

Correlation of Radon Isotopes and Carbon Dioxide Emissions along Muddy Creek Road: LaBarge, WY

Virginia Marcon

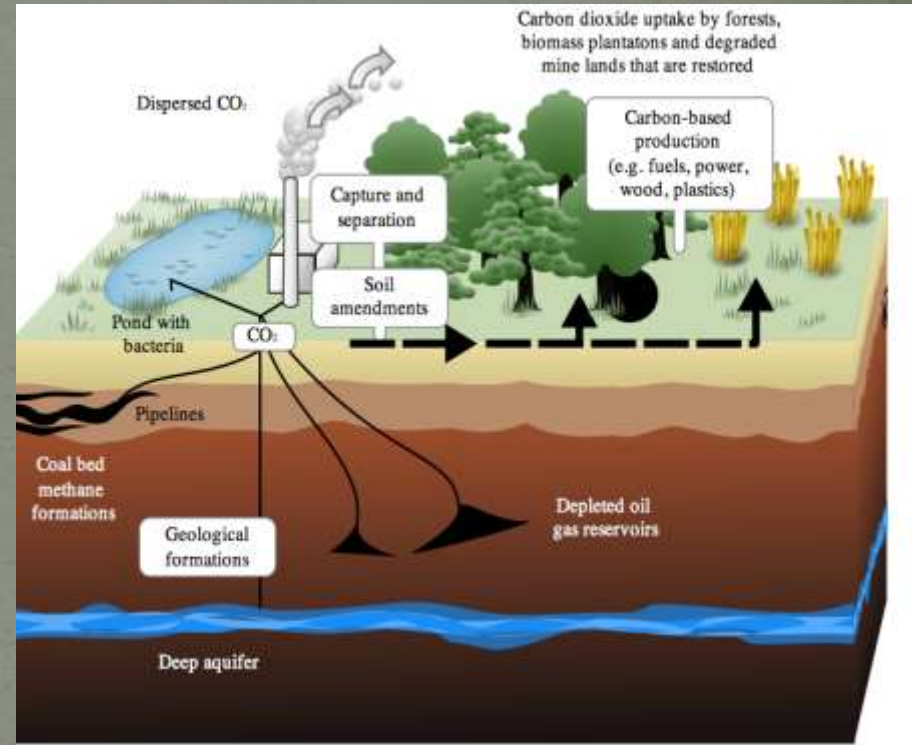
Advisors: Drs. John Kaszuba and Kenneth W. Sims

Outline

- What is carbon sequestration?
- Background of the science
- Field Site
- Methods
- Results/Discussion
- Future

What is Geologic Carbon Sequestration?

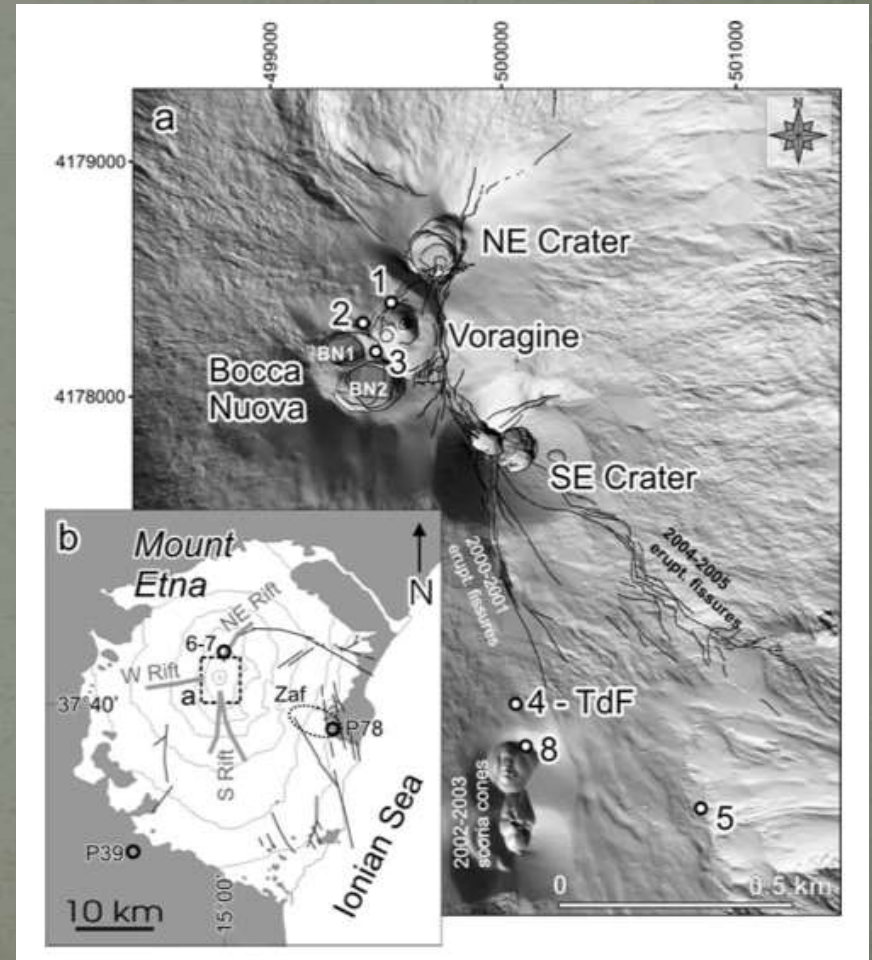
- Capture CO₂ from anthropogenic source
- Stored:
 - Oil and gas reservoirs
 - Unmineable coal seams
 - Deep saline reservoirs
- Possible source of reducing green house gas emissions



