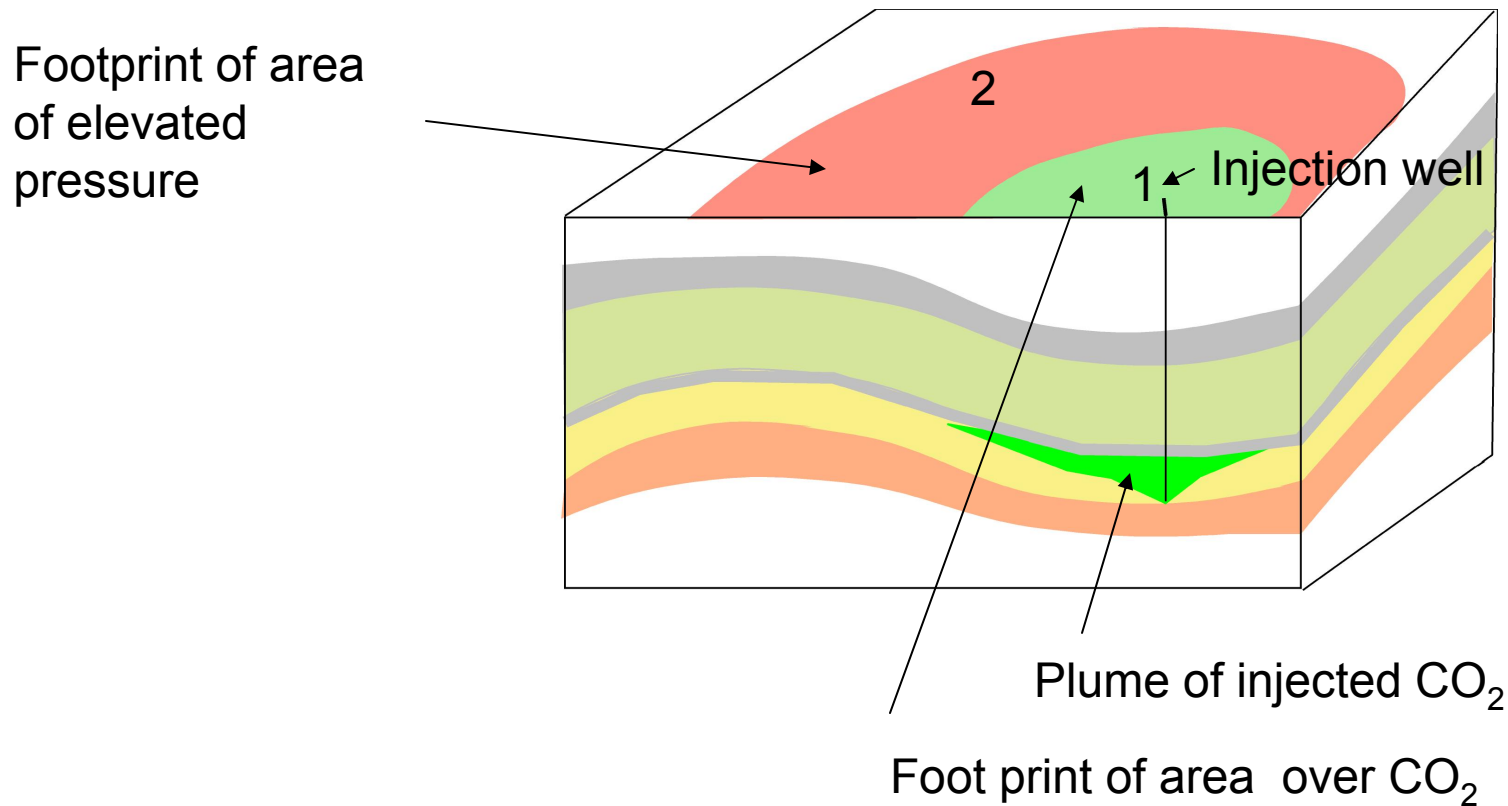
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Source: Galloway (1982) and Galloway et al. (1982)



