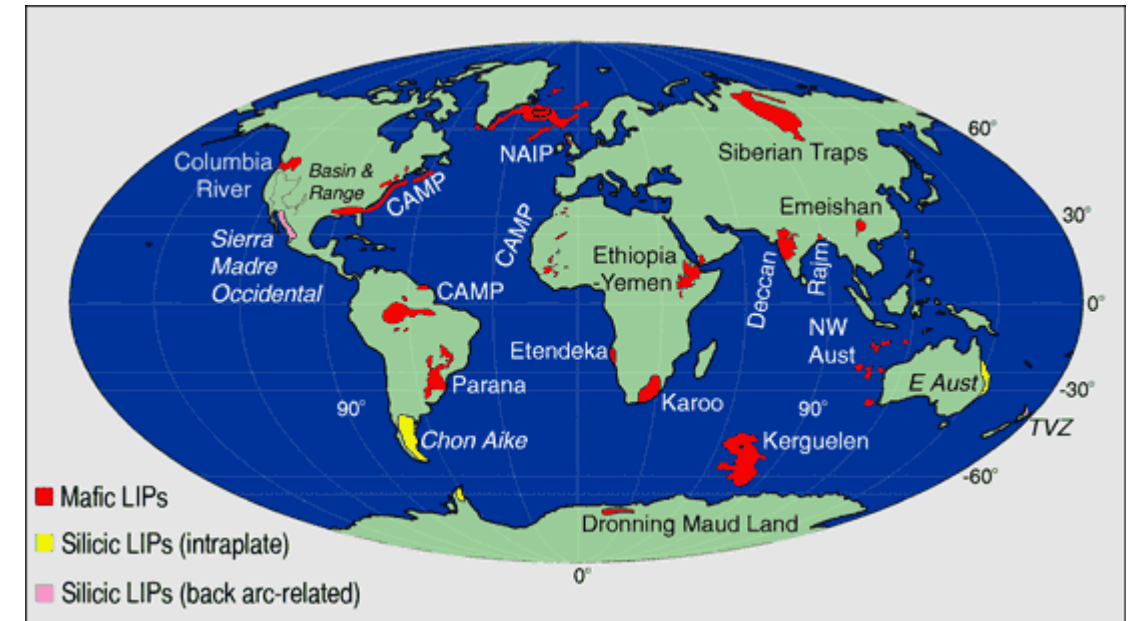
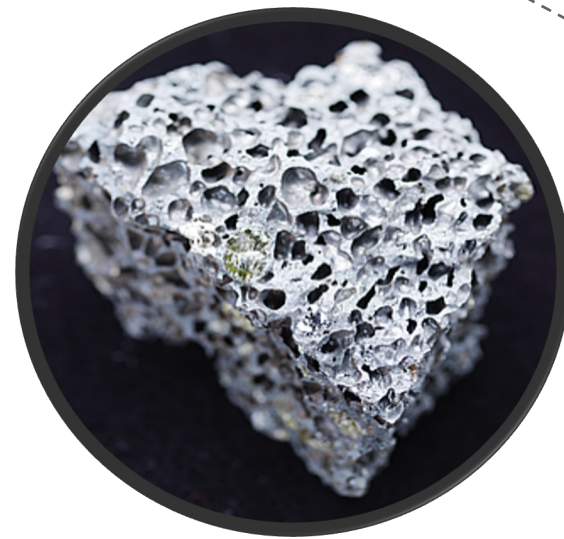


# Why Sequester Carbon in Basalts?

## Favorable Attributes of Basalt

- Highly reactive with supercritical CO<sub>2</sub>
- Self-sealing for leakage scenarios
- Common rock type with worldwide distribution
- Flood Basalt = large volumetric thickness



Major basalt formations can be found on every continent, offshore, and in the deep sea.

