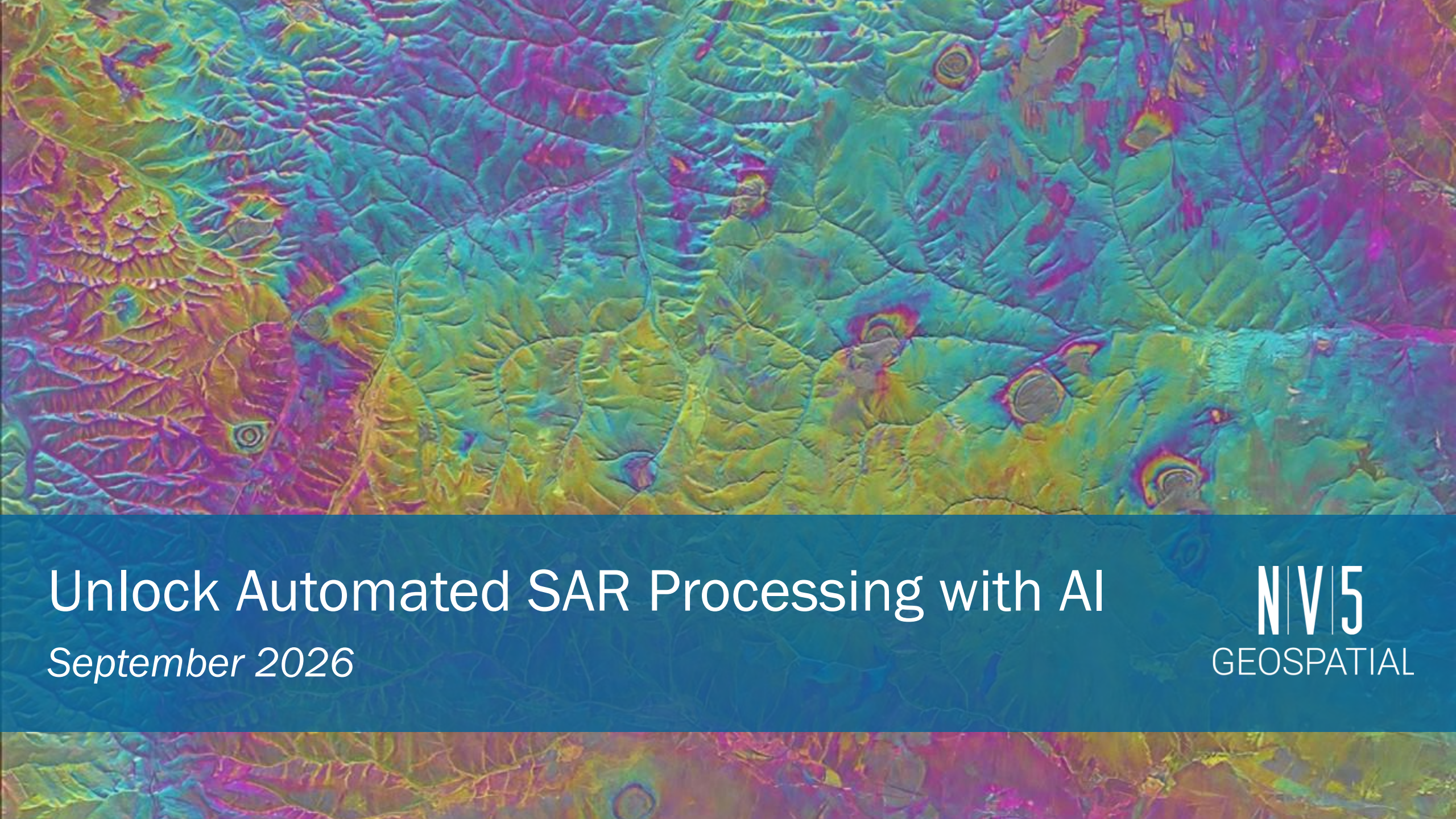




Unlock Automated SAR Processing with AI

September 2026

N|V|5
GEOSPATIAL

BEFORE WE BEGIN...



