WEBINAR Q&A

Benefits and Applications of Hyperspectral Imagery from the Space Station

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A recording of this webinar can be found here: https://www.harrisgeospatial.com/Company/Events/Webinar/Webinar-Detail/ArtMID/10251/ArticleID/23846/Benefits-and-Applications-of-Hyperspectral-Imagery-From-the-Space-Station

What is the post processed tile file size?
2.55nm L1C (orthorectified, radiometrically calibrated, atmospherically corrected is 500mb) this varies if you save intermediate projects and if you work with integers after atmospheric correction, which QUAC produces automatically in ENVI and I recommend.

What is the data format in which DESIS is distributed? Does ENVI recognize it and import smoothly?
Tiff with an ENVI header. ENVI brings in the radiance gains and offsets and all relevant metadata. These is also an XML file if you wish to parse that

Could you elaborate how to access the data? Do people need to be an investigator of a current NASA project?
DESIS is open to commercial, academic institutions, international governments and nonprofits at Teledyne.tcloudhost.com. See slide 29 for contacts. Cost depend on a variety of factors, please contact amanda.oconnor@teledyne.com

How would DESIS commercial sensor pointing requests work (if they are possible)? If we would need data for specific area what is the likelihood that such request would be granted? What would be cost associated?
This depends on very many factors, size of your areas, repeat cycle, conflicts, we would need really need to discuss, please email me at amanda.oconnor@teledyne.com and we can chat. At this point we've been able to work through conflicts without much issue tasking wise. We typically assess commercial collects for a variety of factors and work through a contract to get to a cost that works for you.

What do you mean by "resampling to Worldview-2"?
ENVI can take DESIS and other hyperspectral data and libraries and use the WorldView 2 band passes to simulate what data from that sensor would look like. Same applies to WV3, Landsat or any multispectral sensor for where the filter function is known. ENVI has many of these filter functions and can easily perform this task with a few button clicks. https://www.harrisgeospatial.com/docs/SpectralResampling.html

What does DLR mean?
Deutsches Zentrum Fur Luft und Raumfahrt or the German Aerospace Center—Germany's Version of NASA

Given 30 m spatial resolution and potential for sub-pixel analysis what is the smallest size of marine debris we could detect using DESIS data?
I would say 10% of the pixel if the signals are distinct as I showed.

I am a new user to ENVI. Please explain a little bit about spectral signature library and ROIs.
The spectral signature library is a in software technology that allows you to do comparisons with known libraries of spectra, so full spectrum reflectance response of materials ranging from minerals to vegetation, to man made features, and compare them to spectra that are collected in the scenes themselves. You can also import and create your own signatures as well. ROIs are regions of interest, so areas that you can outline in ENVI for training, classification, labelling etc. These are usually used to test areas of spectral response, or to do training for identification and classification.
https://www.harrisgeospatial.com/docs/RegionOfInterestTool.html

Can you recommend an atmospheric correction module in ENVI for land, that you've used with DESIS data?
I personally use ENVI's QUAC algorithm for land images. This is in the Atmospheric Correction Module.
https://www.harrisgeospatial.com/docs/ENVIQUACTask.html

How specific are the spectral libraries in terms of vegetation? Veg type? Species?
There are some in ENVI, like vegetation from a region (aspens, pines, grasses). ENVI uses third party libraries from APL, USGS etc. Check out the GHISA project. https://www.usgs.gov/centers/wgsc/science/global-hyperspectral-imaging-spectroscopy-agricultural-crops-vegetation-ghisa
https://www.harrisgeospatial.com/docs/SpectralLibBrowser.html

Over what time range is DESIS available?
Oct 2018 to present with a five-year lifespan.

Can we use this product to detect dust storms?
The instrument would need to be tasked to where you think the dust storm is, but yes it could potentially evaluate dust particles. Remember the footprint is 30km x 30km

There are many natural seeps in the northern Gulf of Mexico. Can you tell the difference with DESIS data between those and man-made seeps/spills?
We would have to test it against natural vs platform leaks or man mad seeps. If the oil is from a different substrate or had to "bubble" more to reach the surface, there may be spectral differences. I would recommend consulting the USGS work on the BP oil spill. https://pubs.usgs.gov/of/2010/1167/

Great swaths of Canada are not covered - is this the reality?
DESIS is on the International Space Station which has a more equatorial orbit that polar orbiters like Landsat, so the highest north it can image with its off-nadir pointing is 55 degrees north. Imaging on the ISS has some limitations, but it provides a fast and lower risk option to get instruments into space. DESIS collects data for 90% of the populated earth. High quality hyperspectral from space from instruments like DESIS show what is possible and will hopefully lead to other instruments in the future to expand coverage, continue DESIS' legacy, and grow the tremendous wealth of information hyperspectral can provide.

I am from the hyperspectral field, and just wondering how one can find 50cm plastic debris using 30m HSI imagery?
The Garbage gyre has large nets and debris that aggregates into very large rafts and that is what we are detecting. A single 50cm piece of plastic probably wouldn't be visible in DESIS data, but one piece of plastic is not typically the case we see, there's sadly usually a lot. https://www.oceanvoyagesinstitute.org/ Subpixel analysis can also be used to see how much of a pixel is plastic/debris vs water.