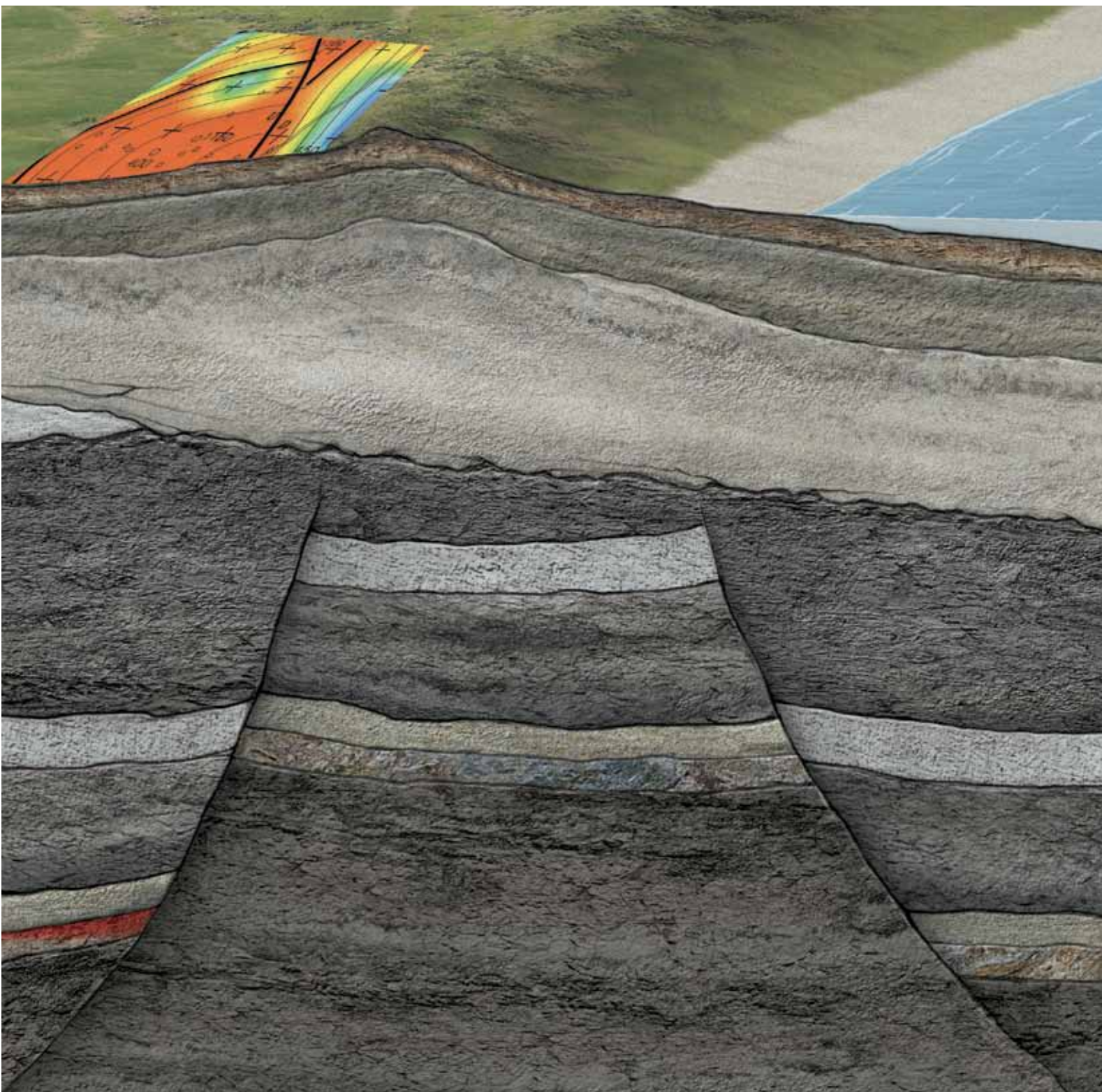




AMPLIFIED  
GEOCHEMICAL  
IMAGING, LLC

*Amplified Geochemical  
Imaging<sup>SM</sup> Technology*





# Amplified Geochemical Imaging<sup>SM</sup> Technology

Amplified Geochemical Imaging<sup>SM</sup> technology is an advanced geoscience tool that enables direct mapping of subsurface hydrocarbon charge. It is used to analyze data collected by AGI's unique and highly sensitive passive diffusion sampling module. Compared to traditional surface geochemical techniques, this proprietary technology incorporates the combined advantages of an improved sampler design, higher sensitivity (ppb to ppt), robust data set, and multivariate statistical interpretation.