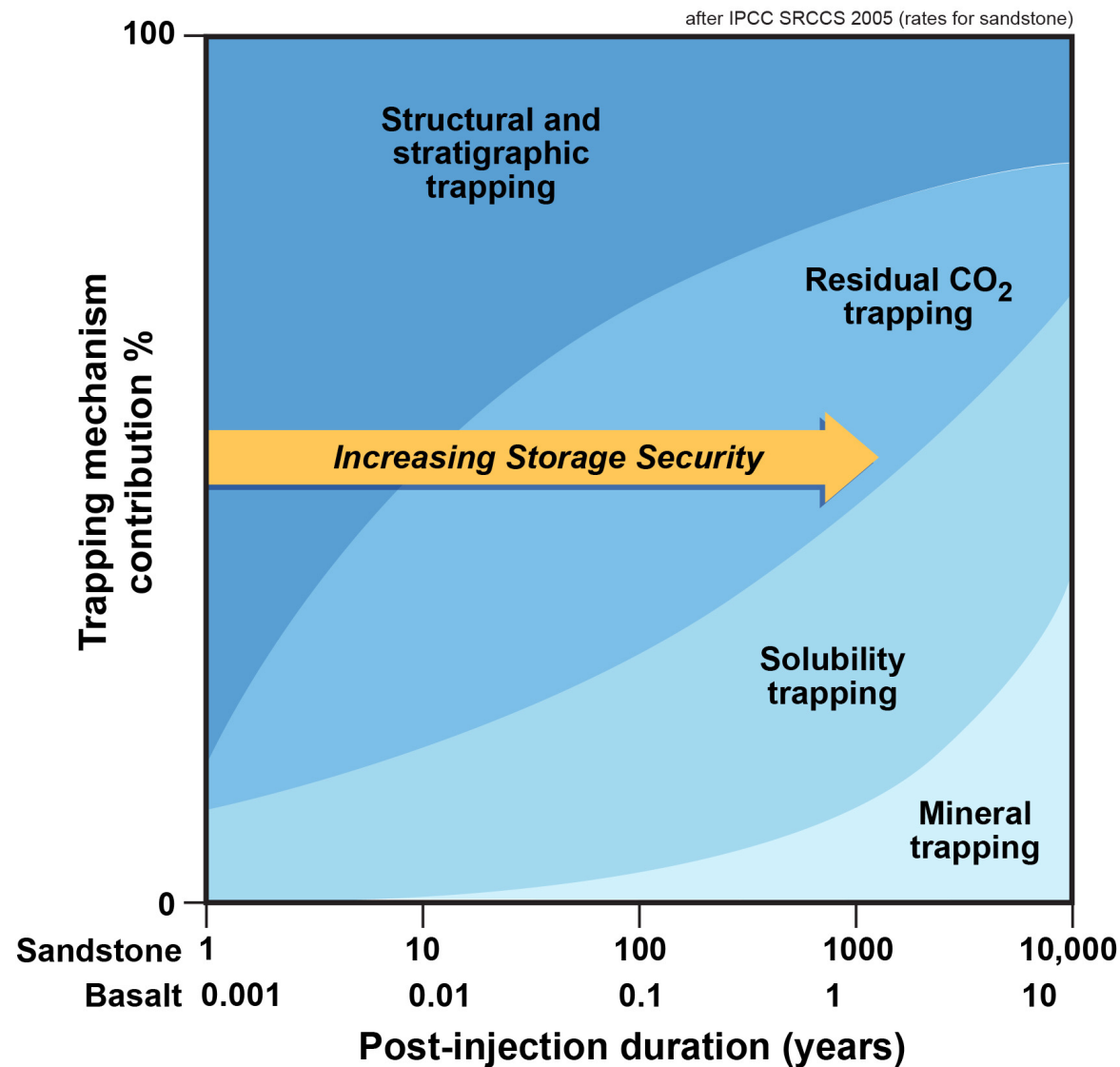


McGrail, Schaef et al 2006, "Potential for CO<sub>2</sub> Sequestration in Flood Basalts", Journal of Geophysical Research, Vol 111, B12201.

Continental flood basalts are layered structures that serve as regional aquifers in parts of the world.

# New interest after recently published Wallula results and Carbfix outcomes

Evolution of CO<sub>2</sub> trapping mechanisms in sandstone and basalt reservoirs