http://www.ornl.gov/info/ornlreview/v33_2_00/research.htm

Background Science

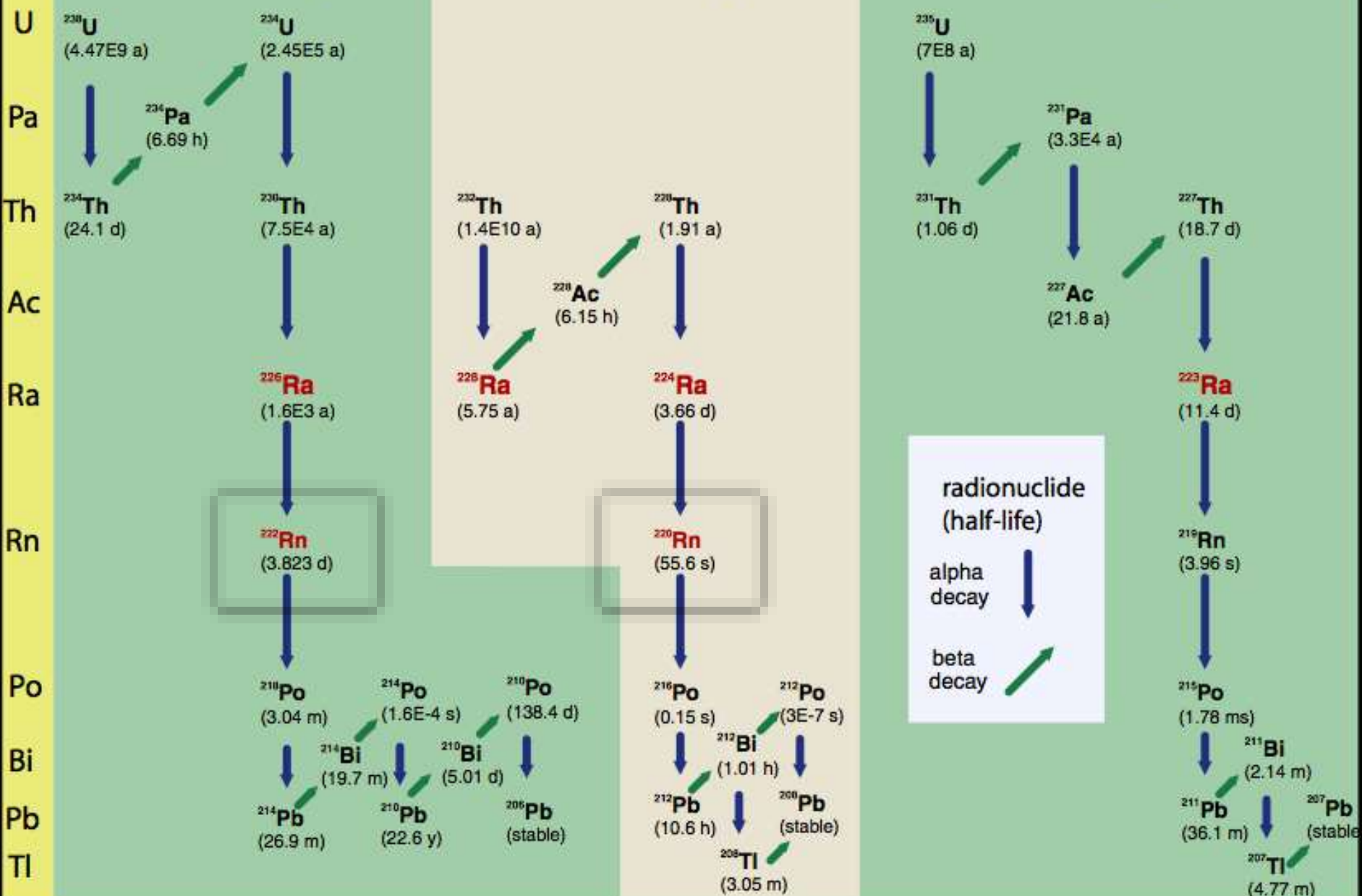
- Gimmaco et al. 2007
 - Relationship in volcanic systems: the higher the flux of CO_2 , the lower the ratio between ^{220}Rn and ^{222}Rn