# Two Areas of Concern in Area of Review

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**Concept of pressure trespass**

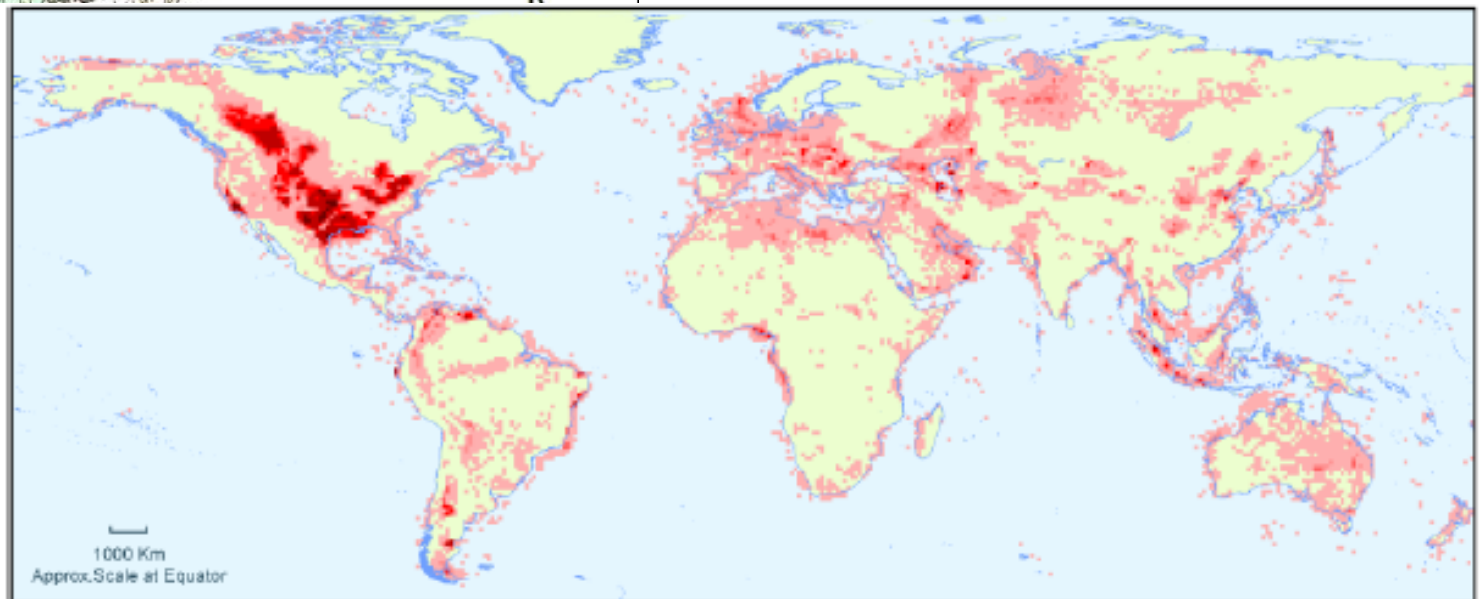
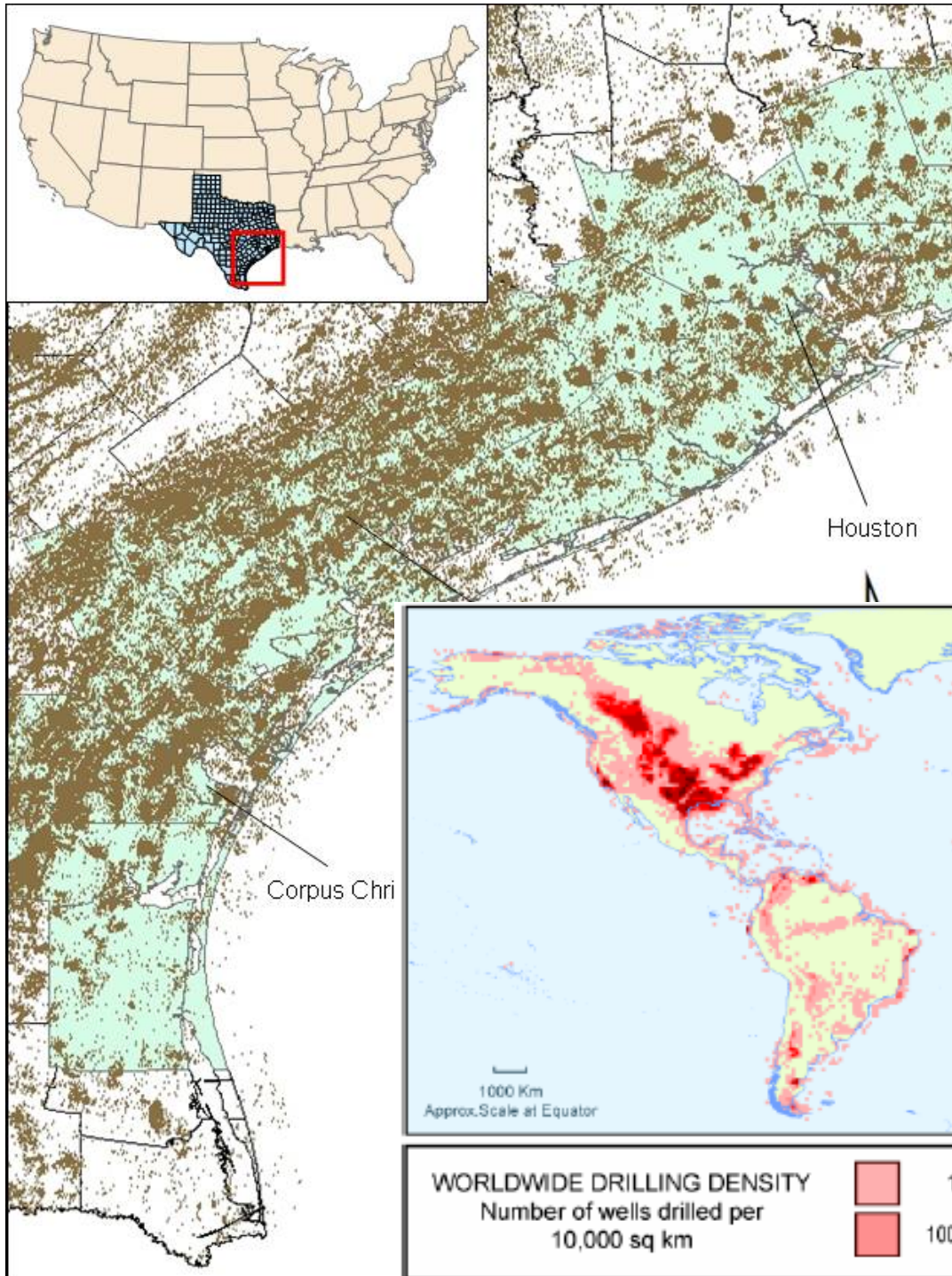