The webinar is being recorded

- Slides & on-demand version of the webinar will be available within a few business days



Questions?

- Please post any questions in the Questions box

TODAY'S SPEAKER



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AGENDA



- Introduction: ENVI Agent & SAR Capabilities
- What is an Agent?
- ENVI Agent SAR Demo
- What's new in SARscape 6.3.1
- Questions



ENVI Agent

A geospatial partner for planning and executing workflows that keeps you in the driver's seat, allowing you to direct the analysis while it handles the technical heavy lifting



IDL Agent

A programming partner that empowers you to autonomously write, run, and troubleshoot IDL code, simplifying developer workflows and accelerating discovery

What is an Agent?

Components

Context

Tools

LLM

An Agent is an autonomous, AI-driven system that interprets natural language and executes tools to solve user requests

Why are LLMs Helpful?

Reasoning vs Processing

LLMs from simple pattern matching to active problem-solving, allowing them to "reason" through spatial complexities

End of Rigid Workflows

We are moving past "fit-for-purpose" scripts; modern AI adapts to diverse datasets without manual reconfiguration

Human-Centric Logic

By pairing natural language instructions with specialized tools, LLMs can execute multi-step workflows with human-like intuition

LLMs are powered by the context and tools they have available – but they're not magic!



ENVI API

IDL Agent enables you to write and run code that interacts with ENVI, to create new tools and solve problems with a paired programmer



Image Analysis

Full suite of ENVI's processing tools for processing all kinds of imagery datasets



SAR Expertise

Full suite of SARscape's processing tools, including specialized SAR workflows



ENVI Agent and SAR

Key Capabilities:

- **Conversational:** Describe your goal in plain text - such as flood mapping, DEM extraction, or deformation monitoring - and the agent plans and runs the appropriate SAR workflow
- **Transparent Logic:** Review each proposed step and adjust parameters before data processing starts
- **A SARscape Expert:** Access SARscape's algorithms and tools



ENVI Agent and SAR

Summary

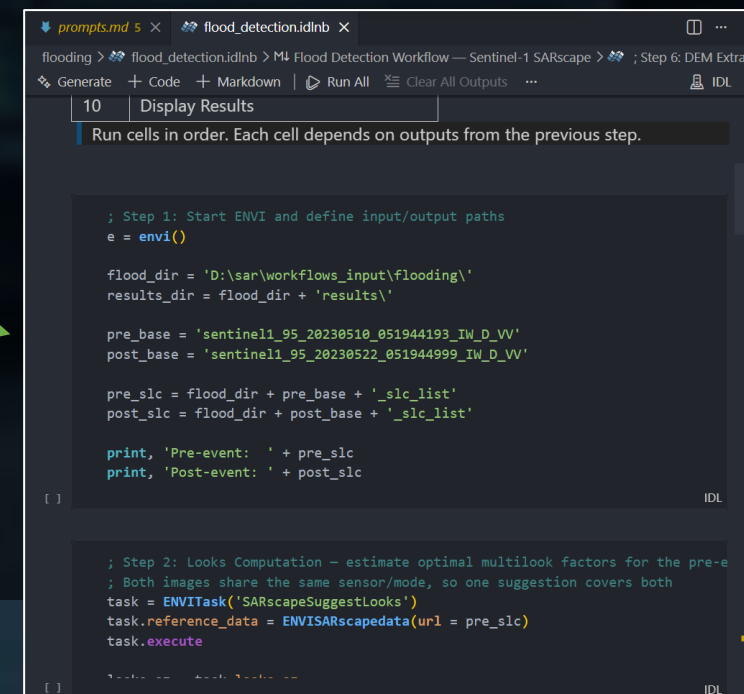
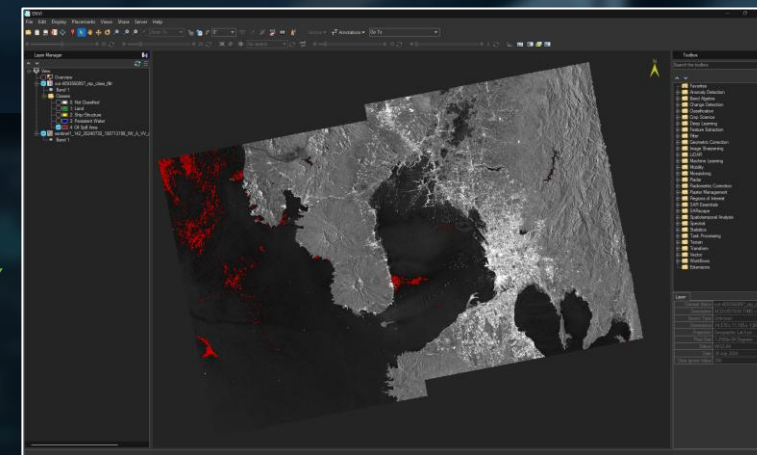
- **Ideal For:** Radar specialists, remote sensing professionals, and analysts looking to streamline SAR and InSAR workflows
- **The Value:** Significantly reduces the effort and complexity of SAR processing and data analysis