238-Uranium Decay Series

232-Thorium Decay Series

235-Uranium Decay Series



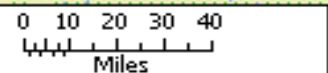
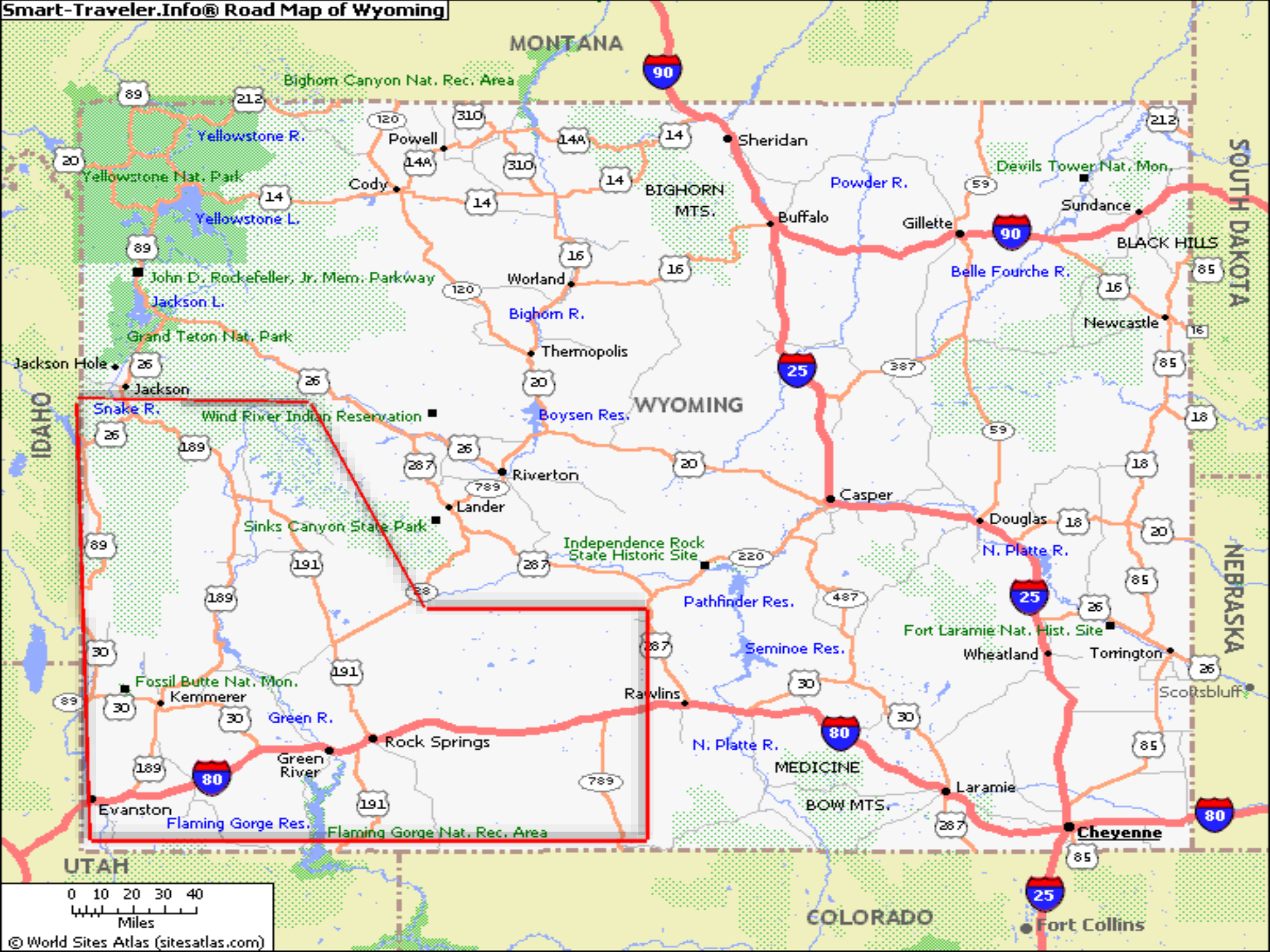
Natural Analogues

- Natural analogue: places where CO₂ have been naturally stored for a geologically significant amount of time
 - Leaks through faults and fractures give insight to understanding fundamental fluidrock processes
 - Investigate and improve of evaluating integrity of caprock formations for future artificially charged locations.
 - How future formations may react when charged with anthropogenic CO₂

Goals

- Assess discrete Radon and CO₂ soil flux
LaBarge CO₂ Field
- Determine: subsurface structure, caprock integrity, and subsurface behavior of CO₂





