

# Biomass & CCS in Washington

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WASHINGTON STATE DEPT OF  
**NATURAL  
RESOURCES**  
WASHINGTON  
GEOLOGICAL SURVEY

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Sponsored by Department of Energy DE-FE0031837, Subaward P0019698

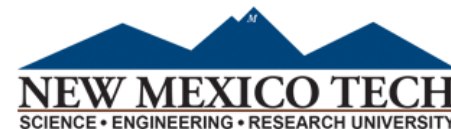






Photo: Carolyn Kelly, DNR





## **BiCRS**

Biomass Carbon Removal and Storage

## **BECCS**

Biomass Energy, Carbon Capture, and Sequestration







**BECCS in WA can relieve corporate tax burden**  
**while promoting forest health**  
**and permanently sequestering CO<sub>2</sub> in basalt**

# How BECCS Works

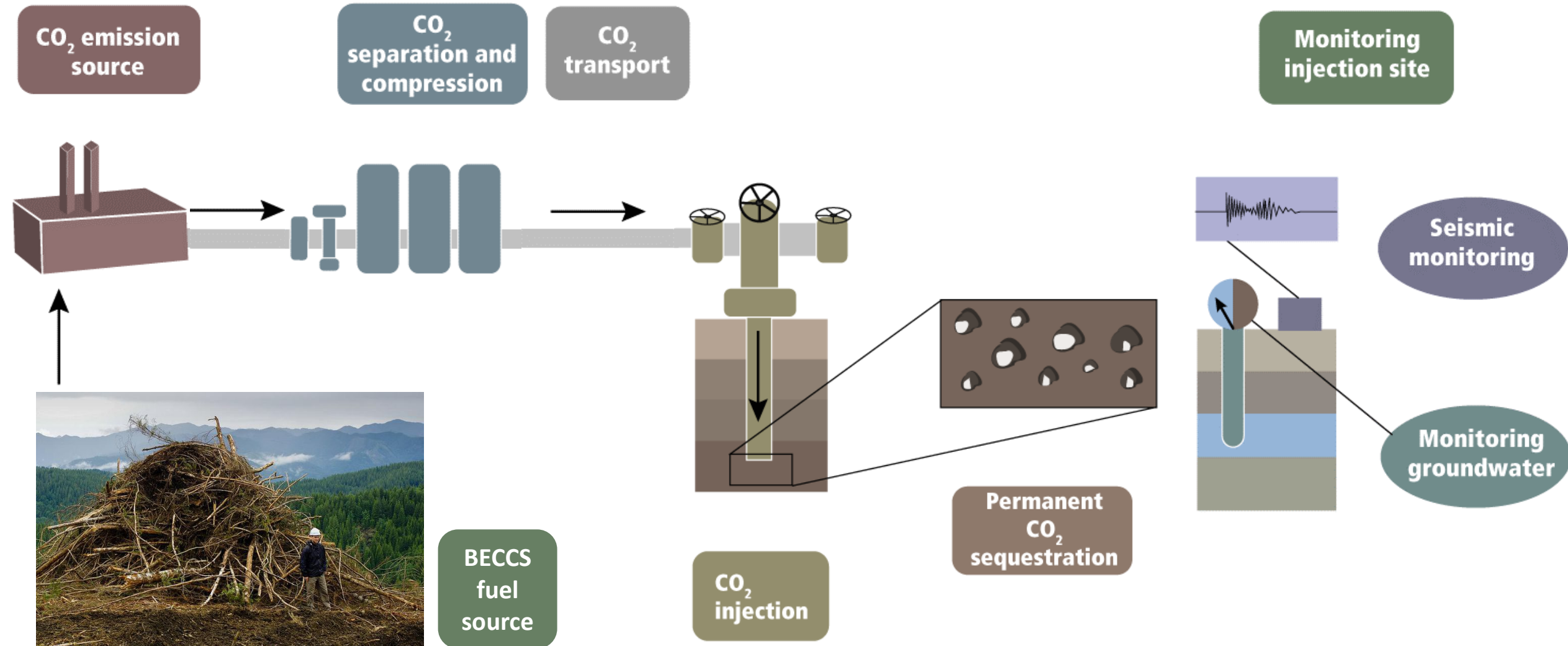






Photo: Carolyn Kelly, DNR



# CO<sub>2</sub> Reservoirs in Washington


Primary sink: Columbia River Basalt Group (east side)

Secondary sink: Eocene Sandstone (west side)



Photo: Dan Coe, WGS/DNR



An aerial photograph of a deep, rugged canyon with distinct horizontal rock layers. A river flows through the bottom of the canyon, winding between the steep, eroded walls. The lighting is warm, suggesting late afternoon or early morning.

