

# We're sensing a change

**SwRI**<sup>®</sup>

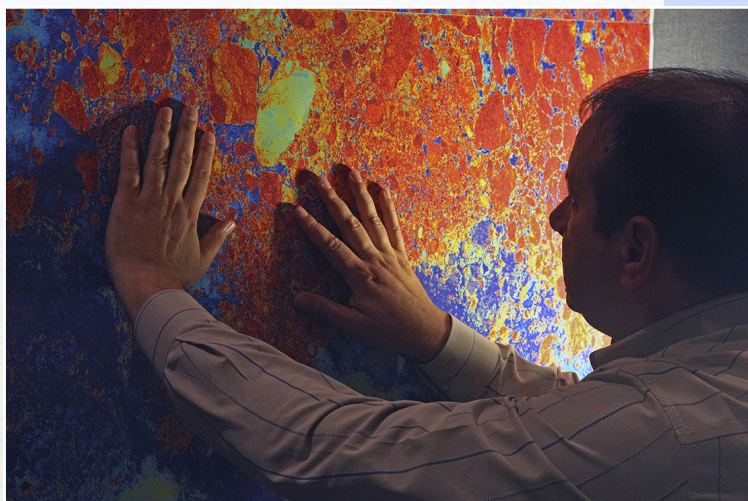


# Earth's landscape is changing

The radar and optical satellite remote-sensing technologies offered by Southwest Research Institute® help define impacts of climate change in cold and high altitude regions.

## WE QUANTIFY WORLDWIDE IMPACTS

Founded in 1947, SwRI is an independent, nonprofit applied research and development organization. Using geomatics techniques, we can help study locations that are difficult or impossible to reach due to frigid climate, high altitude, or rugged terrain. We have quantified changes to Antarctic sea ice and permafrost regions in the Arctic tundra and European mountains, while our risk assessments have estimated hazards from thawing permafrost.



Antarctic sea ice characterization using surface ice measurements and radar satellite imagery.

## REMOTE-SENSING CAPABILITIES

- Satellite radar interferometry (InSAR)
- Multispectral Data Displacement Analysis (MDDA)
- Satellite radar polarimetry
- Passive microwave for snow and ice products
- Hyperspectral remote sensing analysis
- Multi-sensor data fusion
- Data mining, including web delivery of raster and vector datasets

## EARTH AIRBORNE AND SATELLITE DATA

**Optical** — Broad range of high-resolution panchromatic, multispectral, and hyperspectral imagery

**Radar** — Single, dual, and multi-polarization synthetic aperture radar imagery

## PUBLISHED WORK

[“Pan-Arctic ice-wedge degradation in warming permafrost and its influence on tundra hydrology”](#)

— **Nature Geoscience, 2016**

[“Rock glacier dynamics in Southern Carpathian Mountains from high-resolution optical and multi-temporal SAR satellite imagery”](#)

— **Remote Sensing of Environment, 2016**

[“A new methodology to monitor soil moisture over a complex Arctic environment, Kobuk River Valley, Alaska”](#)

— **Remote Sensing Letters, 2013**

[“Integrated methodology for mapping and monitoring permafrost and seasonally frozen ground”](#)

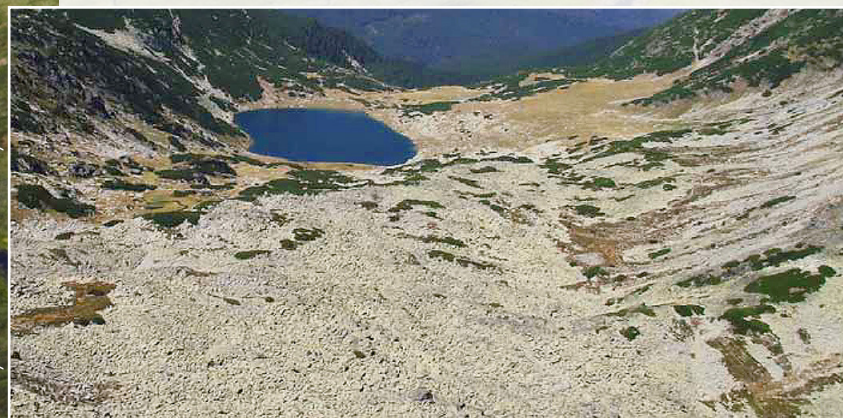
— **OTC Arctic Technology Conference, 2011**

[“Studies of Antarctic sea ice characteristics using surface sea ice measurements and TerraSAR-X data”](#)

— **Proceedings of the 4. TerraSAR-X Science Team Meeting, 2011**

[“Monitoring migration rates of an active subarctic dune field using optical imagery”](#)

— **Remote Sensing of Environment, 2009**



Radar and optical satellite imagery identifies subtle rock glacier movements in Southern Carpathian Mountains.

## Work with SwRI

We are R&D problem solvers providing independent, premier services to government and industry clients.

### CONTRACT VEHICLES

CONTRACT VEHICLES	
USACE	Engineer Research and Development Center (ERDC) Cold Regions Research and Engineering Lab (CRREL), Interdisciplinary Non-Personal Services (W913E5-14-R-001)
GSA	66, 70, 871, and OASIS

Advanced science. Applied technology.

Arctic ice wedge permafrost degradation in tundra regions.



## FEATURED SCIENTIST

**D. Marius Necsoiu, Ph.D., PMP, CMS-RS**  
**Principal Scientist**

Dr. Necsoiu is a remote-sensing scientist with broad experience in geomatics projects. Skilled in developing collaborative and interdisciplinary solutions to Earth and planetary sciences problems, he has also written or collaborated on more than 70 technical papers and reports.



SOUTHWEST RESEARCH INSTITUTE

*Benefiting government, industry and the public  
through innovative science and technology*

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