ENVI Agent

Example Questions

- What SAR workflows does ENVI have available?
- Using ENVI and sarscape, can you detect oil spills in “this” data?
- Using ENVI and sarscape, how can I do time series analysis?
- [After running processing] Can you summarize that workflow in an IDL Notebook?





ENVI Agent

Example Requests

- Estimate the quality of these polarized images.
- Estimate the size of the oil spill in sqkm.

Oil Spill Area is class index 4. Pixel size is $\sim 13.25 \times 13.83$ m. I'll count the oil pixels directly with IDL:

Ran Execute IDL Code – IDL for VSCode (MCP Server)

The oil spill covers approximately **925.5 km²** based on the current classification.

Metric	Value
Oil-classified pixels	5,048,092
Pixel area	$13.25 \text{ m} \times 13.83 \text{ m} \approx 183.3 \text{ m}^2$
Total oil spill area	$\sim 925.5 \text{ km}^2$

Keep in mind this is an upper-bound estimate at `oil_th=15` — a more conservative threshold would reduce this number. The aggregation (`minimum_size=200`) has already removed small spurious patches, so what's counted here is the coherent spill body.

Quality Interpretation:

1. **HH Polarization** (co-polarized): Shows higher signal strength with ~ 35.8 dB dynamic range, indicating good quality for glacier surface analysis and structural features.
2. **HV Polarization** (cross-polarized): Lower mean amplitude (as expected for cross-pol), but similar SNR (~ 1.80), with 33.0 dB dynamic range. Good for volume scattering analysis from crevasses and surface roughness.
3. **Overall Assessment**: Both polarizations show acceptable quality for L-band SAR analysis. The dynamic range values (> 30 dB) indicate good radiometric resolution suitable for glacier monitoring, interferometry, and change detection applications.
4. **Noise Performance**: Low noise floors in both channels indicate the NISAR data has good sensitivity for detecting low backscatter features like smooth ice or calm water.

These metrics confirm your NISAR data is of good quality for typical SARscape processing workflows including interferometry, change detection, and polarimetric analysis.



Demo: ENVI Agent



ENVI AGENT: TIPS AND TRICKS

Add “ENVI” and “SAR” or “SARscape” to your requests

- Ex: Help me plane a SAR change detection workflow using ENVI
- Ex: With ENVI and SARscape, process the datasets in *this* location using steps 1, 2, and 3.

Ask to organise results in an “output” or “results” folder

- Makes it easy for users and agents to find outputs from processing steps

Be detailed in your requests

- When requests are open ended, it can take a while to get to the right answer. If you are more direct it can save you time.

