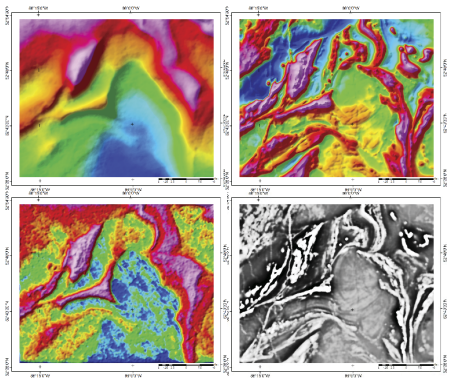
Xcalibur Smart Mapping, Hydrogen Exploration

Xcalibur Smart Mapping is a global leader in airborne exploration for natural hydrogen.

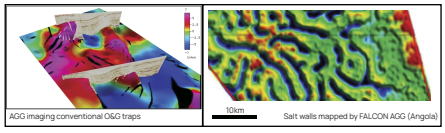
Xcalibur has acquired more than **240 000 linear km of Airborne Falcon® AGG** data over the last 3 years in support of natural Hydrogen exploration.

Leveraging our extensive experience and unique technologies, we have supported explorers such as a **Prominent American based explorer, Hytierra, Koloma** and **Gold Hydrogen** in their exploration programs. Hydrogen exploration combines the fields of hydrocarbon and mineral exploration. Xcalibur brings decades of expertise in data acquisition, interpretation, and modelling in both areas.



Gravity (top) and vertical gravity gradient (bottom)

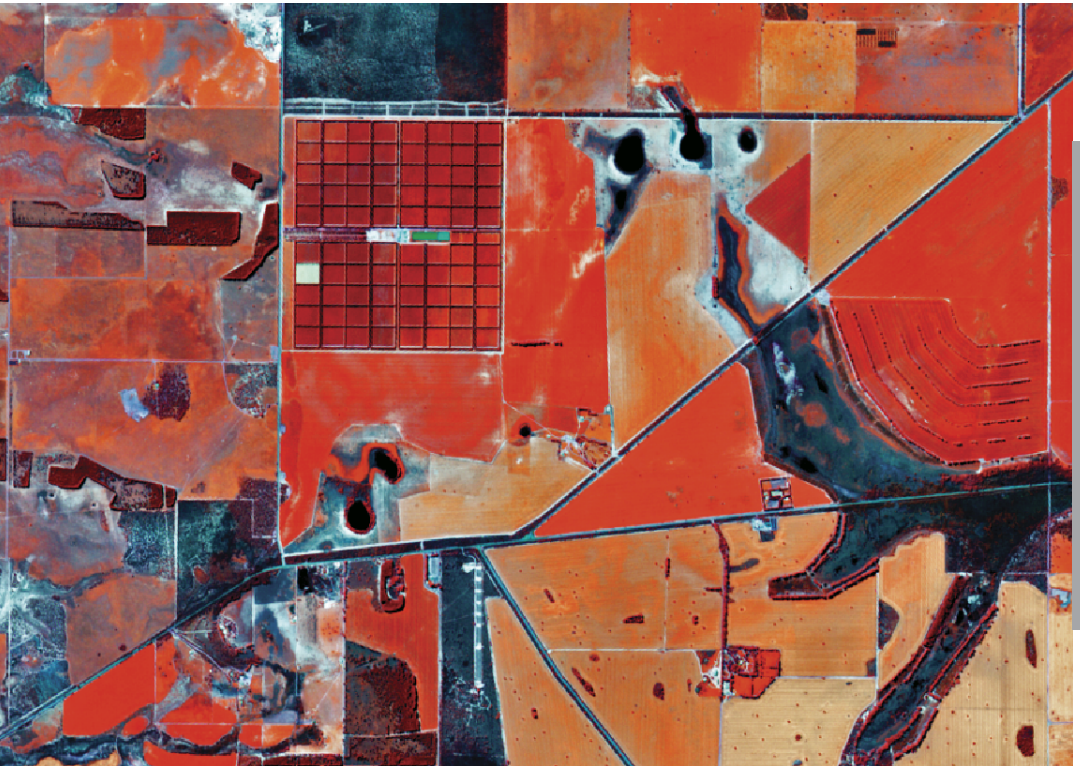
Magnetics (top) and vertical magnetic gradient (bottom)



Natural hydrogen is formed in the subsurface via multiple processes. The best understood processes are Serpentinization and Radiolysis.
Serpentinization is an alteration process of mafic/ultramafic lithologies resulting from interaction with water at specific pressures and temperatures.