Legend

- Prospective Transects
- Muddy Creek Rd
- Data Points
- Cities
- CO2 Wells

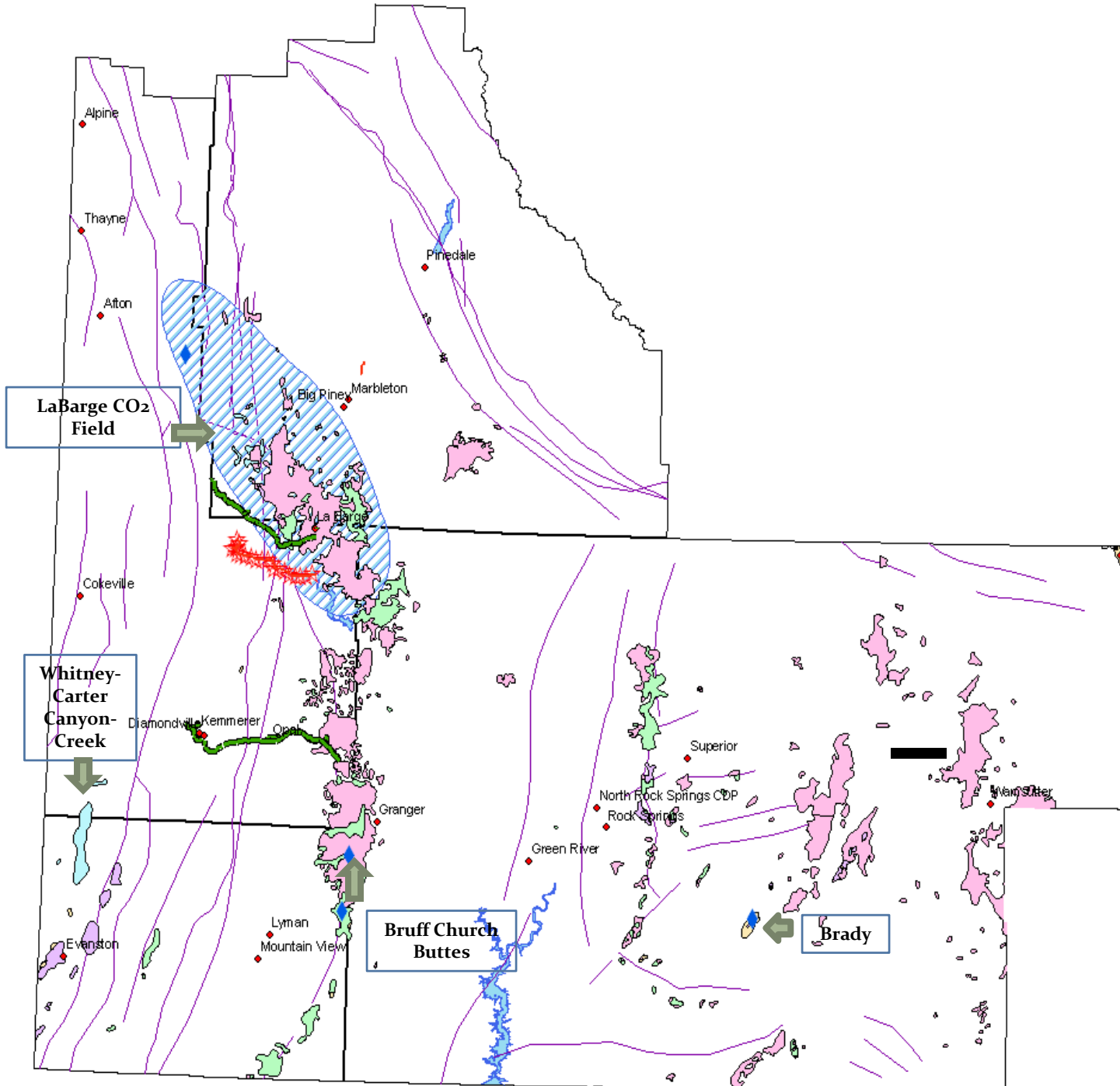
Oil and Gas Fields

AGE

- JT
- LK
- LP
- PP
- UK
- CO2 Producing Fields

- Faults
- Counties

Background Gamma Value