# Well Density

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Texas:	1.6 well/km <sup>2</sup>
Texas Gulf Coast:	2.4 well/km <sup>2</sup>
Alberta Basin:	0.5 well/km <sup>2</sup>
Most O&G provinces:	<<1 well/km <sup>2</sup>



WORLDWIDE DRILLING DENSITY  
Number of wells drilled per  
10,000 sq km



1 - 100

100 - 300



300 - 1,000

1,000 - 4,400



4,400 - 23,400

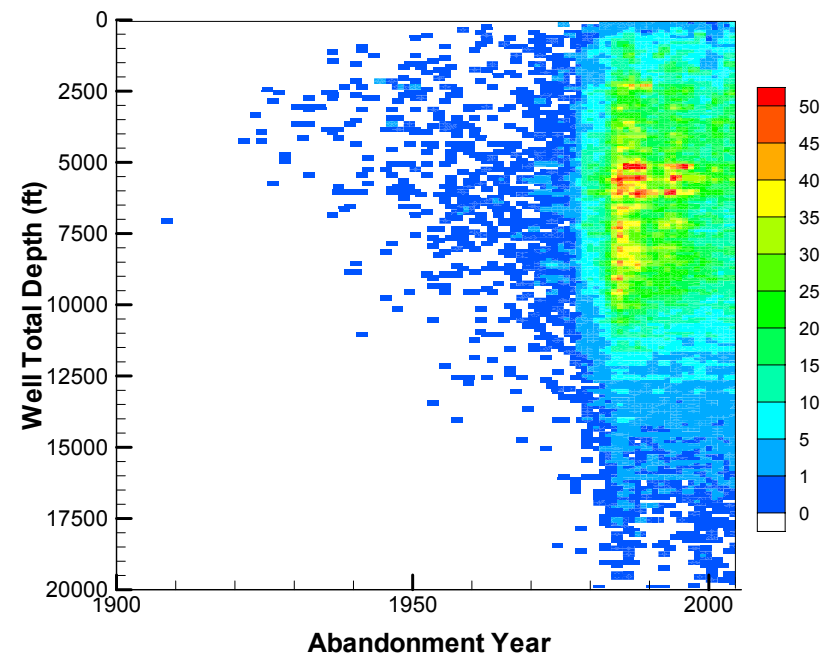
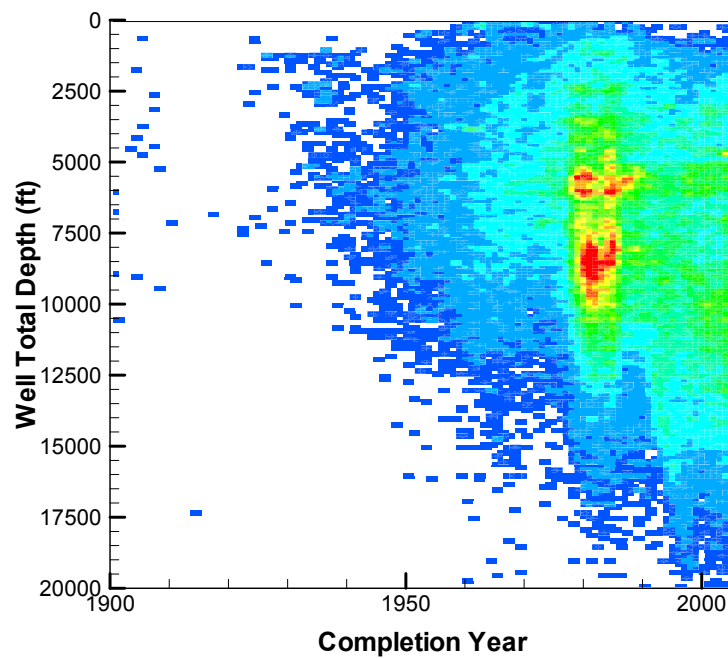
23,400 - 61,000