1. Wildfire mitigation

2. Market for forest thinning product

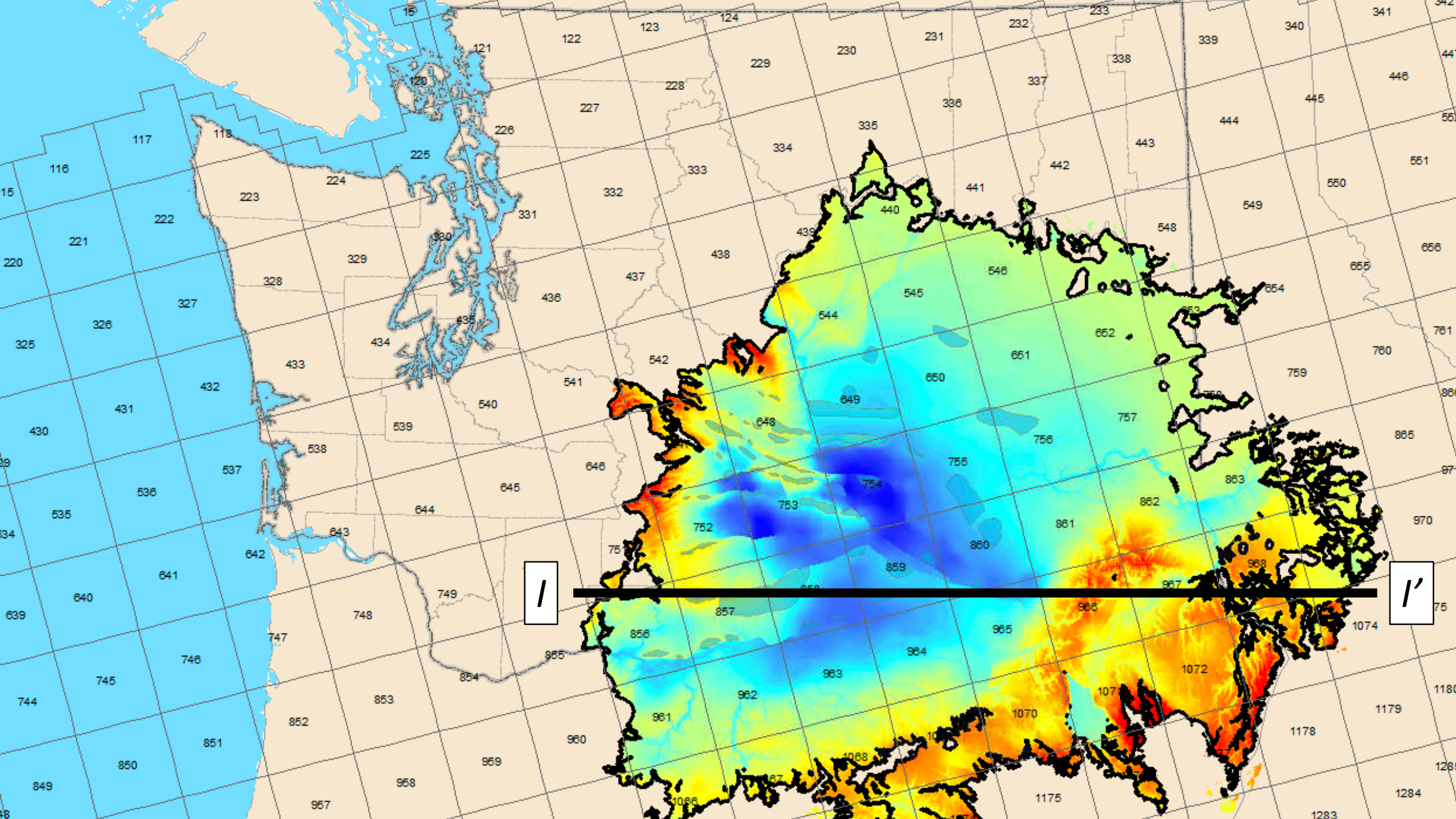
3. State lands leasing revenue (injection)

