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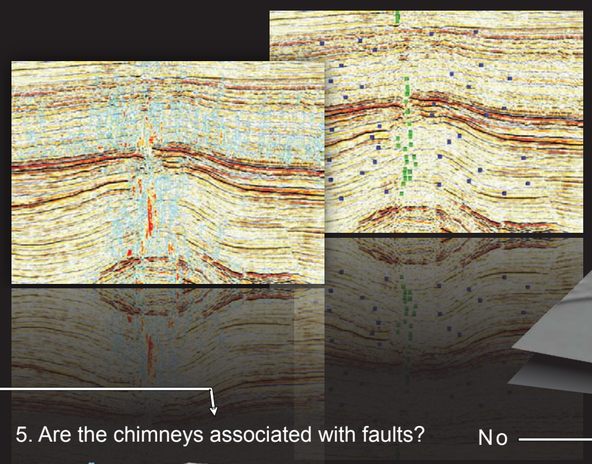
# Workflow for Prospect Risking using HC-Chimneys

1. Are chimneys observed in my data set?
Gas (and oil) chimneys are observed in seismic data as vertical zones of low amplitude, chaotic data. Although chimneys are not always obvious, more than 90% of Tertiary and Mesozoic basins evaluated have associated chimneys. Apart from de-risking prospects, chimney analysis is routinely used to detect abnormal pressures and source rock expulsions, to predict zones of heavy tar and to predict geo-hazards.

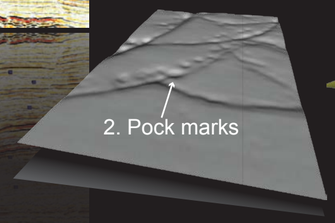
Yes →

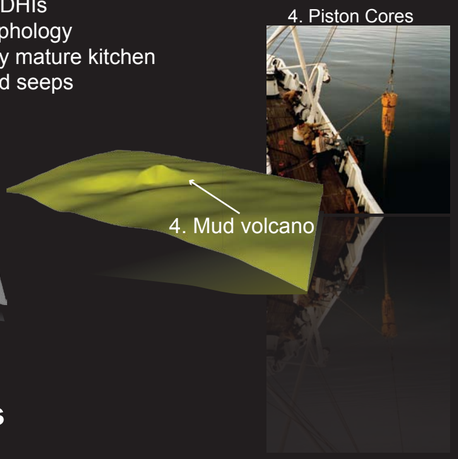
2. Apply chimney processing to seismic data to highlight vertical HC migration.
Single attributes, such as coherency may show chimneys, but are not unique indicators. Chimney processing uses multiple directional attributes combined via a neural network to highlight the chimneys. Expected chimneys are picked in the data, and used to train the neural network to find similar features. The result is a ChimneyCube.



3. Are the results of my chimney processing valid?
Not all vertical discontinuities in seismic data are related to HC migration. Additional criteria are necessary to validate the results. They include:

1. Link to shallow DHIs
2. Pock mark morphology
3. Link to thermally mature kitchen
4. Link to observed seeps



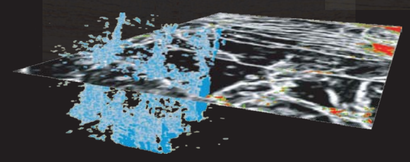

4. Are the observed chimneys directly linked to my trap? Yes →

No ↓

Yes ←

5. Are the chimneys associated with faults?

No →



## Fault Traps

5a. How do the chimneys relate to the trap?

## Top Seal Traps

5b. What is the morphology of the chimneys?

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Chimneys not present or not linked to trap

**Charge-risk Trap**

Low probability of vertical charge. Lateral charge necessary.

Chimneys adjacent or below

**Fault Seal Trap**

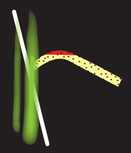
Chimneys stop in overlying seal. High Integrity Trap (HIT). Often form pressure seals.

Chimneys at crest

**Fault Leak Trap**

Chimneys leak to shallow sands or surface. Low Integrity Trap (LIT).

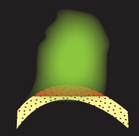
Chimneys on flank



**Fault Flank Trap**

High Integrity Trap (HIT). Often filled to spill.

Gas Cloud



**Gas Cloud Trap**

Moderate to high integrity trap. High probability of success.

Pipe with pockmarks or DHIs

**Blowout Pipe Trap**

Extensive seal risk when active.

Pipe with radial fracturing

**Mud Volcano Trap**

Extensive seal risk when active, but is self healing.