WHAT'S NEW IN SARSCAPE 6.3.1



New Sensors

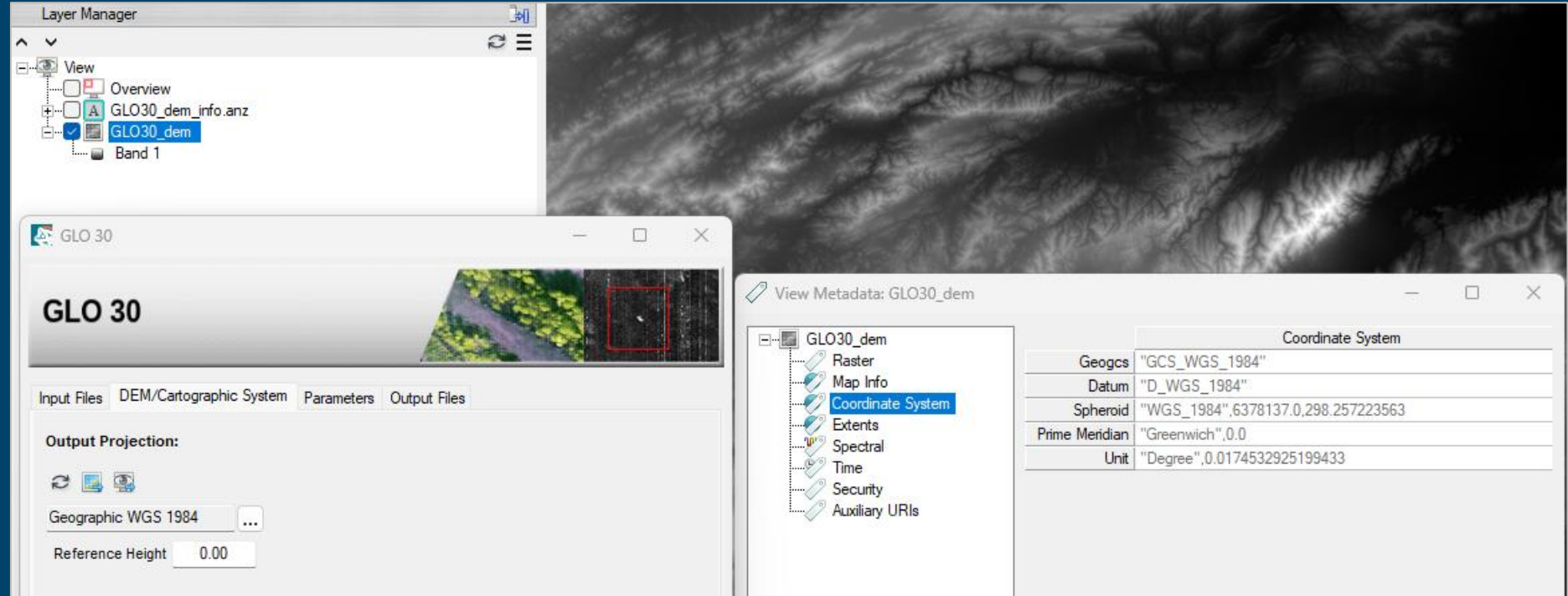
- AIRSAT 01, 02 and 04 (China)
- AIRSAT 05-HS and 08-HS01 (China)
- ALOS PALSAR-3 (Japan)
- BIOMASS (ESA)

New Acquisition Modes

- Capella: TIFF & JSON
- ICEYE: COG & JSON, slant plane geometry in HDF5
- NISAR: RSLC & GSLC, A & B band
- Synspective: STRIX GRD & GRD-SR in TIFF
- SV-2 – SVN-2: StripMap & Sliding Spotlight