No Wells / Data

# Well Depth Varies with Completion Year

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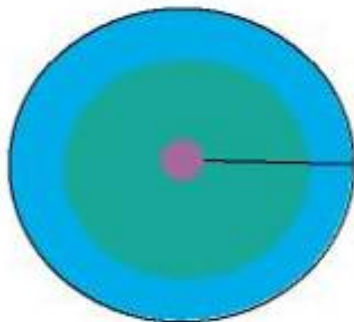
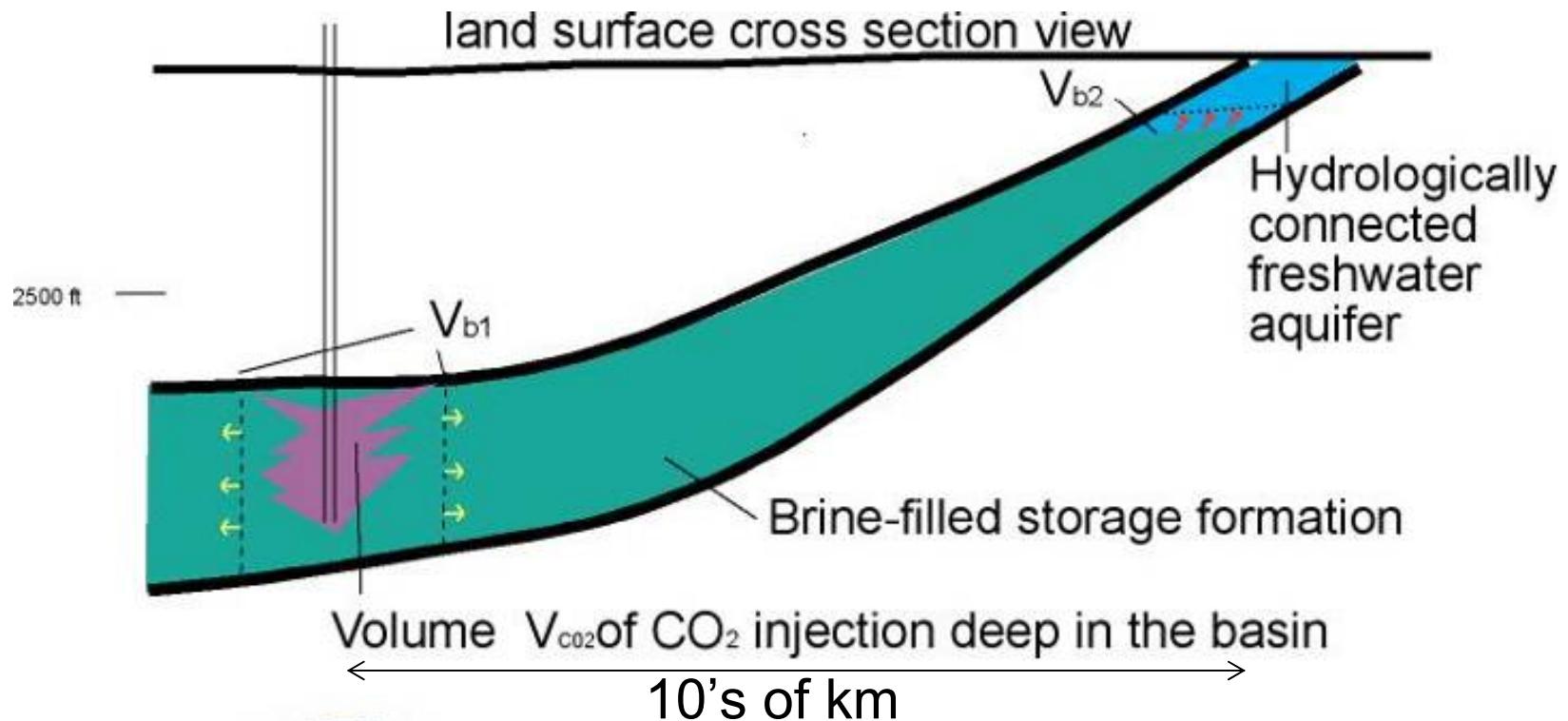
Texas Gulf Coast data only