4. Meet WA Energy Strategy GHG reduction goals

5. Enter CA (and broader) LCFS credit markets

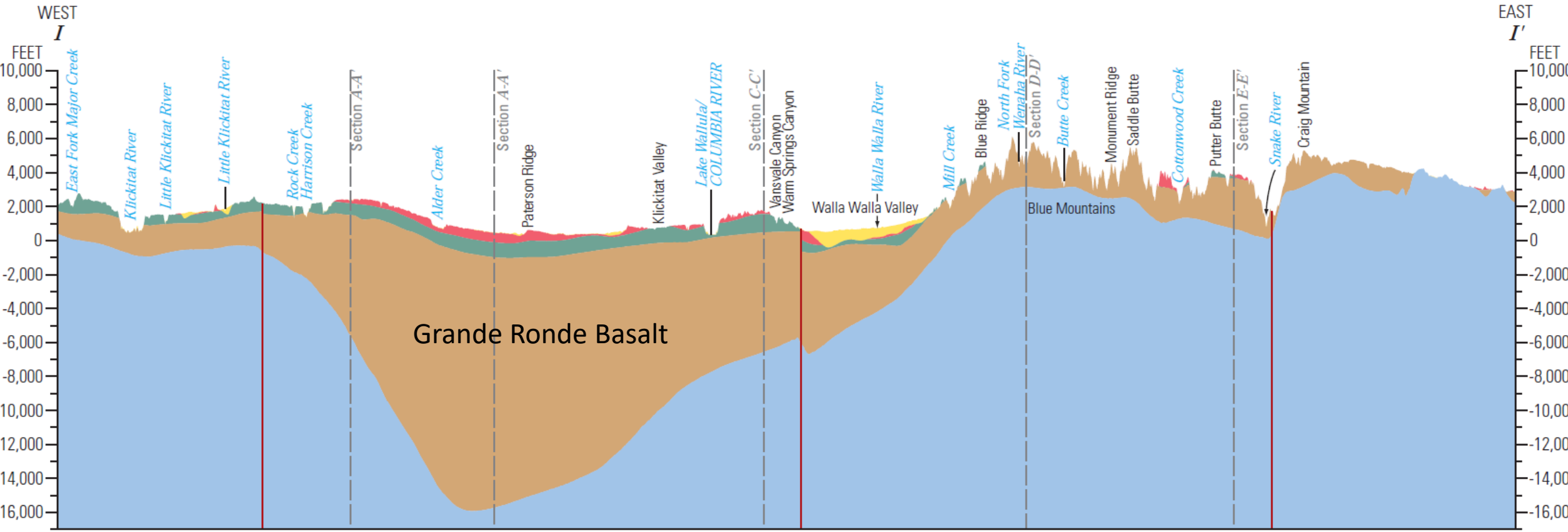
