

WEBINAR Q&A

Land & Sea Applications Using SAR

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A recording of this webinar can be found [here](#).

How can I get a PDF of the slides and the recording of the first SAR webinar?

A recording of the first webinar can be found [here](#). While watching the recording there is a form that will pop up asking if you would like to receive the slide deck and other useful resources via email.

Are the SAR tutorials available to anyone?

Yes they are! There are several SAR tutorials available on the SARmap website at the bottom of the page (<http://www.sarmap.ch/wp/index.php/software/sarscape/>). We are also in the process of developing more SAR tutorials that will be available on our website (<https://www.harrisgeospatial.com/Learn>).

What is the longest period between two images that we can use for DInSAR displacement application? Is there a degradation in the orbit of the satellites overtime that prevents using similar geometries?

You want to choose your scenes for single pair DInSAR to highlight the feature you are trying to track. So if you can have scenes directly before and after the event, it will accentuate the change you are interested in. The longer you wait, the more interference and change besides what you are interested in may influence the scene, lowering the coherence and making it harder to have an accurate output.

You may also introduce very different atmospheric affects that can affect your outputs, since it is more likely that the atmosphere has changed the longer your window gets between the two scenes. There are also shifts that can occur in satellite orbits, however Orbital Files exist that help correct for these changes. SARscape has an automatic download for Sentinel-1 Auxiliary data to help you acquire these orbital files.

Is any way to fuse optical Sentinel with Sentinel SAR data?

Absolutely, SAR and optical data are fusible, and you can do a lot of processing with them in tandem. You just need to preprocess both sets, and make sure they are of the same extent. What fusing optical and SAR data allows you to do is add even more of that surface information to help differentiate between things that in optical imagery, may seem very similar.

For oil spills, if we are dealing with a small spill, doesn't the combination of multilooking and filtering reduce the spatial resolution too much?

Multilooking and Filtering may reduce the spatial resolution; however, if you don't do them you may not be able to pick up all parts of the oil spill. If you only need presence or absence that may be all right, but for further analysis you will be missing the data. If you are looking at such small oil spills, it may be necessary to have higher resolution SAR imagery to get it to the best definition.

Which polarization is good for ship and oil spills?

VV is a good choice for viewing surface changes on water, and for the double bounce effects off the ships as they will show up quite differently. HH is mainly used for sea ice detection.

Which unsupervised algorithm was used in the oil spill example?

ISODATA classification was used, which is one of the simplest classification methods, as it is unsupervised and takes no necessary training data. There are many other classification options available with supervised, deep learning, and machine learning options for best results for a given situation.

Which software would be the best for processing SAR data?

SARscape has great capabilities and has multiple guided workflows and singular tasks to create products and answers that best fit your needs. SARscape has full support for any questions with the software and works with ENVI and ArcPRO for integrated analysis with classic toolboxes, such as classification, feature extraction, and the ability to work with fused optical and SAR imagery.

How can I get AIS data?

Harris is a provider of AIS data and is available for a fee. If you are interested in using AIS data for your work, please contact us at geospatialinfo@harris.com.

Should the DEM resolution match the radar resolution? For example, can one use a 1m Lidar derived DEM? Should we use a DEM that matches the SAR spatial resolution, or would it be better to use one of higher spatial resolution?

DEMs are often used when processing SAR data and can be used at a variety of scales. While you may use a DEM that is of significantly lower resolution than your SAR data (for example, a 90 meter DEM with 20 meter SAR data), this may decrease the quality of your output products. You may use a high resolution DEM, such as a LiDAR-derived product, however that is not necessary and may increase your processing times for minimal benefit. It is typical to use a DEM of similar resolution to your SAR data – for example, a 30 meter DEM with 20 meter SAR data – which will produce high quality outputs without requiring larger files and longer processing times.

Are GCPs mandatory for DInSAR displacement workflow?

With the new release of SARscape, GCPs are not mandatory to run interferometry workflows. However, running interferometric analyses without creating GCPs is highly discouraged and has the potential to introduce significant error into your final product.

Regarding DinSAR, is it possible to detect displacements larger than the electromagnetic wavelength?

When working with interferometry, you are generally limited to detecting displacements that are smaller than the wavelength of the SAR signal. This is due to the “ 2π ambiguity.” When phase unwrapping occurs, displacements that are larger than 2π , or the wavelength of your SAR signal, cannot be properly resolved and may be unwrapped incorrectly.

Does DInSAR rely on spatial resolution?

Interferometric analyses are influenced by the spatial resolution of your SAR data. If you are trying to resolve displacements that take place over a few square meters, you would need extremely high resolution radar. For displacements that occur over broad regions, lower resolution radar may be used.