Part 1 Questions & Answers Session A

Please type your questions in the Question Box. We will try our best to get to all your questions. If we don't, feel free to email Amita Mehta (amita.v.mehta@nasa.gov).

Question 1: Can I download my maps with different days (timelines) from Worldview or is it only for viewing? Are these data only for the US, or worldwide?
Answer 1: You can download the data for different days from Worldview. Other than a few specific data, most data have global coverage.

Question 2: Is Earthdata Search where we can download data and Worldview is a tool for it. Is that correct? Can we get the same data from GEE?
Answer 2: NASA Earthdata Search provides a complete list and access to NASA data. NASA Worldview has a subset of these data with low latency and allows visualization. Once a select data to view and download from Worldview, you will be taken to Earthdata Search for download. Many of these data are available in GEE.

Question 3: Does this work the same way as the Copernicus browser?
Answer 3: There are some similarities for spatial and temporal selection and visualization, but not identical. Also, Copernicus Browser provides Sentinel-1, -2, -3, -5, and -6 data only.

Question 4: Is it possible to detect contamination of surface as well as ground water with satellite images? Is it possible to interpret the contamination of water just by visual image interpretation?
Answer 4: Ground water quality can not be detected from satellite data. For surface water, satellite images can indicate water color which can qualitatively indicate contaminants such as sediments, chlorophyll-a.

Question 5: Is there a Stack Catalogue for NASA Earthdata? How can we gain access to data on this platform without clicking around?
Answer 5: Clicking around is for simplicity to click and pick. There is Data Catalog on NASA Earthdata.

Question 6: How can we access optical/thermal data with appropriate resolution in the areas outside of Europe, like a specific part of Africa, and without cloud coverage?

Answer 6: These satellite data are global. In a waterbody minimum of 3 pixels are recommended to assess water quality. Depending on the size of the area of interest, one can determine which satellite data to use. Cloud coverage is a real issue with optical data. One can composite images from different satellites with different overpass time or can composite data in time to find cloud-free conditions.

Question 7: Can we detect heavy metals using this?

Answer 7: Some research publications are there on this topic (e.g., https://doi.org/10.3390/rs16203888; https://doi.org/10.1016/j.jenvman.2017.01.034).

Question 8: Can we measure dissolved oxygen (DO) and biochemical oxygen demand from images of a water body?

Answer 8: Dissolved Oxygen would not change optical characteristics of water, so direct assessment of DO or biochemical oxygen is not possible just from satellite images. There are studies where statistical algorithms are developed relating in situ DO data and parameters such as water temperature and chlorophyll concentration (e.g., https://repository.library.noaa.gov/view/noaa/40484) and then used to predict DO.

Question 9: Can I download CyAN Data worldwide?

Answer 9: CyAN is only available currently in the United States. There is a tool, Satellite-based analysis Tool for Rapid Evaluation of Aquatic EnvironMents (STREAM), which provides high-resolution data of chlorophyll-a, Total Suspended Sediments, and Secchi Disk Depth worldwide. These data, along with in situ cyanobacteria data, can be used to develop algorithm analogous to CyAN (see referenced at https://www.epa.gov/water-research/cyanobacteria-assessment-network-cyan#Publications).

Question 10: Are you saying using STREAM, we are able to detect or visualise cyanobacteria?

Answer 10: No, STREAM can not provide cyanobacteria information – please see the answer above.

Question 11: What data is available globally and not just US?

Answer 11: All the imagery is available globally that we shared today. One can access these data from Earthdata Search and Worldview. CyAN is US specific. Also, worldwide statistics of waterborne diseases can be found from WHO.

Question 12: Can we get data and values among glaciers?

Answer 12: You can obtain snow and ice cover data from satellites. Water quality indicators of glacial lakes and glacial discharge plums are observed from remote sensing images. (e.g., https://doi.org/10.1016/j.jag.2025.104392, DOI: 10.34133/remotesensing.0049).

Part 1 Questions & Answers Session B

Please type your questions in the Question Box. We will try our best to get to all your questions. If we don't, feel free to email Amita Mehta (amita.v.mehta@nasa.gov).

Question 1: Is the key issue sewage contamination/wastewater treatment for the US's waterborne illnesses/impacts?
Answer 1: It is one of several factors, but not the key issue in the US for waterborne illnesses. Urban, Industrial, and agricultural runoff also contribute to pathogen growth.

Question 2: Can unusually low dissolved oxygen be quantified with RS?
Answer 2: Dissolved oxygen does not change optical properties of waters, so cannot be detected directly from remote sensing. However, can be inferred from other water quality parameters (e.g., water temperature and chlorophyll concentration – see the answer to Question 8 above) or can be obtained from biogeochemical models of water quality (e.g., https://doi.org/10.1098/rsta.2016.0328).

Question 3: Is there a scale to rank a region's wastewater's mitigation/remediation/treatment success?
Answer 3: Monitoring water quality (some parameters can be monitored from satellite images) near wastewater treatment plants may help in mitigation efforts (e.g., https://doi.org/10.1016/j.dwt.2024.100549).

Question 4: Are there additional hyperspectral imaging instruments on the ISS?
Answer 4: Yes, EMIT is a hyperspectral imaging instrument on the ISS.

Question 5: Is there a specific definition/range for thermal pollution in regards to wastewater that is discharged?
Answer 5: A number of research studies show how thermal imagery can be used for monitoring thermal pollution. Specific range would depend on waterbodies of interest. Both increased temperature due to industrial cooling and decreased temperature due to discharge in waterbodies affect thermal signature.

Question 6: Is it possible to animate average rainfall pattern over a specified period?
Answer 6: Yes, using the NASA Worldview tool, precipitation can be animated. Another tool to average data and animate is NASA Giovanni.

Question 7: Working with WorldView, is it possible to download georeferenced products to include them in a program like QGIS?
Answer 7: Yes, once a data product is selected in Worldview, the data can be downloaded via NASA Earthdata Search in NetCDF format which can be used in QGIS.

Question 8: Is it possible to develop a real-time application utilizing these platforms to notify individuals about waterborne disease? If so, how? Please provide me with some directions.
Answer 8: Please see Part 2: Using Remote Sensing-based Cholera Predictive Intelligence for Intervention and Mitigation.