6. Rural economic development







# CRBG Stratigraphy



20 miles

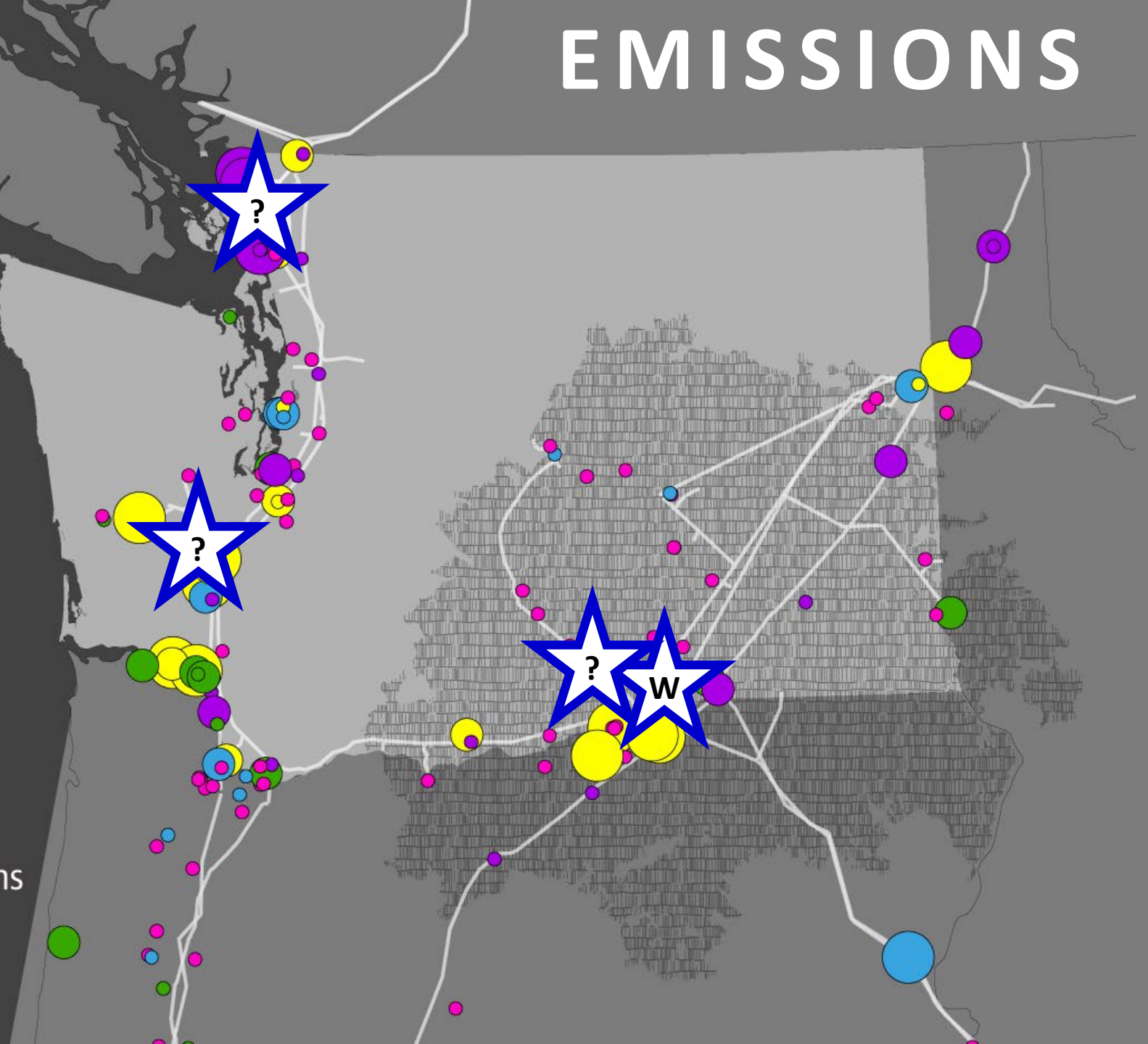
VE: 10x

Burns et al. (2010)

