

Advancing Hyperspectral Data Analysis with the EnMAP-Box



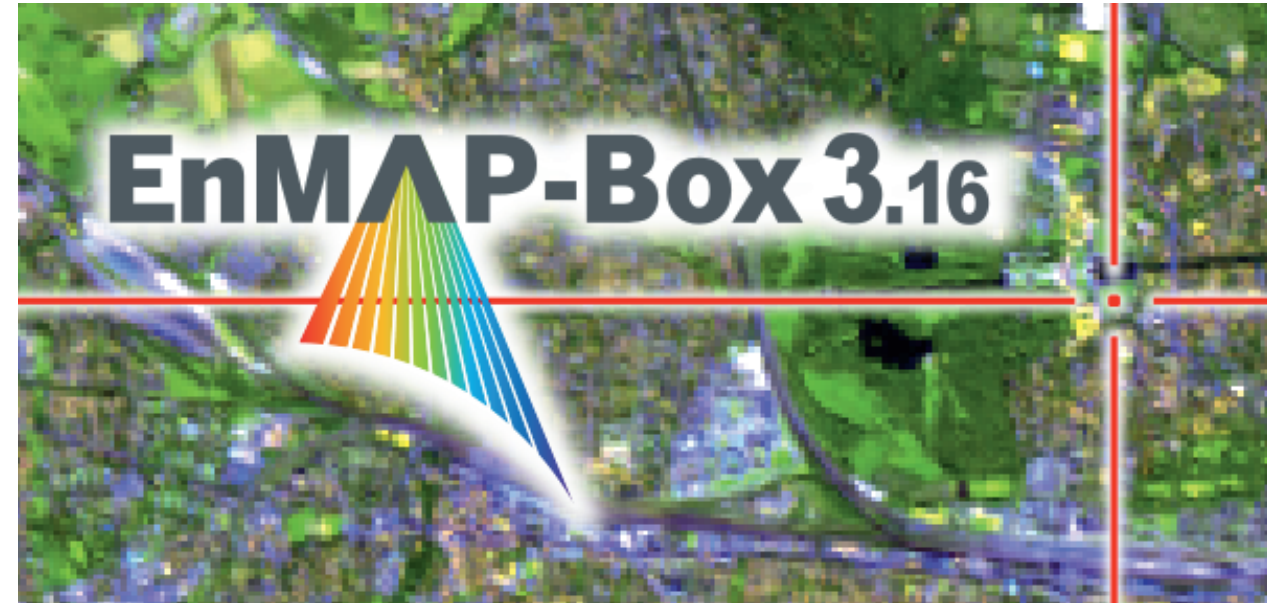
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Objectives

- Facilitate visualization & analysis of imaging spectroscopy data
- Support a wide range of multi- and hyperspectral datasets and geospatial formats
- Integrate state-of-the-art tools for processing & analysis

