



GroundWATCH

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PREDICT FUTURE PROBLEMS BY LOOKING AT THE PAST

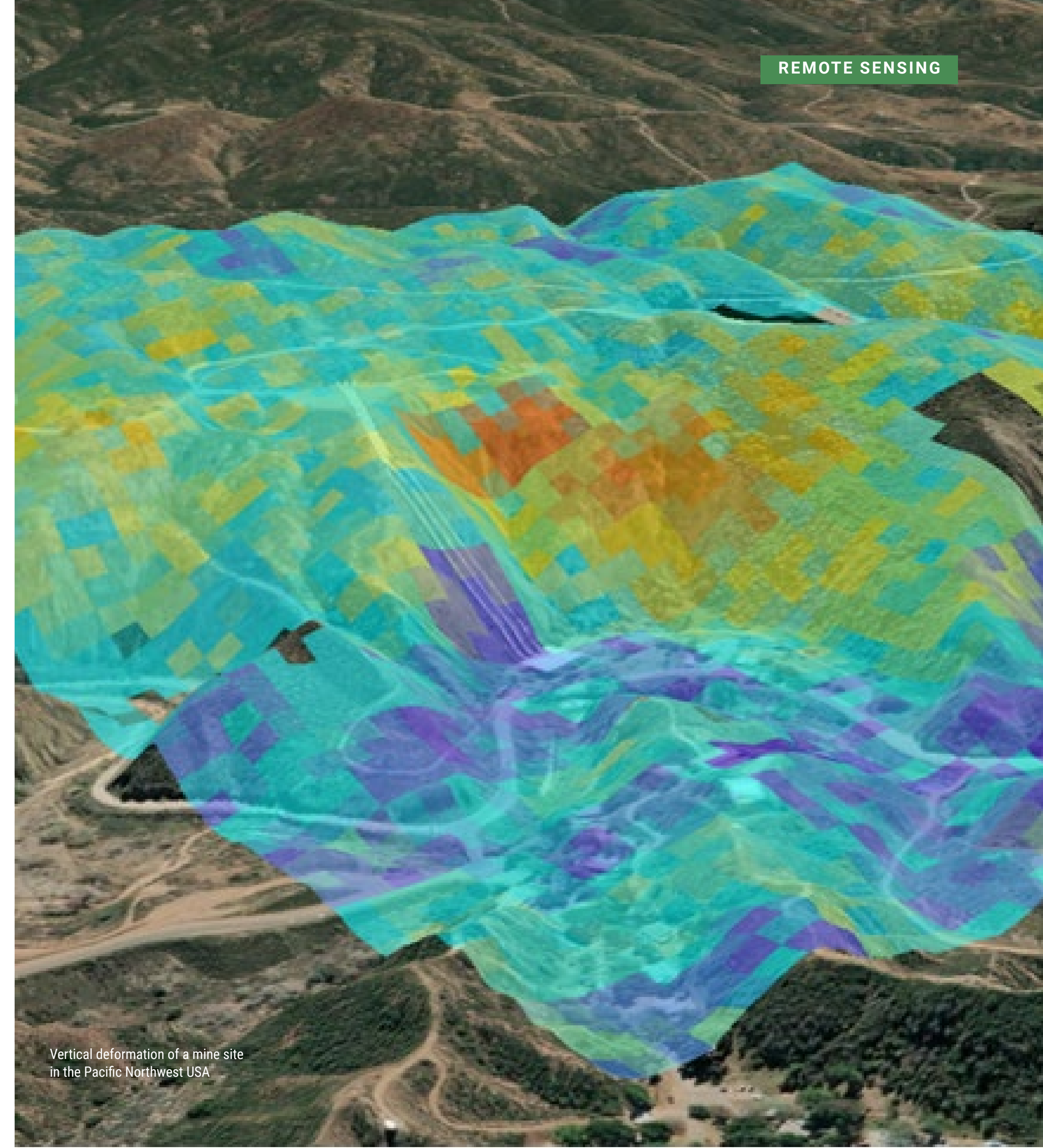
How do we measure a change that cannot be easily seen at scale? GroundWATCH can provide the necessary information to plan for future events by looking at the past. Landslides, sediment build-up, mine closures, permafrost thaw and dewatering activities can all cause surface deformation impacting your infrastructure. GroundWATCH can help predict, prevent and protect for a safer future.

WHAT IS THE BENEFIT?

