[**New Approaches for Integrating Remote Sensing Tools and Other New Technologies Into Compensatory Mitigation Programs:**](https://www.eli.org/events/new-approaches-integrating-remote-sensing-tools-and-other-new-technologies-compensatory) Resources, Questions, and Emails

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# From ELI

1. [ELI’s Wetlands Page](https://www.eli.org/wetlands-program)
2. Remote Sensing Workshop 1: [Bridging Remote Sensing, Participatory Science, and Wetlands Programs: An ELI Workshop](https://www.eli.org/events/bridging-remote-sensing-participatory-science-and-wetlands-programs-eli-workshop)
3. Remote Sensing Workshop 2: [From Data to Decisions: Remote Sensing and Wetland Resilience](https://www.eli.org/events/data-decisions-remote-sensing-and-wetland-resilience)
4. Remote Sensing Workshop 3: [New Approaches for Integrating Remote Sensing Tools and Other New Technologies Into Compensatory Mitigation Programs](https://www.eli.org/events/new-approaches-integrating-remote-sensing-tools-and-other-new-technologies-compensatory)

# From Panelists

## Dr. Mac McKee

Email: [mac.mckee@usu.edu](mailto:mac.mckee@usu.edu)

Questions:

1. What band is coastal blue?
   1. If I remember correctly, coastal blue is roughly 425 to 450 nm.
2. How to you explain the unknown 'methods' that are used by AI machine learning to classify features?
   1. I hope I didn’t say we used unknown methods. As I said, we used something called relevance vector machines, and we have used a number of other learning machines as well. For the phragmites problem, RVMs worked the best. There are several of these algroithms available, including some that are built into some GIS solftware. Very few of these are super easy to understand in term their underlying mathematics. Let me know if you need more detail.
3. We are using consultants. What questions do you recommend we ask to make sure that we are getting quality service/data?
   1. I recommend you have a very clear understanding of: (1) the question/problem you wish to resolve using RS, (2) the analyses that will be required on the data that your imagery contains, and (3) the precise spectral bands you will need, the spatial resolution you will need, etc. In our experience, some consultants will only provide the imagery and you are left with the analytics. Others might provide additional analytics, such as surface classification. For things such as this, be sure that they can tell you what they estimate to be the geopositional accuracy is of the imagery, the accuracy of the classification they have done, etc. For example, we have often seen imagery providers (as well as some stitching software) say that the average error could be as good as +- three pixels. This is really a lower bound on their accuracy, and if that is not sufficient for your needs you should shop around.
4. Is the lack of ongoing funding for monitoring a plus or minus for using remote-sensing to monitor change over time? Getting money for monitoring is a big issue for on-the-ground work, but that makes remotely sensed approaches "look" more attractive...
   1. Answered Live – [Please see webinar recording .](https://www.eli.org/events/new-approaches-integrating-remote-sensing-tools-and-other-new-technologies-compensatory)
5. How much as AEM Airborne ElectroMagnetic and groundwater come into play in your experience?
   1. We have done nothing with these technologies. We have used data from such studies, but we have no first-hand experience.
6. What qualifications should we be asking for consultants that we are requesting LiDAR data from? They will do flight and put together data.
   1. This depends on the nature of the problem/application of interest. I am not an expert in LIDAR but I can put you in touch with one of our people who is. We are just now beginning to use LIDAR on our UAVs, so the little I know mostly relates to the very small, low-power LIDAR sets that will fit within the weight, space, and power limitations of our drones. Extrapolating from that to LIDAR for RS in general, I would ask questions about the quality of their imagery products. These would include the density of points they can produce (essentially, number of laser hits per square meter), how each is measured, e.g., the LIDAR instrument might capture the return time for several points in order to make an estimate of a single point. I would be interested in how many of these returns they capture and how they use them to estimate an “average”. As I said, however, I am not an expert so contact me and I will had you to one of our people who is.
7. Do you have any references that you recommend for people just starting to learn about remote sensing? Books, websites, online classes.
   1. I have references but none of these are easily accessible to me from my current geographical location (in Heraklion, Crete, Grteece). I can ask a colleague to help me out and will reply to you if you will contact me by email (Email: [mac.mckee@usu.edu)](mailto:mac.mckee@usu.edu). There are a few free pdf versions of introductory texts that you can find by googling. These are perhaps not as good as what you might find in hardback, but they are free and easy to obtain.

## Andrew Mindermann

Email: [amindermann@skytecllc.com](mailto:amindermann@skytecllc.com)

Additional Resources:

1. Skytec Website - <https://www.skytecllc.com/>
2. Skytec - Ranger Story Map: <https://storymaps.arcgis.com/stories/9b4be0a4a3ce4f4b98bb1a61abf15dfe>

Questions:

1. On the Geo AI / Analytics slide by Skytech, it shows vegetation growth, not just loss / land disturbance. What is the size of vegetation growth that can be measured? Interested in being able to measure growth gains in riparian restoration plantings.
2. Answered Live – [Please see webinar recording .](https://www.eli.org/events/new-approaches-integrating-remote-sensing-tools-and-other-new-technologies-compensatory)
3. How do your platforms intergrate into already available open source datasets, for example NASA earthdata, soil inventories, usgs flow data etc?
   1. Answered Live – [Please see webinar recording .](https://www.eli.org/events/new-approaches-integrating-remote-sensing-tools-and-other-new-technologies-compensatory)
   2. Resources related to this answer: Skytec - Ranger Story Map: <https://storymaps.arcgis.com/stories/9b4be0a4a3ce4f4b98bb1a61abf15dfe>
4. What do you all think about the integration of CAD and Survey stations into GIS and Remote sensing?
   1. Answered Live – [Please see webinar recording .](https://www.eli.org/events/new-approaches-integrating-remote-sensing-tools-and-other-new-technologies-compensatory)
5. A lot of organizations that do wetlands work, bluntly speaking, may not have much money to pay for tools or subscriptions. Do you see opportunities or avenues that are especially promising with respect to addressing accessibility to RS-based planning, conversation, planning tools?
   1. Answered Live – [Please see webinar recording .](https://www.eli.org/events/new-approaches-integrating-remote-sensing-tools-and-other-new-technologies-compensatory)
6. What is the status of airborne and satellite chemical sensors such as for greenhouse emissions (e.g., methane) and air pollutants such as from wildfires? What spatial resolution is now available for these and may be in the future?
   1. Answered Live – [Please see webinar recording .](https://www.eli.org/events/new-approaches-integrating-remote-sensing-tools-and-other-new-technologies-compensatory)

## Clay Word

Email: [clay@upstream.tech](mailto:clay@upstream.tech)

Additional Resources:

1. Upstream Tech Website – [www.upstream.tech](http://www.upstream.tech)
2. Upstream Tech Datasets - <https://www.upstream.tech/lens/datasets>

Questions:

1. How do your platforms intergrate into already available open source datasets, for example NASA earthdata, soil inventories, usgs flow data etc?
   1. Answered Live – [Please see webinar recording .](https://www.eli.org/events/new-approaches-integrating-remote-sensing-tools-and-other-new-technologies-compensatory)
2. Resources related to this answer: Upstream Tech - <https://www.upstream.tech/lens/datasets>
3. What do you all think about the integration of CAD and Survey stations into GIS and Remote sensing?
   1. Answered Live – [Please see webinar recording .](https://www.eli.org/events/new-approaches-integrating-remote-sensing-tools-and-other-new-technologies-compensatory)
4. What is the status of airborne and satellite chemical sensors such as for greenhouse emissions (e.g., methane) and air pollutants such as from wildfires? What spatial resolution is now available for these and may be in the future?
   1. Answered Live – [Please see webinar recording .](https://www.eli.org/events/new-approaches-integrating-remote-sensing-tools-and-other-new-technologies-compensatory)
5. I ask because Cal DWR has AEM data available from their Underground Aquifer Mapping Project. We look for wetlands restoration opportunities at large-scales (<3,000 acres) and are curious if we could use their AEM data as part of that effort, but I need to learn more! ;) Thanks!
   1. I’ll have to look into this Mike! I’ll ping our product manager and ask if this sort of data is compatible within Lens but awesome idea! Will follow-up directly with an email. Thanks!

## U.S. Army Corps of Engineers

1. Justin Elkins

2. Ryan Hendren

3. David Shaeffer

Additional Resources:

1. Similar viewer tools available to the public: The National Map <https://apps.nationalmap.gov/viewer/>
2. District seagrass maps are available for download via our geospatial open data portal (<https://data-swfwmd.opendata.arcgis.com/>). The University of South Florida Water Institute’s open data portal also hosts many of the District’s seagrass maps (<https://data-waterinstitute.opendata.arcgis.com/)>.

Questions:

1. Is this viewer available for all the states or only those list towards the top of the tool bar?
   1. This is an internal Corps Regulatory tool and includes all States and US Territories
2. Are there any plans to make this tool open to the public?
   1. No, this is internal for Regulatory use to verify and review data submitted by the public. There are several similar viewers publicly available The National Map is one option <https://apps.nationalmap.gov/viewer/>

## Jeannette Blank

Email: [jblank@freshwaterpartners.org](mailto:jblank@freshwaterpartners.org)

Additional Resources:

1. Montana Freshwater Partners Website: [Montana Freshwater Partners | Formerly Montana Aquatic Resources](https://freshwaterpartners.org/)
2. USGS EarthExplorer: https://earthexplorer.usgs.gov/
3. Upstream Lens Program: www.upstream.com
4. Antecedent Precipitation Tool: <https://www.epa.gov/wotus/antecedent-precipitation-tool-apt>
5. USDA Drought Monitoring Data: <https://droughtmonitor.unl.edu/>
6. AgACIS climate data: <https://agacis.rcc-acis.org/>

## Bob Siegfried

Email: [bsiegfried@res.us](mailto:bsiegfried@res.us)

Additional Resources:

1. RES Website: [Resource Environmental Solutions, LLC | RES is the nation’s largest ecological restoration company, and is restoring a resilient earth for a modern world.](https://res.us/)

## Tee Clarkson

Email [tee@broadwaterinnovations.org](mailto:tee@broadwaterinnovations.org)

Additional Resources:

1. Broadwater Innovations Website: <https://www.broadwaterinnovations.org/>

## Additional Questions

1. Something i have heard, that i think you have mentioned is the thinking - we have done this in this particular way for a long time, why not continue to do things this way. have you ever been involved in pursuading in a conversation like this? what did you bring up?
   1. Answered Live – [Please see webinar recording .](https://www.eli.org/events/new-approaches-integrating-remote-sensing-tools-and-other-new-technologies-compensatory)
2. Our region tends to have alot of turn over in our aquatic resource agencies so we often are tasks with educating them. Are their any suggestions
   1. Answered Live – [Please see webinar recording .](https://www.eli.org/events/new-approaches-integrating-remote-sensing-tools-and-other-new-technologies-compensatory)