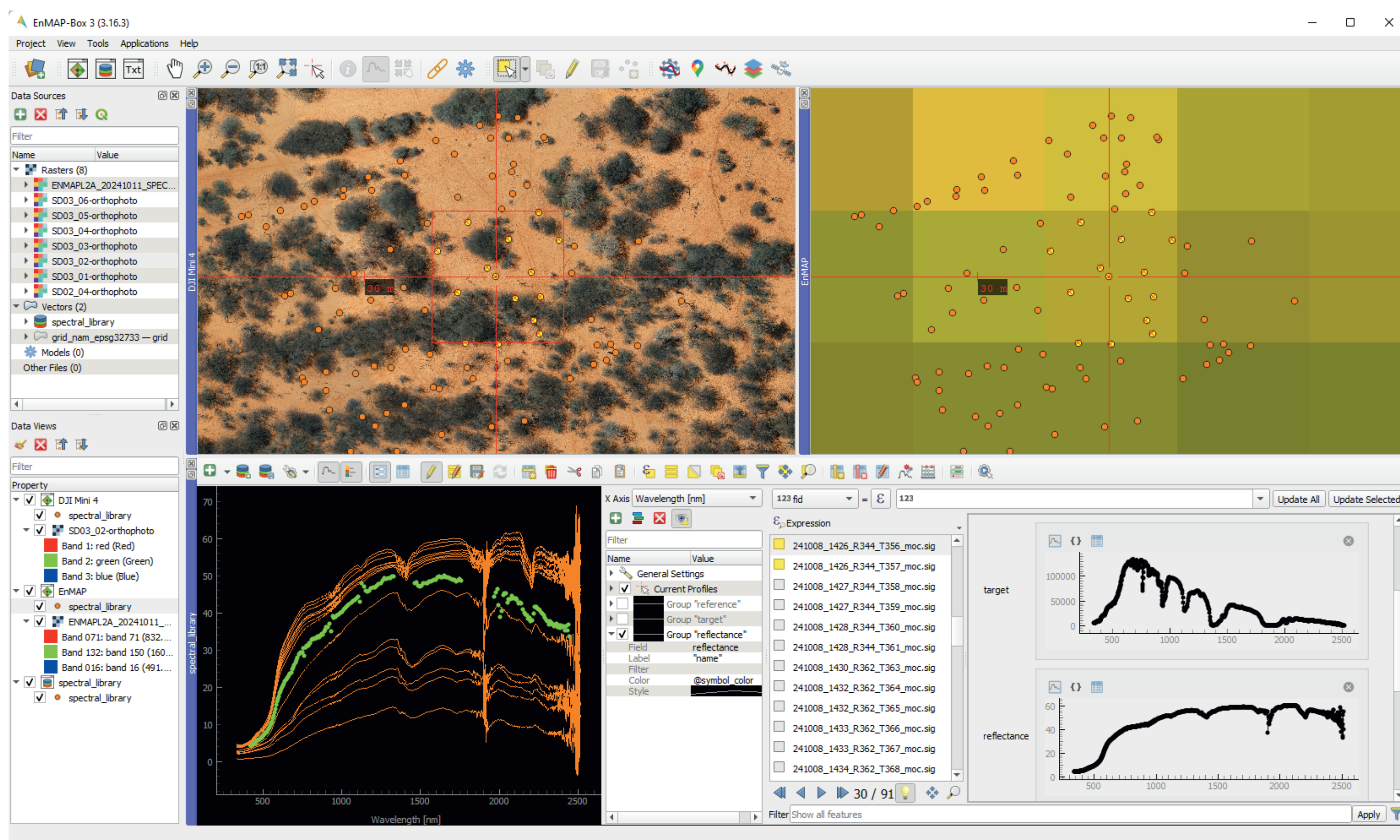


Features

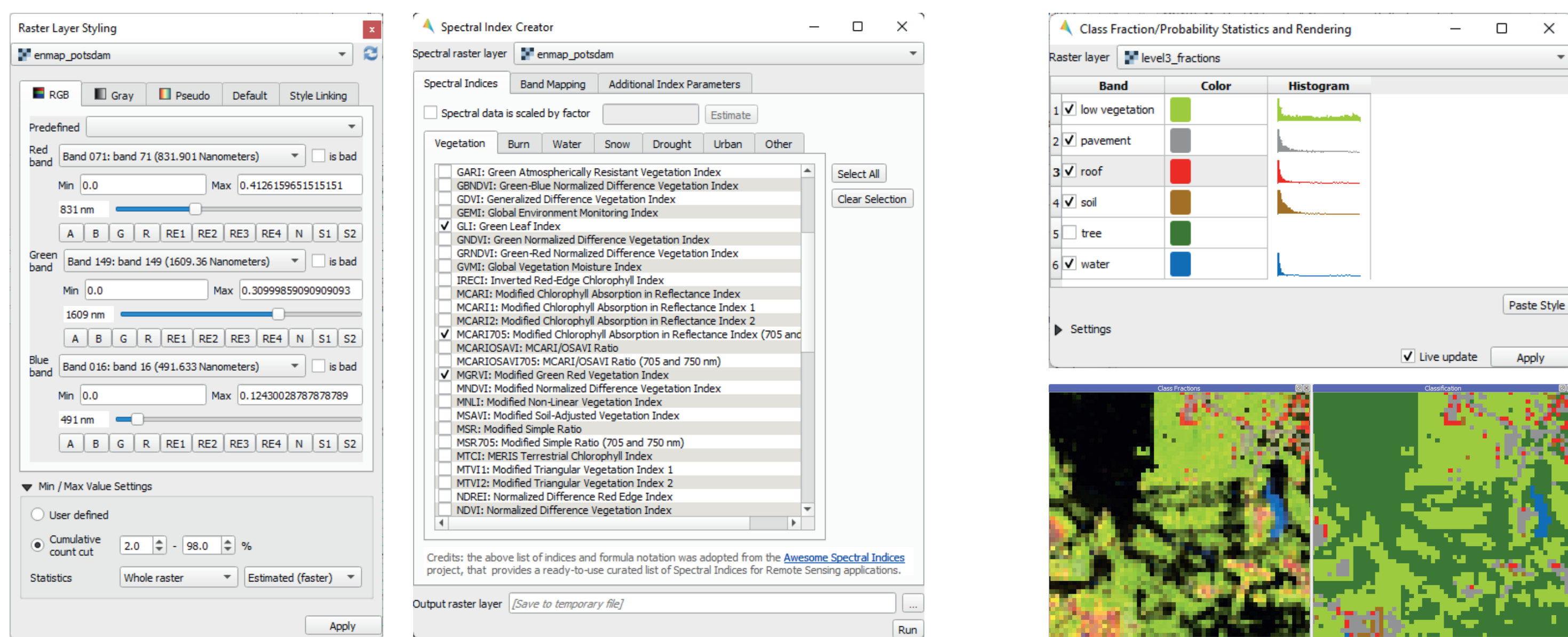
- Free and open source QGIS plugin
- Integrated visualization of raster-, vector and spectral library data
- Applications optimized for hyperspectral data analysis
- Specialized tools for raster visualization
- 150+ algorithms integrated into QGIS Processing Framework
- Create, edit, and visualize spectral libraries