Ultramafic rocks are generally high density and can be mapped to great depth with **FALCON® AGG** with high resolution gravity. **FALCON® AGG** and magnetic data will also image radiogenic granites that generate hydrogen and helium through radiolysis. **FALCON® AGG** and magnetic data will map the faults and fractures that act as conduits for both processes, allowing water influx and subsequent hydrogen generation and migration.

For hydrogen to accumulate in the subsurface, impermeable layers such as shales and salt are required to impede its escape to the surface. **FALCON® AGG** is ideal for mapping these formations and structures, and has demonstrated this capability numerous times in conventional hydrocarbon exploration.

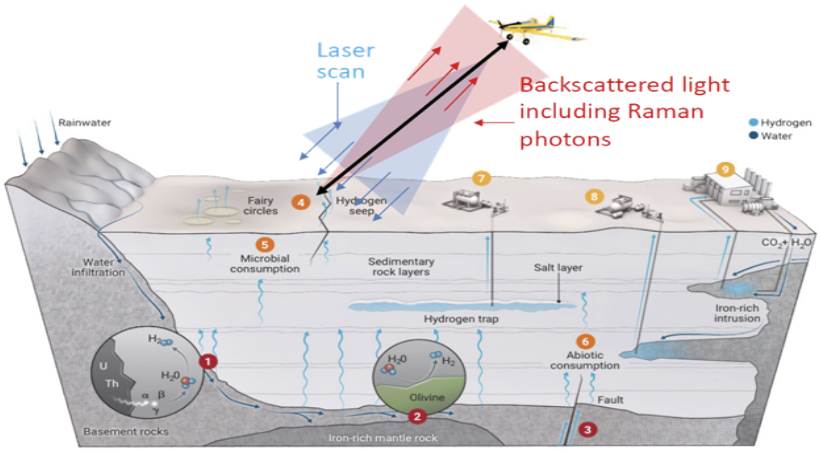


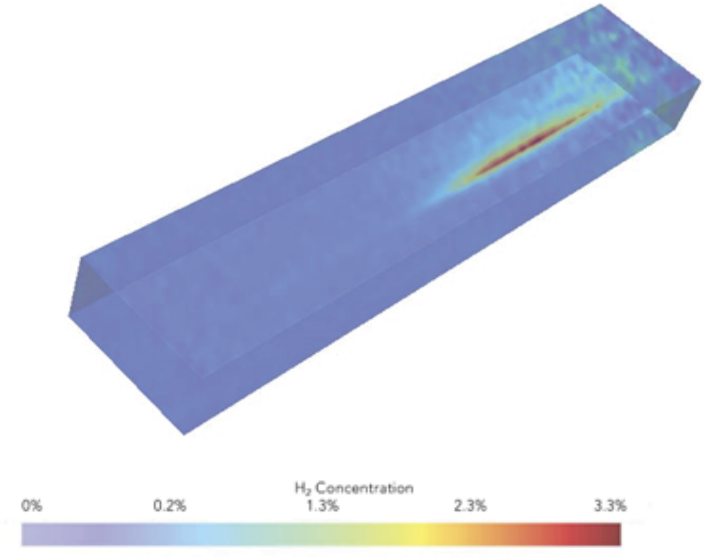
Our expertise and unique airborne geophysical solutions have the capability identifying hydrogen generation, migration, and accumulation for commercial extraction

Xcalibur Smart Mapping and **Curtin University of Technology** in Perth, Australia, are collaborating to develop technology for the direct detection of atmospheric hydrogen from survey aircraft. This technology utilizes Raman Scattering Spectroscopy, the only known method to remotely and safely detect atmospheric hydrogen and various other gases.

The process involves using a laser to excite a volume of air near the Earth's surface, generating scattered light with a characteristic vibrational energy from each molecule. The Raman scattered light spectrum is then measured with a spectrometer to determine the concentration of hydrogen and other gases present.

When deployed with **FALCON® AGG** , **H-MAS** offers a unique and powerful capability to detect geological hydrogen at the surface while mapping subsurface lithology and structures using **FALCON® AGG** and Magnetics.





H-MAS provides a unique capability to remotely monitor atmospheric hydrogen leaks from pipelines and other hydrogen infrastructure.

Xcalibur SMART MAPPING

Curtin University