IGS Petroleum System Research (WSRP)

Basin Framework and Petroleum System
- Configuration of Reservoirs, Seals, Source Rocks, and Traps

Reservoir Presence and Effectiveness
- Reservoir Geology, Field Production Data, Outcrop Analogs

Geochemistry of Gas and Fluids
- Origins of oil and gas

Source Rock Evaluation
- Distribution of potential source rocks and their hydrocarbon generating capabilities.
Western Snake River Plain (WSRP)

Weiser Embayment

2D Seismic Line
- Stratigraphic Well
- Oil&Gas Well Sample
- WSRP Sediments
- Syn-Rift Outcrops

20 miles

Trendwell Prospect
Exact Location not shown

Vale
Harmon Field
Payette
Willow Field
Hamilton Field

Emmett
Central Basin High
Caldwell
Eagle

Ore-Ida Graben
Syn-Rift Reservoir Analogs

A

Shoreface

Deltaic

Syn-Rift Fluvial

Photo shown in Figure 3B

B

Deltaic

Structurally Tilted Fluvial Strata
(Thickness is about 150 ft)

Syn-Rift Unconformity
Oil and Gas Geochemistry

Biomarkers and isotopic signatures used to assess the origins of oil and gas.

- LCH reservoirs contain wet gas, while UCH reservoirs are a mix of wet and dry gas.
- Dry gas has a biogenic origin while wet gas has a thermogenic origin.
- Maturation temperature of wet gas was around 120 degrees Fahrenheit. Equivalent to a depth of 5-8 thousand feet.
- Secondary cracking of oil to produce gas not suggested.

Kauffman 1-9 LT
Oil sample
Chromatogram

Oil sample depleted in n-alkanes above $C_{31}$
Condensates depleted in n-alkanes above $C_{17}$
Oil and Gas Geochemistry

Biomarker indices suggest hydrocarbons largely sourced from terrigenous organic material that accumulated within a slightly oxidizing environment.

Results are consistent with middle Miocene sediments associated with the Lower Chalk Hills, Payette, or Columbia River Basalts.
Future Plans

Wrap-up oil geo-chemistry work and publish findings.

Interpret additional 2D seismic data (+300 miles).
Construct maps of key surfaces, faults, and major facies associations. Covert data into a form that can utilized in 3d models of the subsurface (applicable to O&G, GW, Geothermal, CO₂ Sequestration, etc.)

Use collected data to basin model and assess hydrocarbon potential.

Conduct reconnaissance in South-Central Idaho with regards to potential source rocks such as the Phosphoria and Elko Formations.