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Oil and Gas Fields

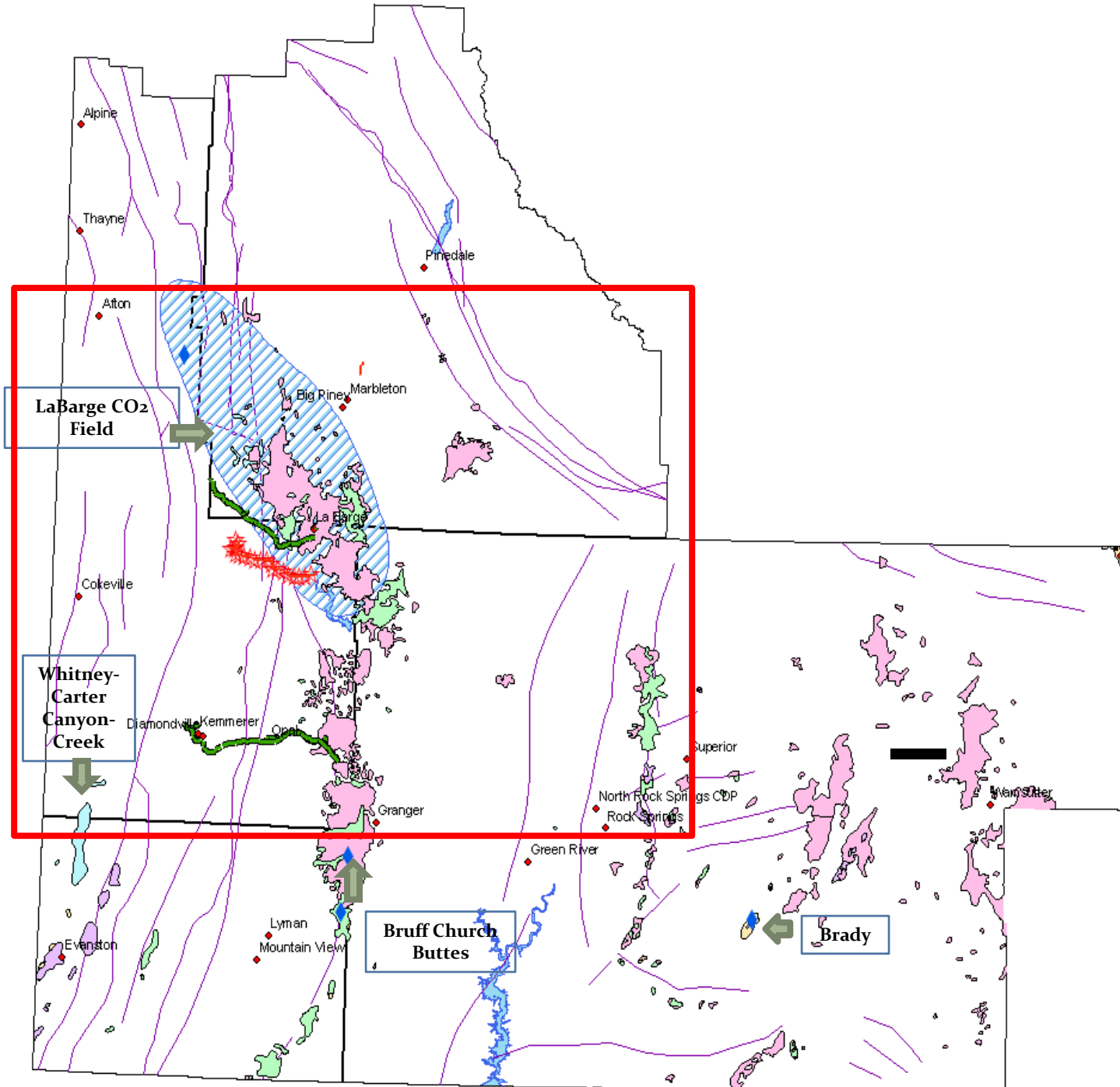
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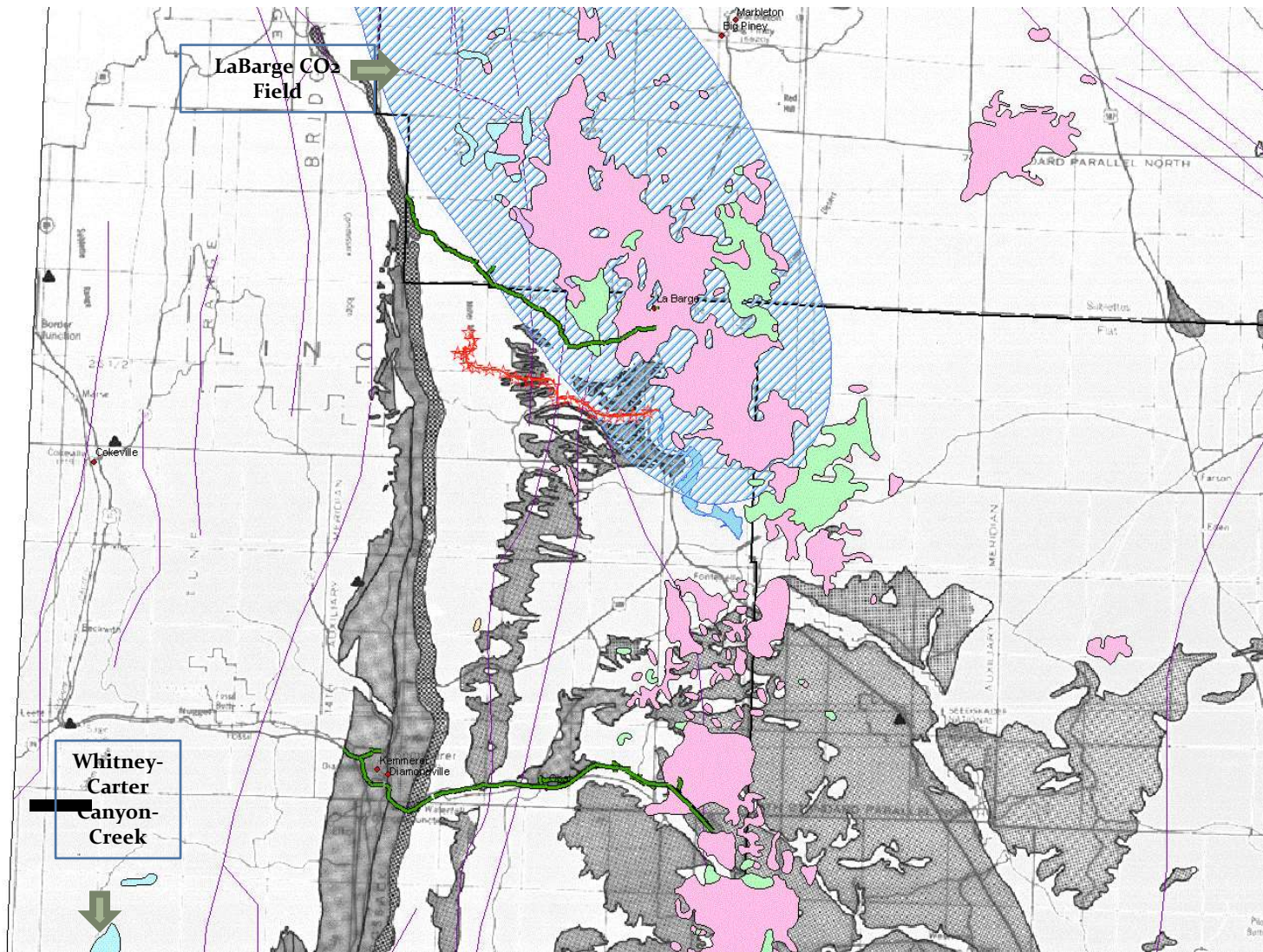
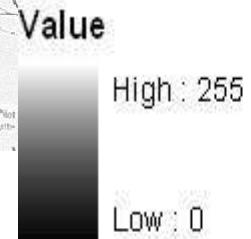
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Methods