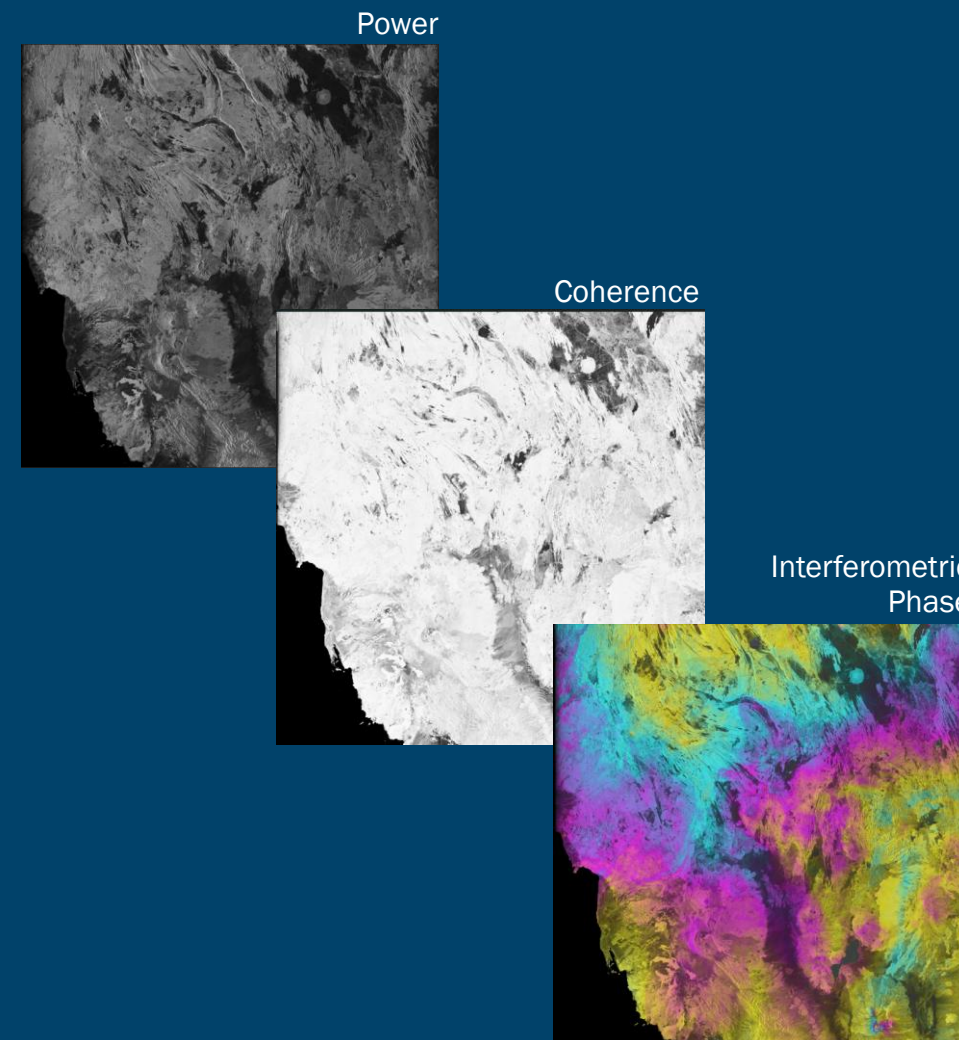
SARSCAPE 6.3.1 – GLO 30 DEM

- New tool
- Query & download Copernicus GLO DEM
- 30m resolution



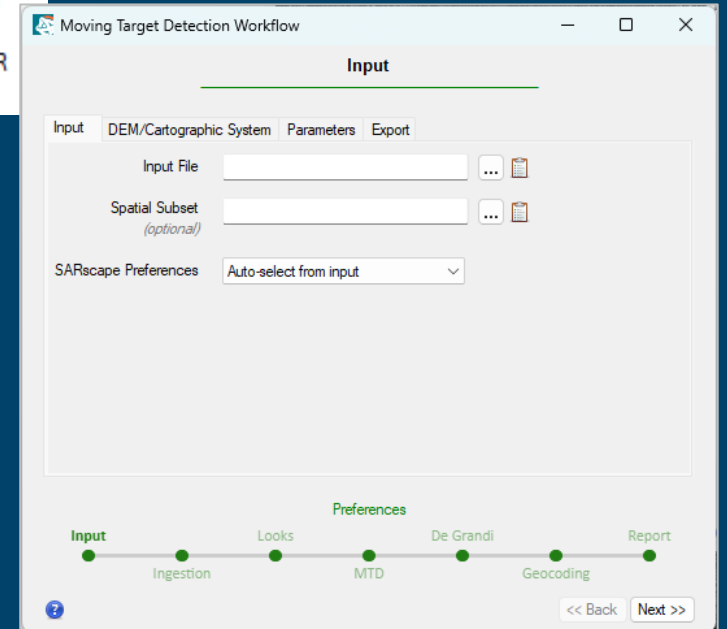
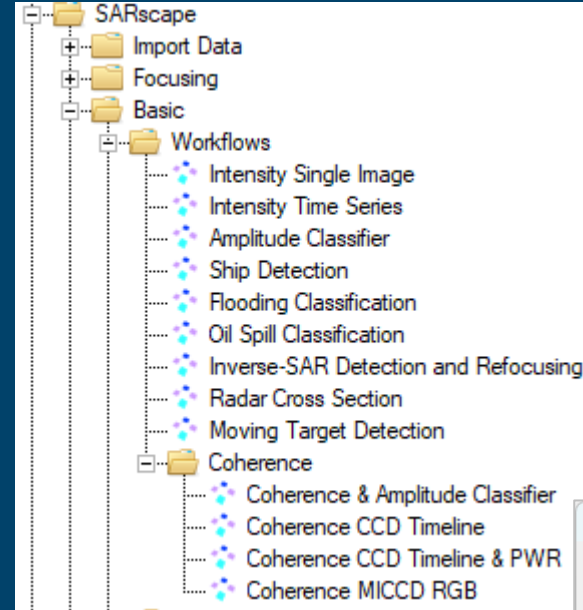
SARSCAPE 6.3.1 - NISAR TASKS

- Download
 - Search, query and download from ASF
- Import
 - L- and S-band data
 - Both A and B frequencies
 - Circular polarisation
 - RSLC & GSLC
- Ionospheric correction for NISAR interferograms
- RSLC data are compatible with all SARscape tools
- GSLC data are compatible with a subset of SARscape tools