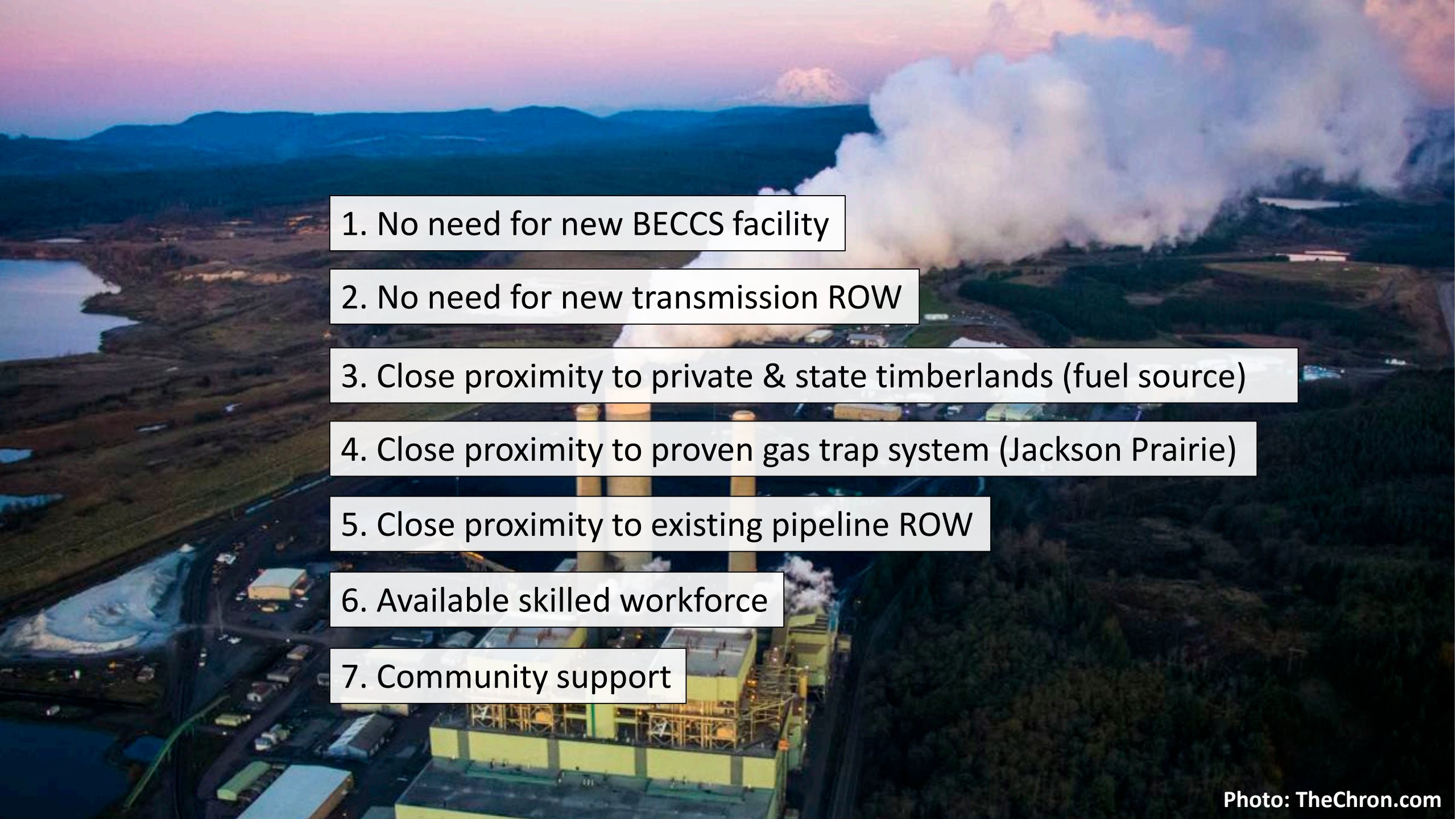


# EMISSIONS

- less than 100,000 metric tons per year
- 100,000–500,000 metric tons per year
- more than 500,000 metric tons per year
- / Pipelines (crude oil, natural gas, petroleum, etc.)
- Extent of the Columbia River Basalt Group
- Paper and pulp mills
- Power plants
- Other (agricultural, tech, etc.)
- Refineries, chemical productions
- Metal, mineral, and cement manufacturing