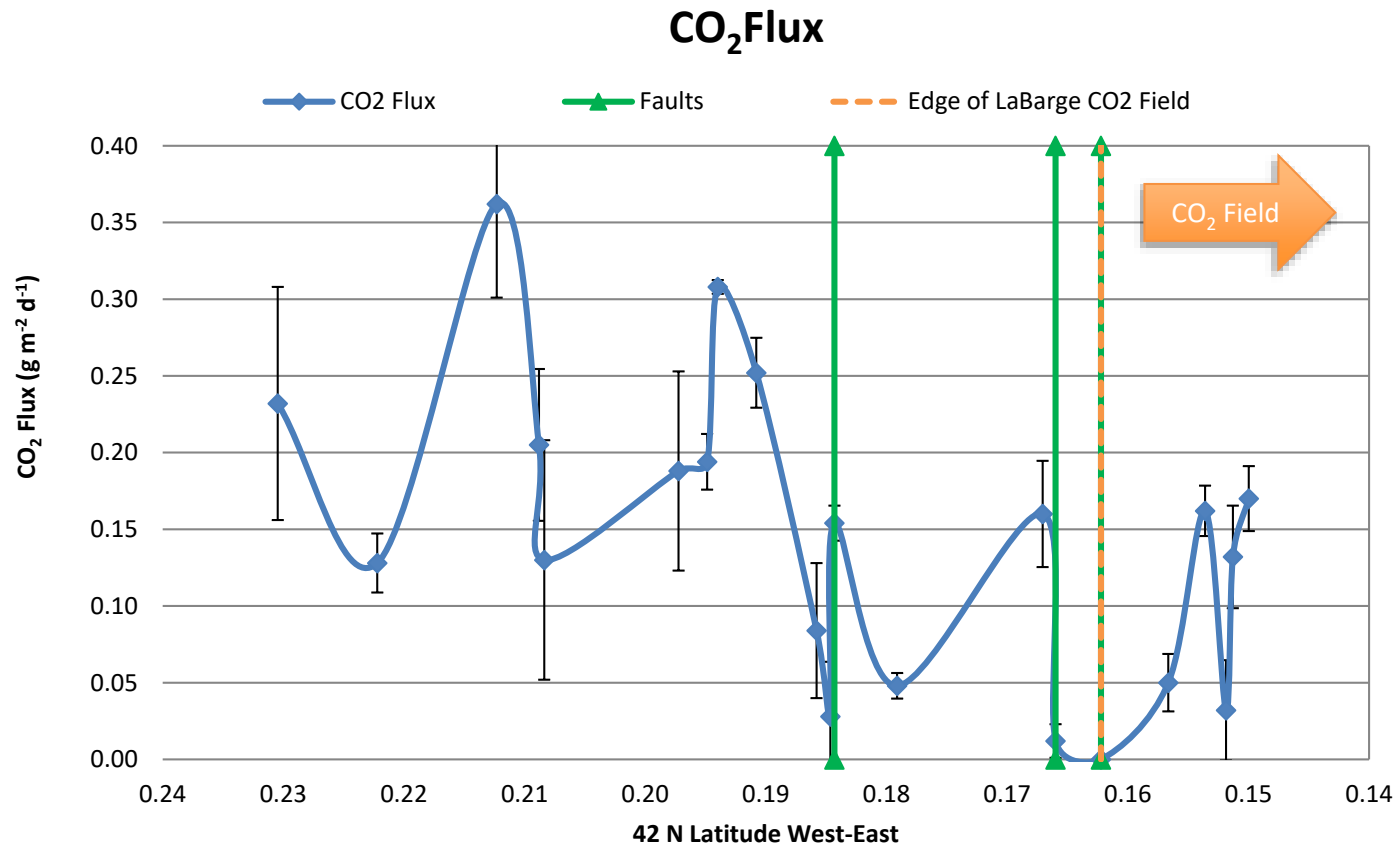
CO₂ Flux meter



RAD7

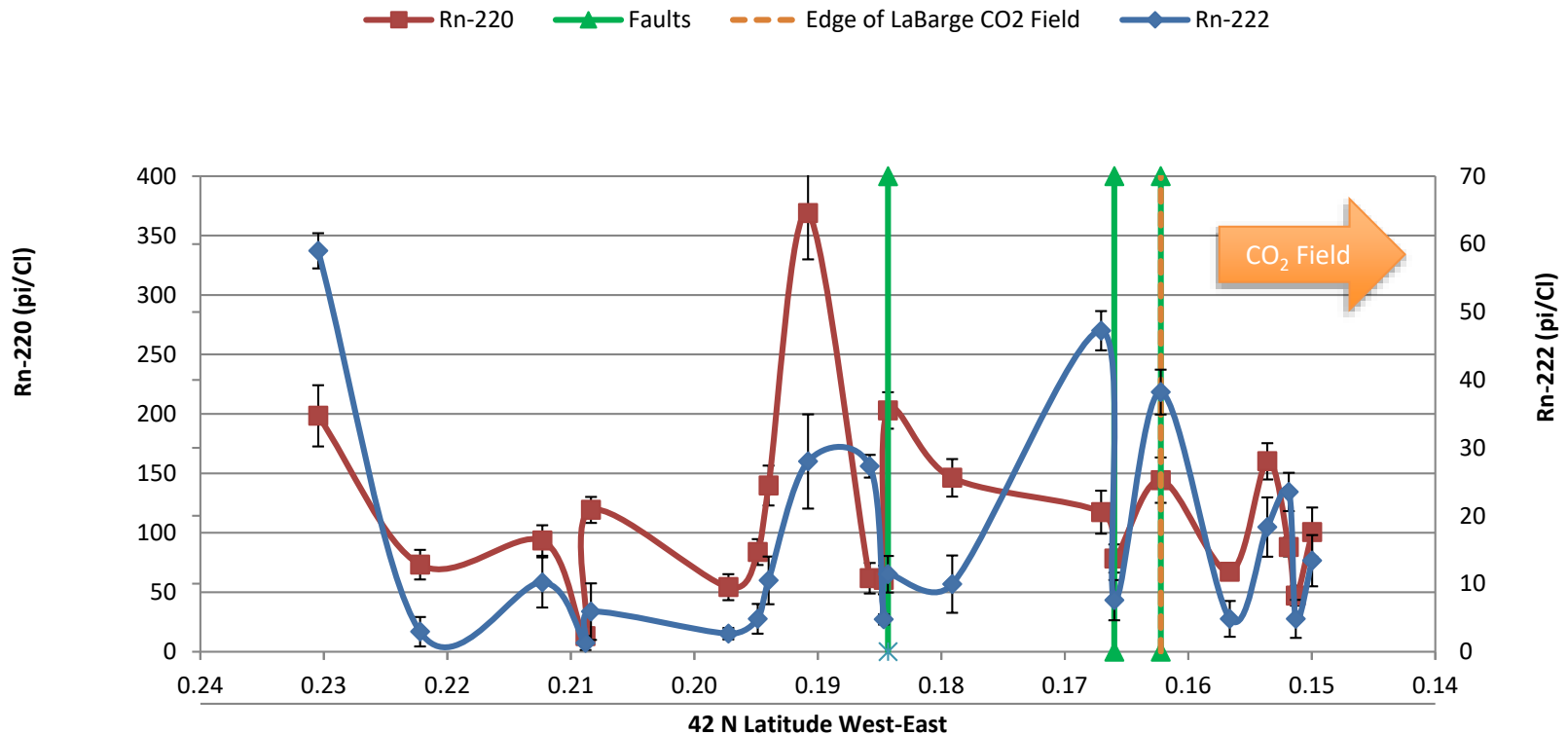


Results: CO₂



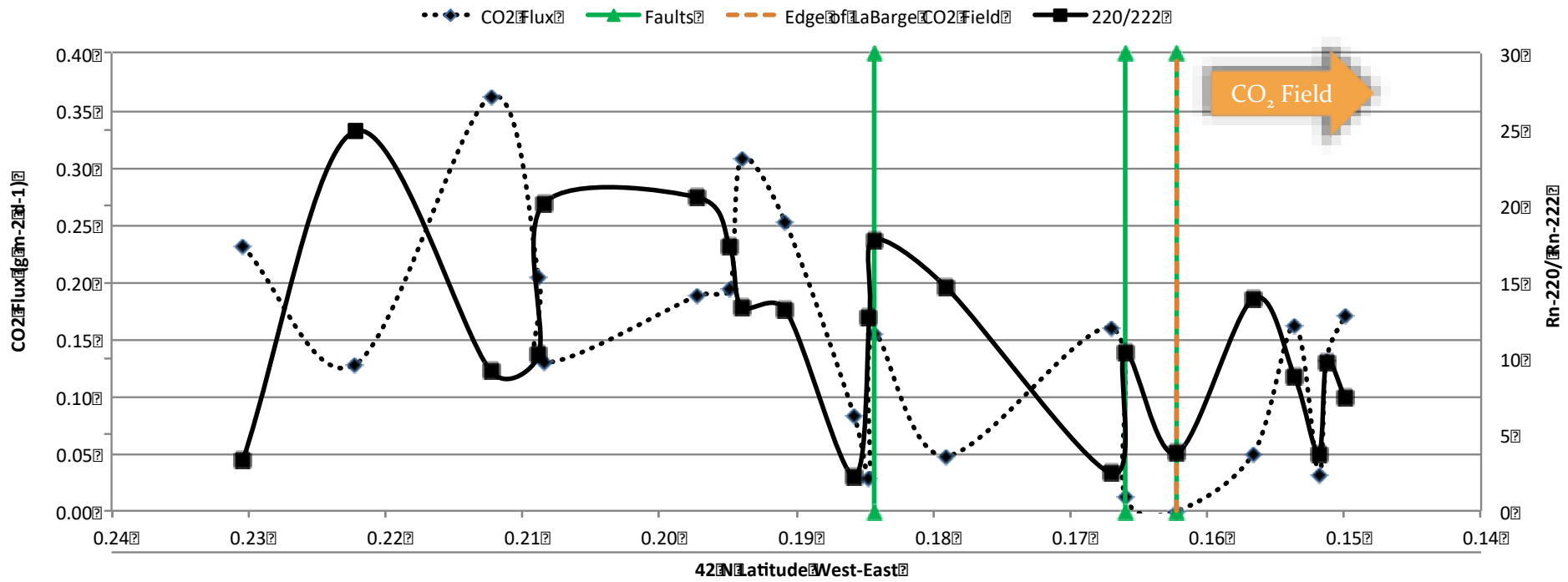
Results: Radon

Radon West to East

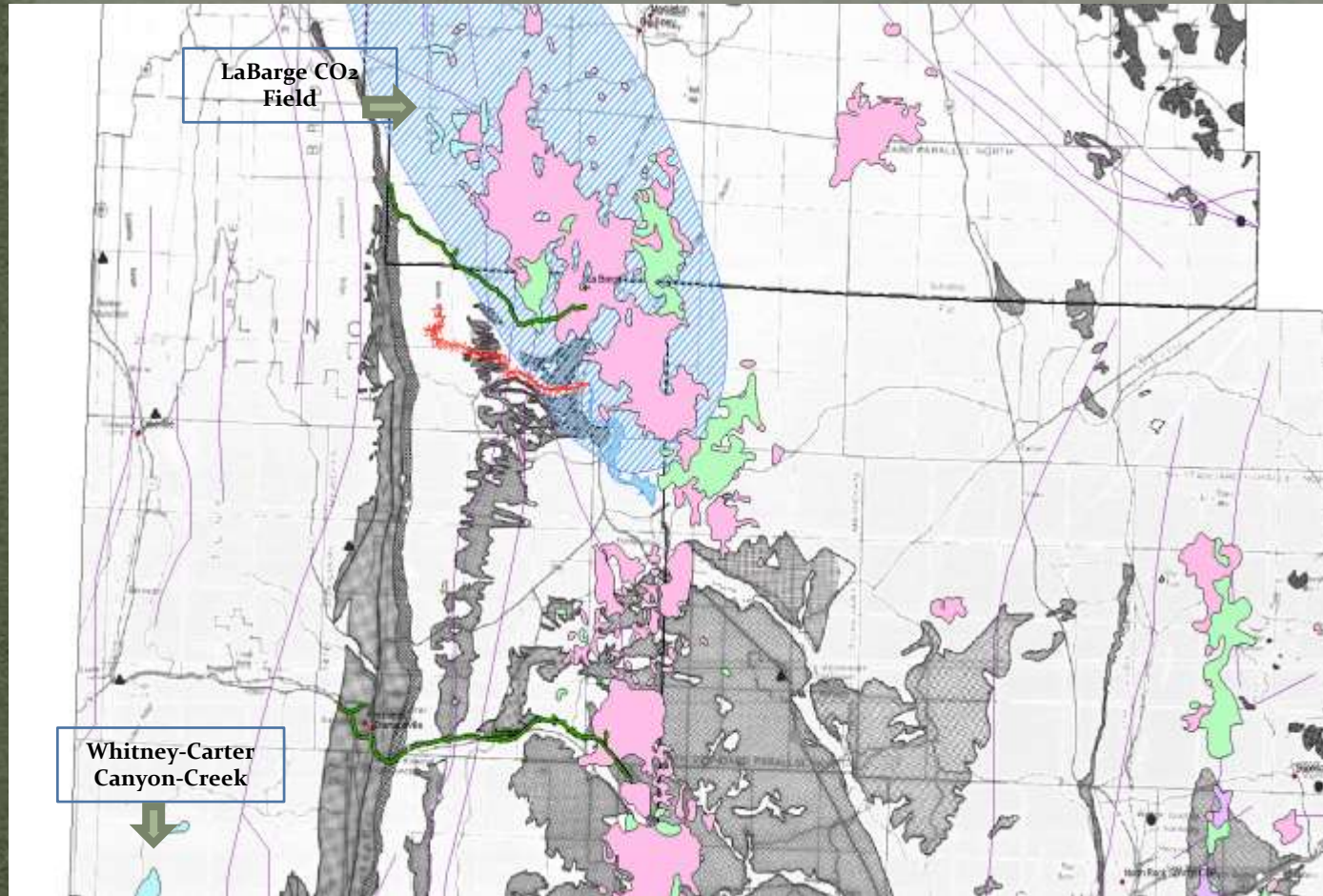


Results

Spatial Correlation



Future Research



- Muddy Creek Rd
- LaBarge Creek Rd
- Lithology Radon Study

A photograph of a sunset or sunrise sky with colorful clouds. The sky is a mix of blue, orange, and purple. The clouds are scattered and have a soft, glowing appearance. In the foreground, there is a dark landscape with some buildings and a body of water. The word "Questions?" is written in white, serif font across the center of the image.

Questions?

Results continued

Spatial Correlation

