



## TERRARAD TECH: HIGH RESOLUTION ENVIRONMENTAL MONITORING

### Problem – Challenge

Climate change is causing a scarcity of fresh water, melting glaciers, and changes to the global water cycle. Changes are occurring faster than the technological developments required to accurately monitor them. Impacts are being seen from drying farms, melting glaciers, increasing wildfires, to coastal cities experiencing sea level rise. Satellite-based remote sensing can help to quantify and monitor our changing planet, but there is a limit to what can be done from 500 km away. Additionally, ground-based single-point sensors can only provide a limited amount of data with their inability to capture spatial information. How can we achieve high resolution data of farms, glaciers, wildfires, and coastal infrastructures that are directly sensitive to water?

### Solution

The answer is a drone-borne instrument that measures microwaves naturally emitted from the earth. The microwave remote sensing group at the Swiss Federal Institute for Forest, Snow, and Landscape Research (WSL) has developed, and patented, a compact microwave 'radiometer' capable of high-resolution drone-borne mapping of water. The specific 'L-band' electromagnetic frequency is highly sensitive to liquid water, and can detect water deep within soil, snow, and ice. Use cases of the sensor include: optimizing irrigation and yield prediction for agriculture, monitoring glacier hydrology, mapping and risk assessment for wildfire, and identification of leaks within levees and dams.

TerraRad Tech AG, the first ever spin-off from WSL will commercialize the drone-borne microwave radiometer. It uses the same technology so far only used on large ground-based radiometers and on NASA and ESA satellites (SMAP and SMOS). With a broad range of applications and use cases, TerraRad Tech sees the AgriTech market as the highest potential and highest value business case. In arid regions such as Australia, the Western US, Israel, and high-value irrigated crops globally, optimal use of irrigation and increased yield-per-area will be required to feed the growing population.