1. No need for new BECCS facility

2. No need for new transmission ROW

3. Close proximity to private & state timberlands (fuel source)

4. Close proximity to proven gas trap system (Jackson Prairie)

5. Close proximity to existing pipeline ROW

6. Available skilled workforce

7. Community support



Basalt should be a special case for UIC Class VI



Assistance with stratigraphic test wells is essential



# Environmental justice review is state-mandated

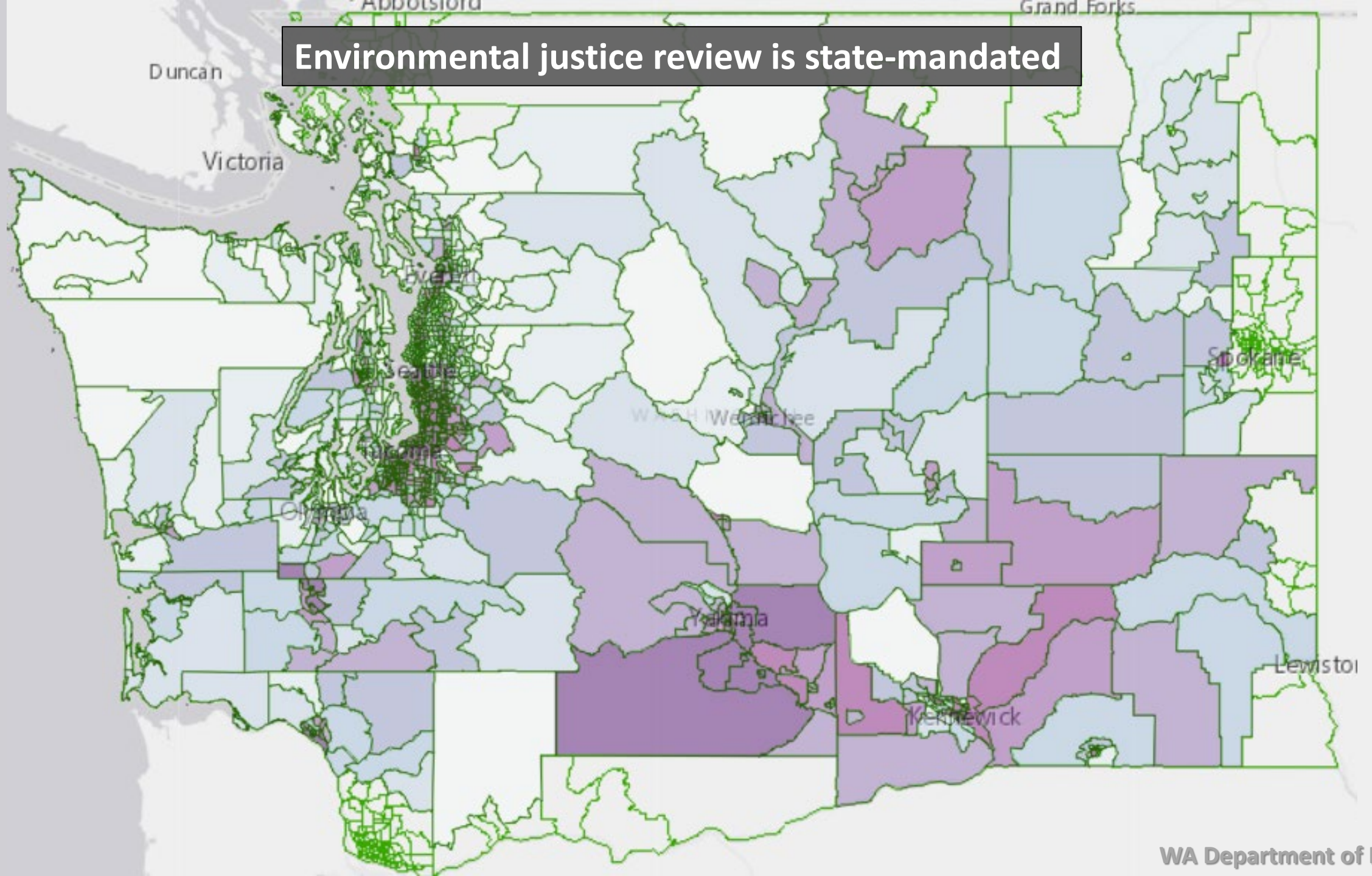






Photo: Carolyn Kelly, DNR





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[dnr.wa.gov/geologic-carbon-sequestration](https://dnr.wa.gov/geologic-carbon-sequestration)