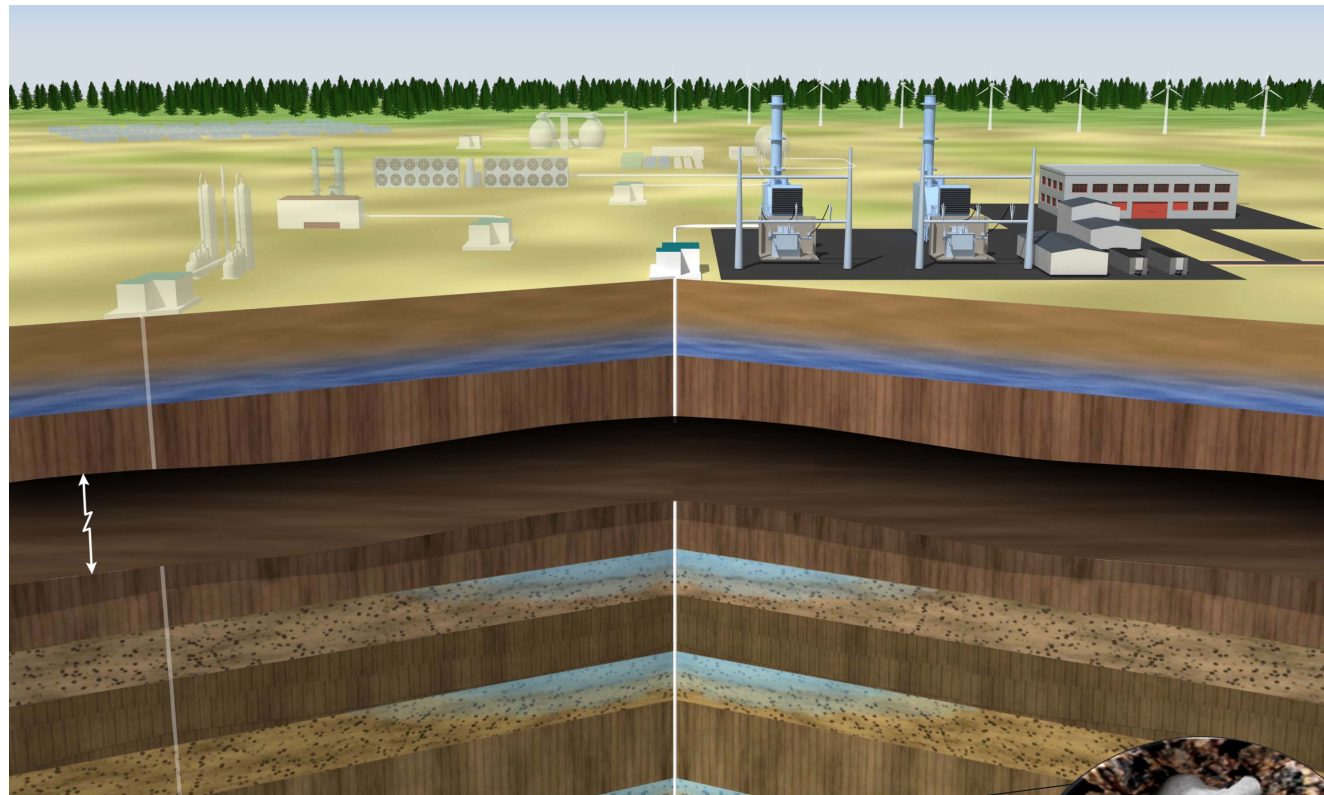


Basalts convert CO<sub>2</sub> to solid minerals much more rapidly than other rock types. Mineralized CO<sub>2</sub> is immobile and poses **no risk of leakage.**

Industry needs regulatory and technical support for **Class VI** permits that account for these risk reductions.



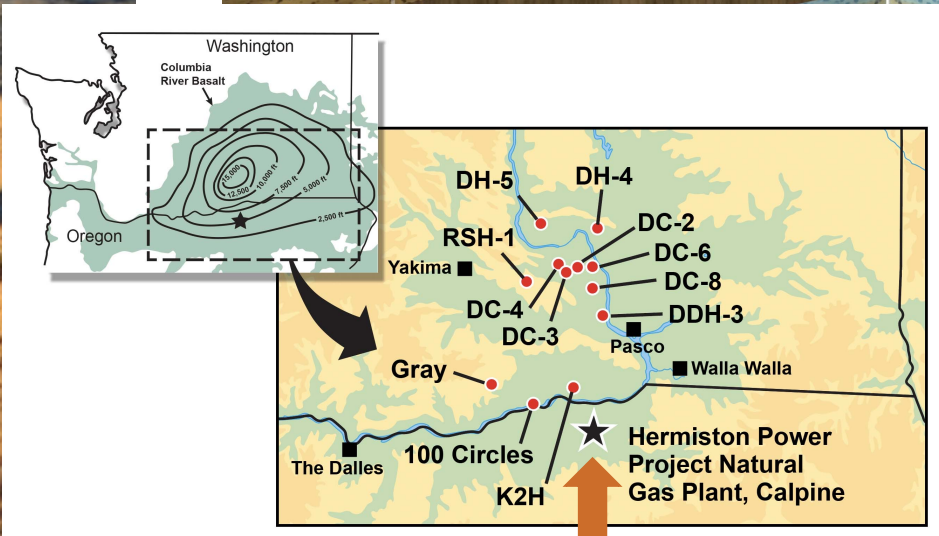
# CarbonSAFE HERO Phase II Provides an Opportunity to Gain Insights into Deep Layered Basalts for CO<sub>2</sub> Storage



**HERO (University of Wyoming and PNNL) represents the first ever basalt-hosted CO<sub>2</sub> storage hub in the nation and the first commercial CO<sub>2</sub> storage development project in the Pacific Northwest.**

Scope includes:

- Drill stratigraphic test well at the Hermiston Power Project (Hermiston, Oregon)
- Engage community, industry, governmental and regulatory stakeholders early and often
- Full characterization suite including wireline logging and core testing
- Incorporate stratigraphic data into regional geologic model
- **Complete reservoir simulation to provide uncertainty-bounded estimates of regional capacity, injection rates and mineralization rates**
- Evaluate storage complex sustainability for commercial injection volumes and timescales
- Identify priority areas and options for acquisition of new datasets to resolve key uncertainties advancing to Phase III



## Opportunities:

- Regulatory and community stakeholder engagement
- Establishing a repository (Reactive Rock Database) and access to samples, and reservoir data (all informal at the moment)
- Developing new laboratory testing methodologies to assess mineral carbonation