# Water displacement

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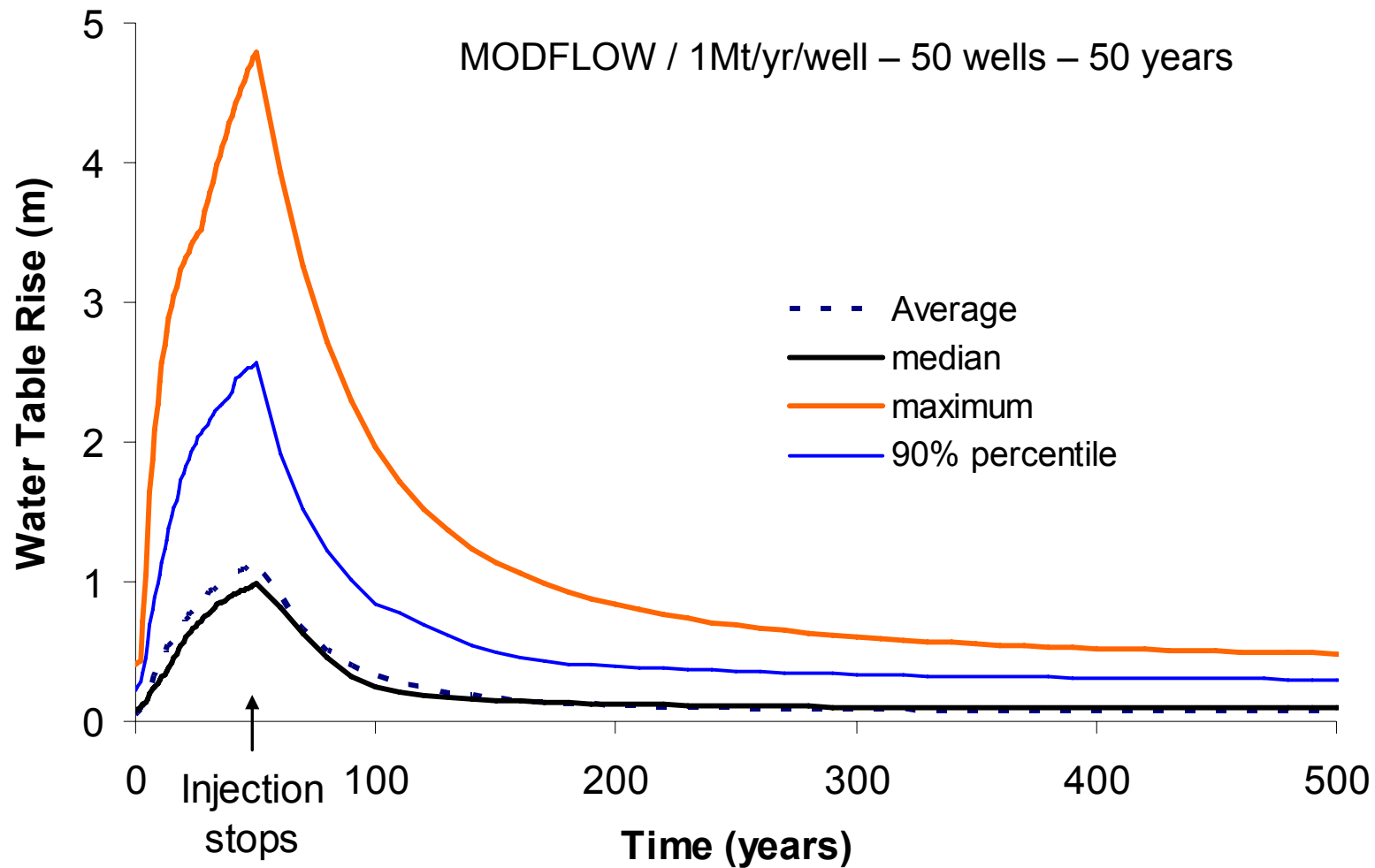