We leverage satellite imagery to detect surface elevation changes down to the sub-millimeter scale. Lateral movement can also be detected depending upon site location. With a global historical database of imagery collected from as far back as 2015, our ground subsidence measurements are not limited by cloud, smoke, vegetation or snow. We are capable of looking at landscape coverage at a 20m x 20m resolution down to 1m x 1m resolution to provide you with a better understanding of the ground beneath your project sites.

< 1
mm precision of
vertical movement

12
Get ground deformation
updates of your entire project
every 12 days



Vertical deformation of a mine site in the Pacific Northwest USA

HOW DOES IT WORK?

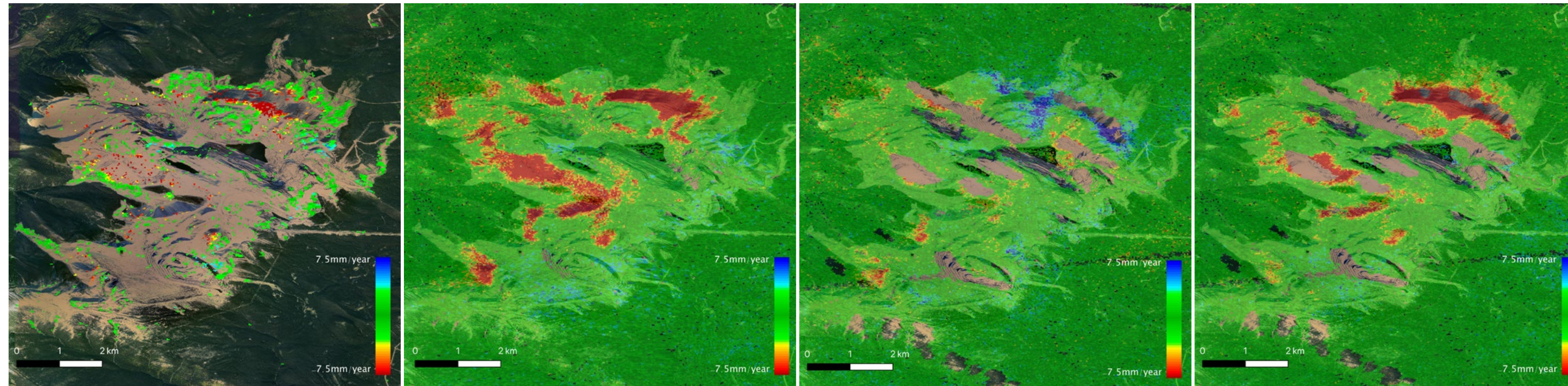
GroundWATCH uses Interferometric Synthetic Aperture Radar (InSAR) data to scan the ground at various phases. A change in transmitted electromagnetic wave travel time represents a phase shift. This translates to accurate and precise surface movement over time.

VALUE

GroundWATCH uses proprietary processing to extract nearly all signals from InSAR data. In 2020, we used this technology to identify surface subsidence occurring at a mine site. Using GroundWATCH's unique technology, we can identify subsidence throughout the entire mine site (above right). Conventional InSAR practices only provide a small portion of ground subsidence coverage, whereas GroundWATCH provides full coverage.

RESULTS

GroundWATCH can identify the full extent of deformation and how infrastructure is affected.



Conventional InSAR
techniques only provide sporadic coverage of surface movement changes

Total Movement
Surface movement in three-dimensions in contrast to Conventional InSAR

Lateral Movement
Surface lateral movement in East-West direction

Vertical Movement
Vertical surface movement in the Up-Down direction

GROUND MOVEMENT APPLICATIONS

Railways	Identify and monitor ground movement and subsidence that could delay or halt operations
Mining	Monitor ground movement including subsidence and tailings stability
Permafrost	Identify and monitor thermokarst hazards (including wash-out frequencies)
Pipelines	Delineate ground deformation that could impact pipelines
Glaciers	Track glacial movement, velocity, and volume changes
Oil & Gas, Geothermal or Groundwater abstraction	Estimate subsidence caused by consolidation due to fluid withdrawals and heave caused by injection
Coastal Erosion and Accretion	Detection of surface movement with millimeter scale precision.



Detailed accuracy – Vertical movement of an individual 20m x 20m pixel every 12 days from 2016 to current

RELATED ITEMS

[Marine Arctic Ecosystem Study](#)

CONTACT US

Send us an email at remotesensing@stantec.com to learn more about remote sensing and how it relates to ground deformation.

Our GroundWATCH Remote Sensing experts:

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