Photo: Carolyn Kelly, DNR







# Where Are Possible Storage Sites?



## • Potential Basins

### Olympic Peninsula

-  Rejected
- Not near / Tribal Lands

### Willapa Hills

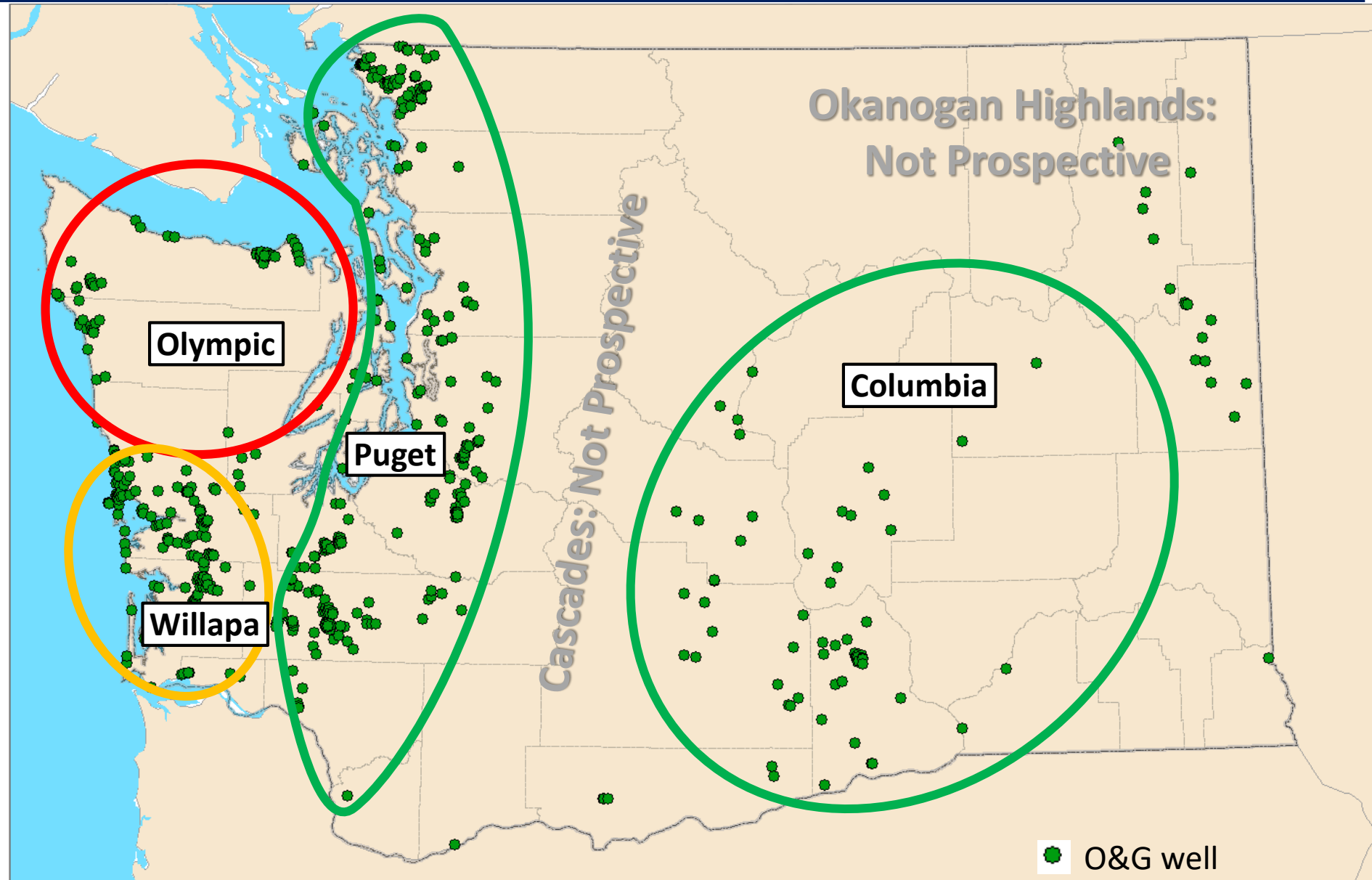
- Minimal pipeline infrastrx
- Minor sources

### Puget Lowlands

- Major sources
- Existing pipeline infrastrx
- Heaviest urban development

### Columbia Basin

- Basalt – permanent storage
- Significant sources



## Refinery and natural gas power plant importance



Photo: Marathon