AGI's Amplified Geochemical Imaging<sup>SM</sup> technology has been used effectively in more than 130 basins in more than 70 countries, in all terrains including desert, jungle, plains and tundra, and offshore from transition zone to deep ocean with >90% accuracy.

## AGI's Proprietary Expertise in Data Analysis and Interpretation



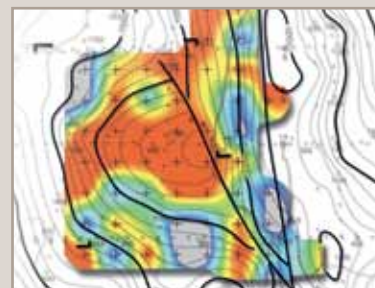
### Data Analysis

- Uses analytical compound standards
- Broad range of compounds: ethane to phytane (C<sub>2</sub> – C<sub>20</sub>) Aliphatics / Aromatics / NSO compounds



### Interpretation & Integration

- Examination of chemical "fingerprints"
- Advanced statistical interpretation
- Integration of geochemical data with geological and geophysical data



### Final Report

Results are summarized and reported in a professional package that includes:

- QA/QC summary
- Geochemical modeling
- Contoured probability and compound maps
- Summary & conclusions



# Applications

AGI Universal Samplers can be deployed onshore in all geographies and climates as well as in swamps and shallow water.

## Pre-License bidding

- Evaluate source/charge/seal
- Reduce bid risks related to charge

## Frontier

- Quickly and efficiently evaluate very large blocks
- Validate petroleum systems
- Decide to keep or drop blocks
- Define geochemical leads
- Focus a seismic program to hydrocarbon prone areas

## Exploration

- Prioritize prospects
- Investigate charge in structural and stratigraphic traps
- Define charged channel sands
- Help identify drilling locations