SARSCAPE 6.3.1 – NEW WORKFLOWS

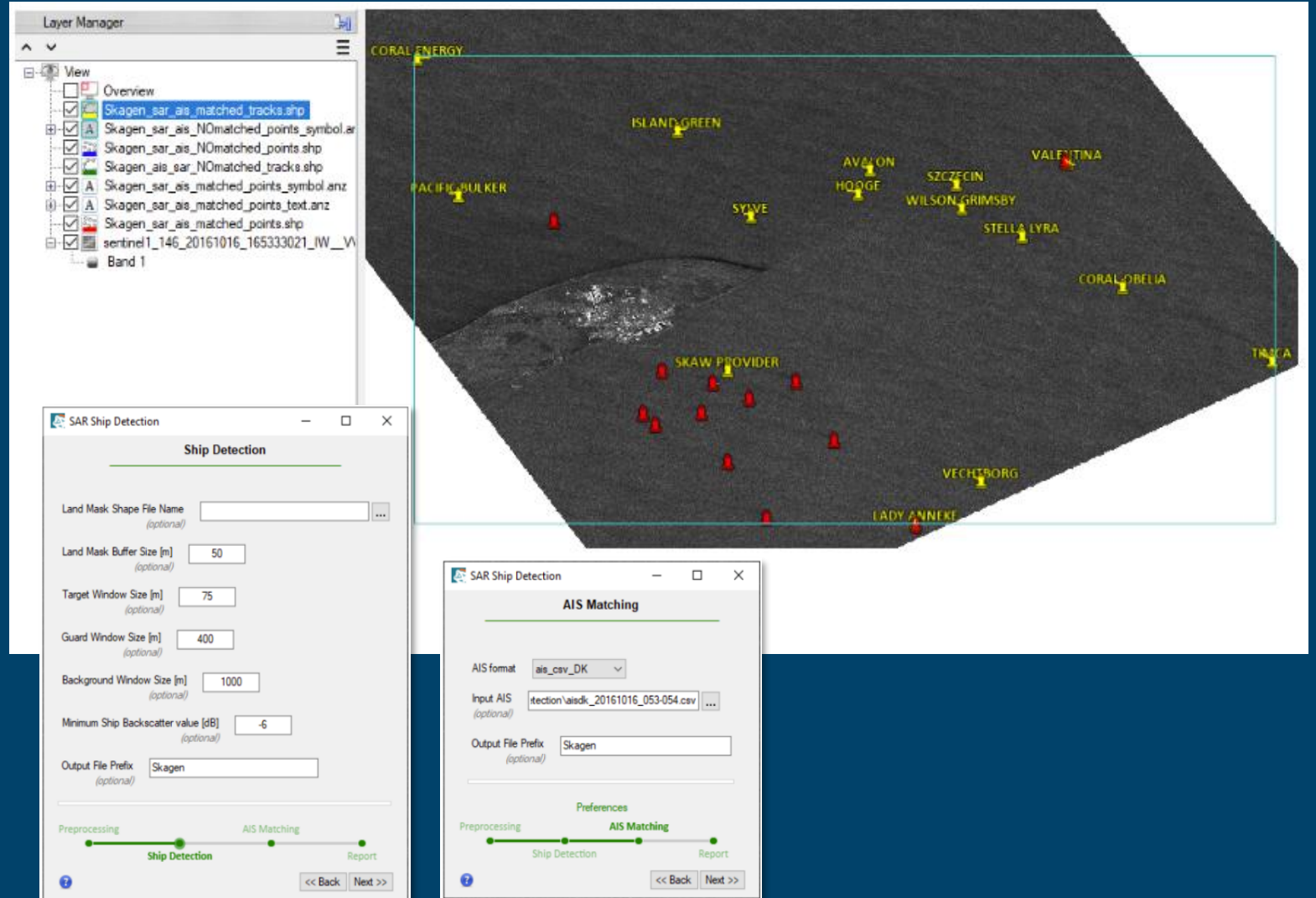
- More user-friendly graphic interface
- Input compatibility check
- Oil spill classification
- Coherence and Amplitude Classifier



SARSCAPE 6.3.1 – NEW WORKFLOWS

Ship Detection Workflow

- Streamlined, user-friendly workflow
- Optional AIS matching
- Both workflow and step by step tools available



ENVI AGENT WITH SARSCAPE 6.3.1

Currently, only a subset of SARscape workflows can be used with ENVI Agent

- Intensity Single Image
- Intensity Time Series
- Amplitude Classifier
- Flooding Classification
- Ship Detection
- Oil Spill Classification
- Inverse-SAR Detection and Refocusing
- Moving Target Detection
- InSAR DEM
- InSAR DEM with GCP
- DInSAR Displacement
- DInSAR Displacement with GCP
- Stereo DEM
- Stereo DEM with GCP
- Amplitude Tracking
- Amplitude Tracking with GCP
- Coherence and Amplitude Classifier
- Coherence CCD Timeline
- Coherence CCD Timeline & Power
- Coherence MICCD RGB



ENVI AGENT: REQUIREMENTS

Framework	Powered GitHub Copilot
Connectivity	<u>Requires internet access</u>
LLMs	~20 for GitHub Copilot Offline or local LLMs not currently supported
Setup	IDL 9.2 or ENVI 6.2 Visual Studio Code and IDL for VSCode Paid GitHub Copilot subscription
Licensing	IDL Agent included with IDL 9.2 ENVI Agent requires additional module

- Software requirements:
 - ENVI Agent
 - ENVI 6.2 or ENVI 6.3
 - ENVI Sarscape 6.3.1
 - Requires SARscape, not SAR Essentials
- Some SAR workflows require additional SARscape modules
 - Complete list [here](#)

An aerial photograph of a mountain peak, likely Mount Everest, with a large, dark, circular overlay centered on the summit. The surrounding landscape is a patchwork of green fields and valleys.

Questions

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