Map view  
of Open  
Hydrologic  
Systems



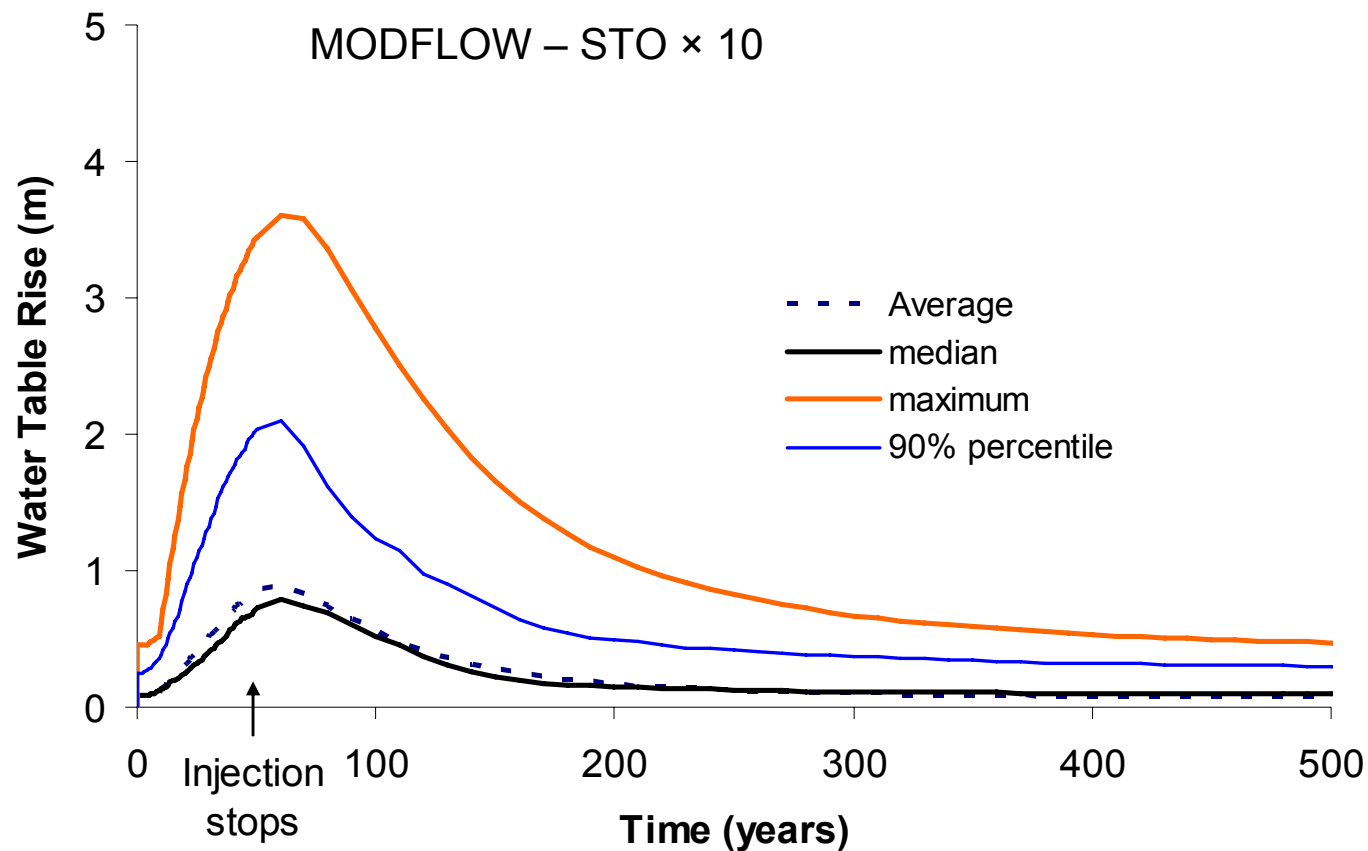
# Impact assessment

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# Impact assessment (higher mudstone compressibility)

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# Stakeholder concerns

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- Water industry:
  - Need reassurance that no brine contamination, no metal mobilization will occur
  - Any contamination can technically be fixed (treatment....). However, water is a under-valued low-priced commodity.
- Oil and Gas industry:
  - Need reassurance that CO<sub>2</sub>-EOR won't be impacted in general by GS
  - Would like to combine EOR and GS operations (credits) and to transition smoothly from EOR to GS