## Field development

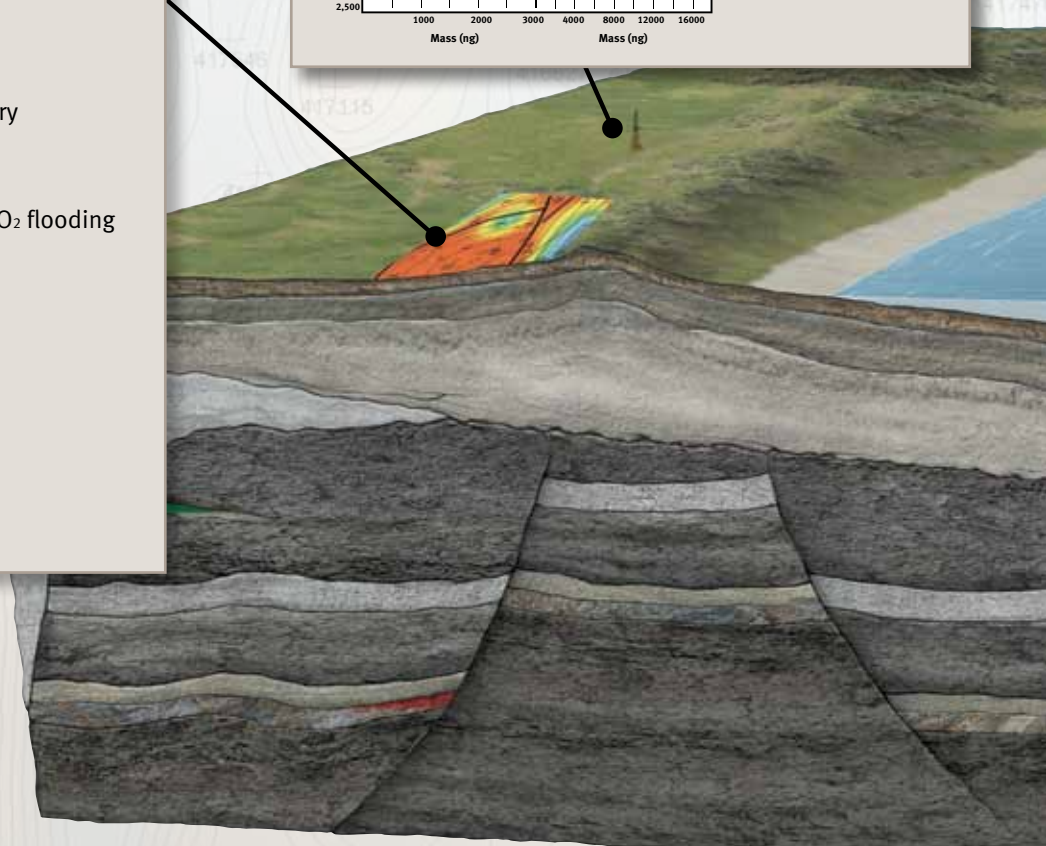
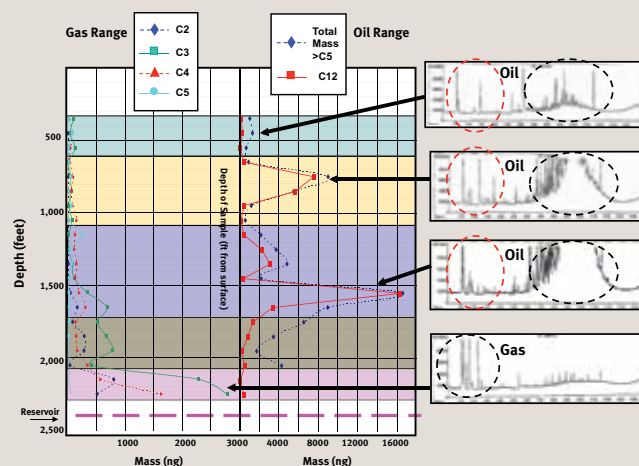
- Define areal extent of producing fields
- Locate potential areas for secondary recovery
- Help to increase production
- Build reserves by finding by-passed pay
- Improve the effective design of water and CO<sub>2</sub> flooding



Sampler insertion into the ground

## Downhole Geochemical Logging

- Hydrocarbon Phase Identification
- Compartmentalization & Seal Rock Integrity
- Identify By-Passed Pay Zones (possibly increasing potential reserve estimates)
- Reservoir Fluid Properties
- Stratigraphic Correlations



### Slick Sampling

- Direct sampling of petroleum slicks and seeps
- Easy to deploy samplers in convenient kit form
- Partner services provide near-real time slick mapping

### Macroseeps

- Sample seabed features (faults cutting the surface, pockmarks, etc.)
- Validate petroleum systems



Photo courtesy of SAPETRO



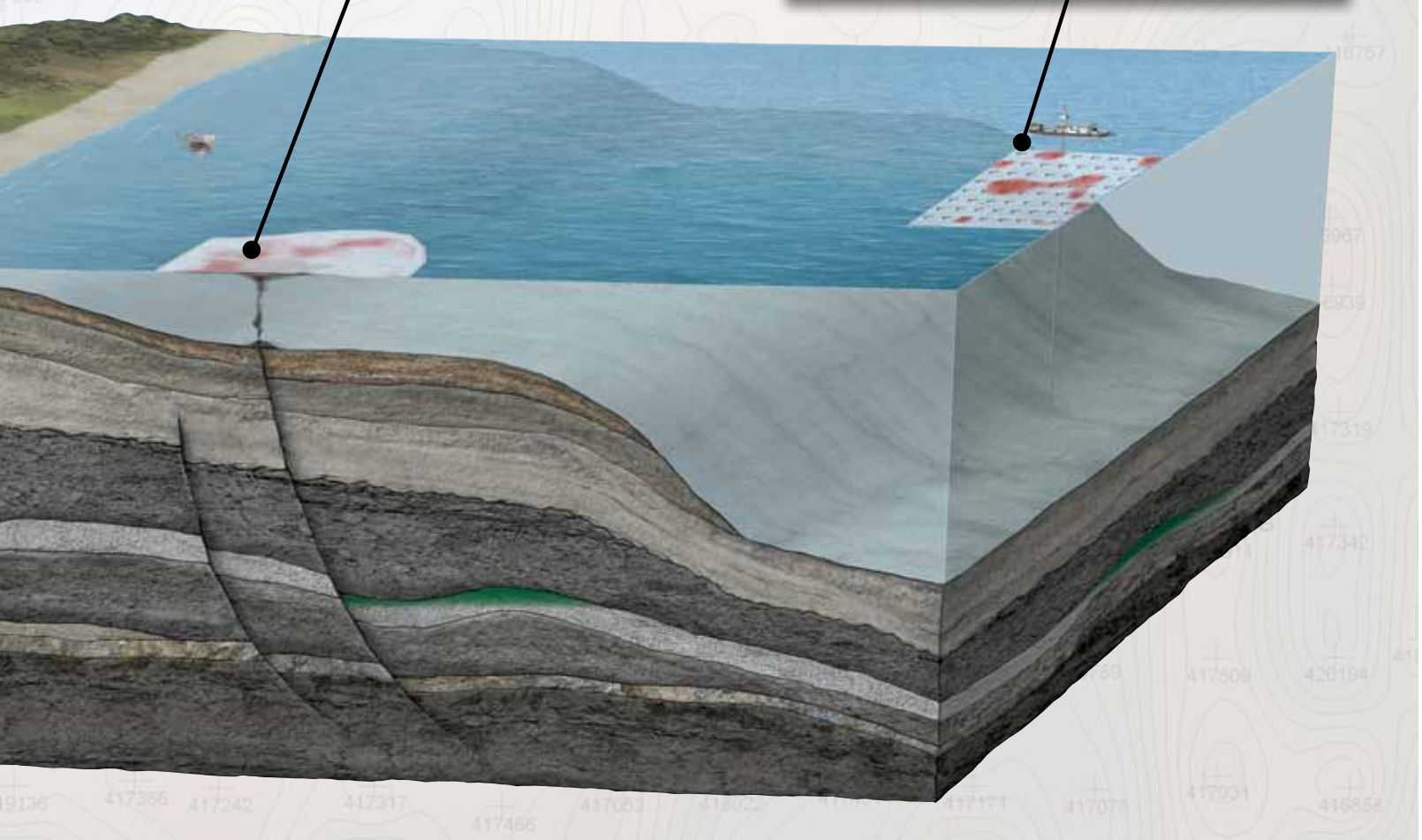
Casting the slick sampler into the water

### Core Sampling

- Complement other core analyses
- Use as cores are collected or on frozen or stored cores from previous excursions
- Directly measure actively migrating hydrocarbons
- Define petroleum phases: gas, condensate, oil
- Delineate type and source
- Can define reservoirs, field limits and areas of missed pay depending on survey design and sufficient sampling resolution



Subcropping the core section





## AGI Universal Samplers Enable Accurate, Sensitive Passive Sampling

### Engineered sorbents

- Consistent sampling medium
- Collects a wide variety of volatile and semi-volatile organic compounds ( $C_2 - C_{20}$ ) allowing differentiation of petroleum phase types (gas, condensate, oil)
- Multiple samplers within each module allow for back-up or duplicate analysis

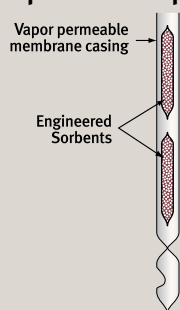
### Protect sample integrity

- Unique identification number to ensure rigorous QA/QC and accurate sample tracking
- Highly durable collector design: Chemically-inert, waterproof, vapor permeable

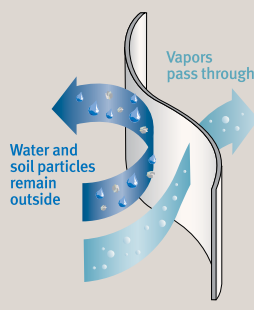
### Allow passive, sorbent-based, time-integrated sampling

- Smoothes temporal variations in signal due to barometric pressure, rainfall, and temperature variation.
- Minimizes near-surface variability
- Avoids potential errors inherent in instantaneous sampling

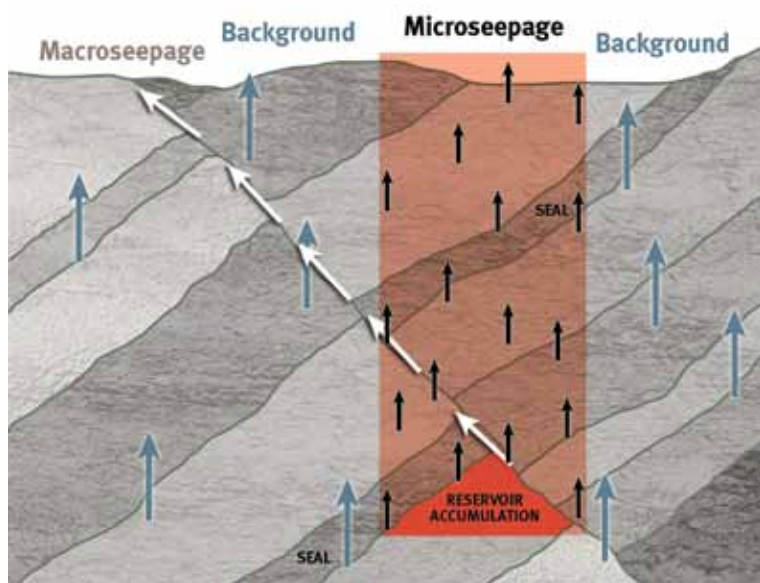
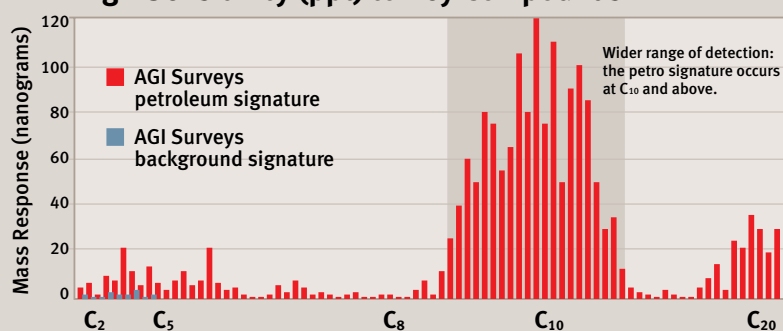
### AGI passive sampler



### ePTFE Membrane



### High Sensitivity (ppt) to Key Compounds



## Direct Mapping of Subsurface Charge

Vertical and non-vertical hydrocarbon migration both occur routinely. AGI's Amplified Geochemical Imaging<sup>SM</sup> technology can chemically differentiate hydrocarbons migrating along fault lines (macroseepage) and background hydrocarbons from those migrating vertically via microseepage.

The AGI Universal Sampler, with its vapor-permeable membrane, proprietary sorbent technology and passive deployment, enables the capture of trace level hydrocarbon microseepage signals from interstitial pore space gases.

Building on this proprietary collector, AGI's Amplified Geochemical Imaging<sup>SM</sup> technology combines sensitive GC/MS analysis and advanced mathematical and statistical modeling techniques to isolate the relevant microseepage and produce a map of hydrocarbon charge.

### **AGI Surveys Products Family**

#### **AGI Surveys for Minerals:**

Explore for buried mineral deposits of gold, silver, copper, lead and zinc and assess diamond-bearing kimberlite pipes.

#### **AGI Surveys for Environmental:**

Site assessments, vapor intrusion investigations, ground and surface water sampling, long-term site monitoring and pipeline safety testing.

**If you would like to know more, please contact us.  
We would be happy to assist you.**

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