Examples

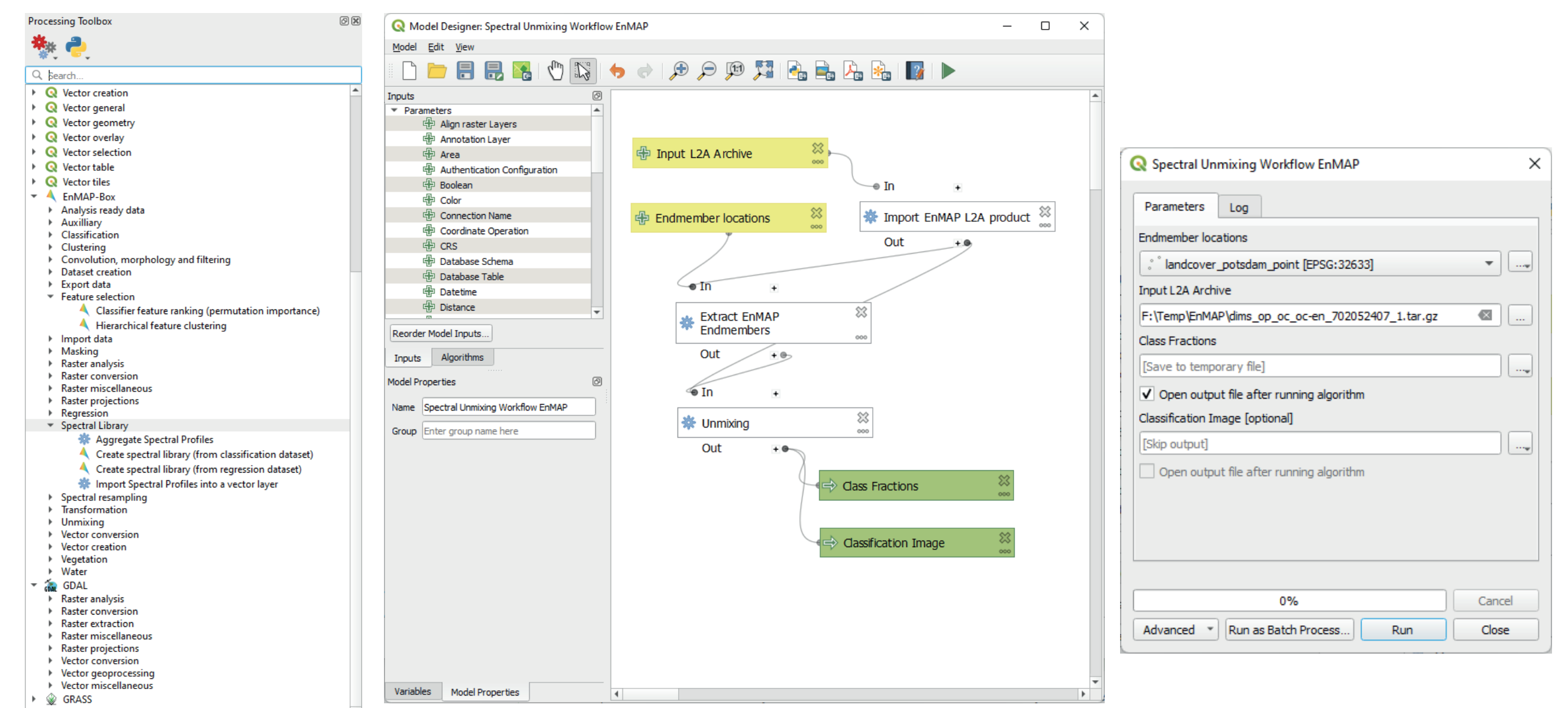


The EnMAP-Box provides a powerful and extensible GUI for integrated visualization of raster, vector, and spectral library data. Top row: UAV orthophoto (DJI Mini 4), corresponding EnMAP observation, and locations of in-situ profiles recorded with an SVC HR-1024i. Spectral profiles from SVC (orange) and EnMAP (green) and their attributes are displayed in the Spectral Profile viewer (bottom).

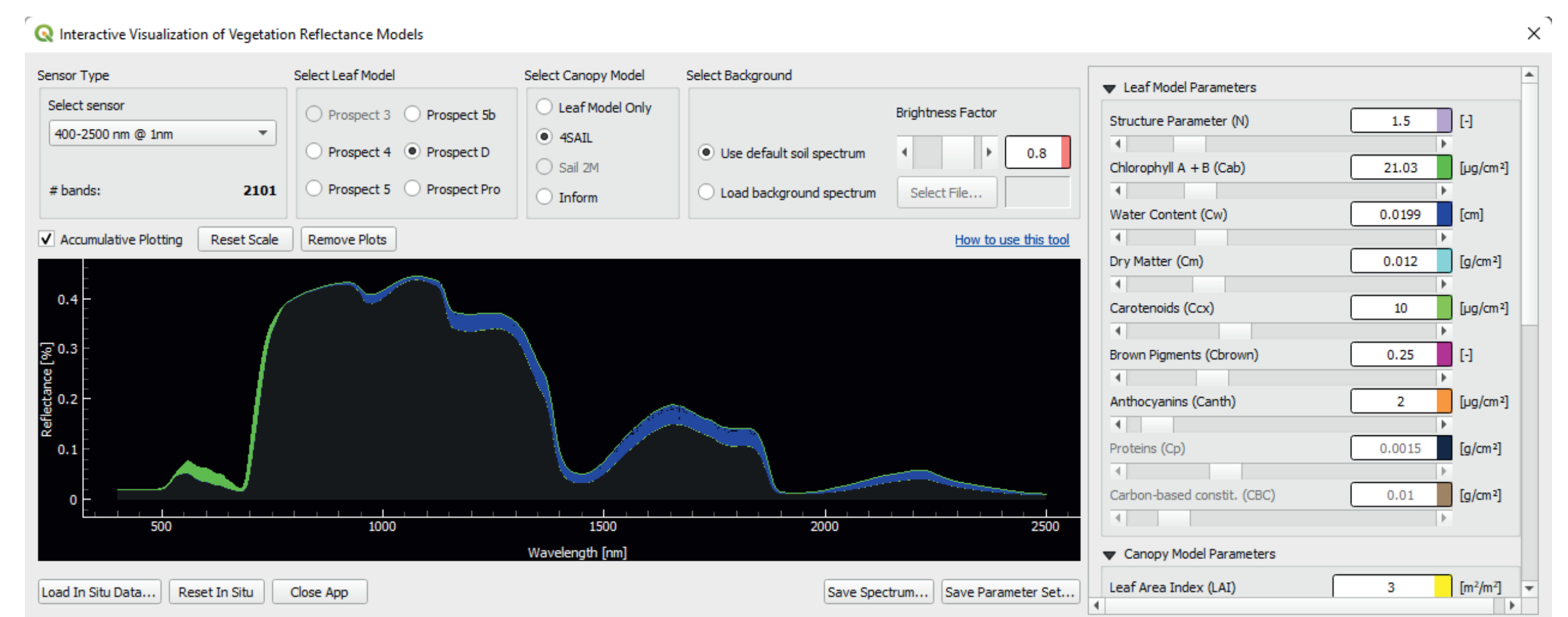


The EnMAP-Box makes extensive use of available metadata, such as spectral information. With hyperspectral data sets such as EnMAP or PRISMA (featuring over 200 bands), selecting specific bands and band combinations becomes straightforward (left). Tools like the Spectral Index Calculator (right) can automatically identify the required bands.

Specialized renderers, such as the Class Fraction Renderer (top), enable optimal visualization raster of raster data — for example, to display spectral unmixing fractions (bottom left) and compare them with conventional classification results (bottom right).

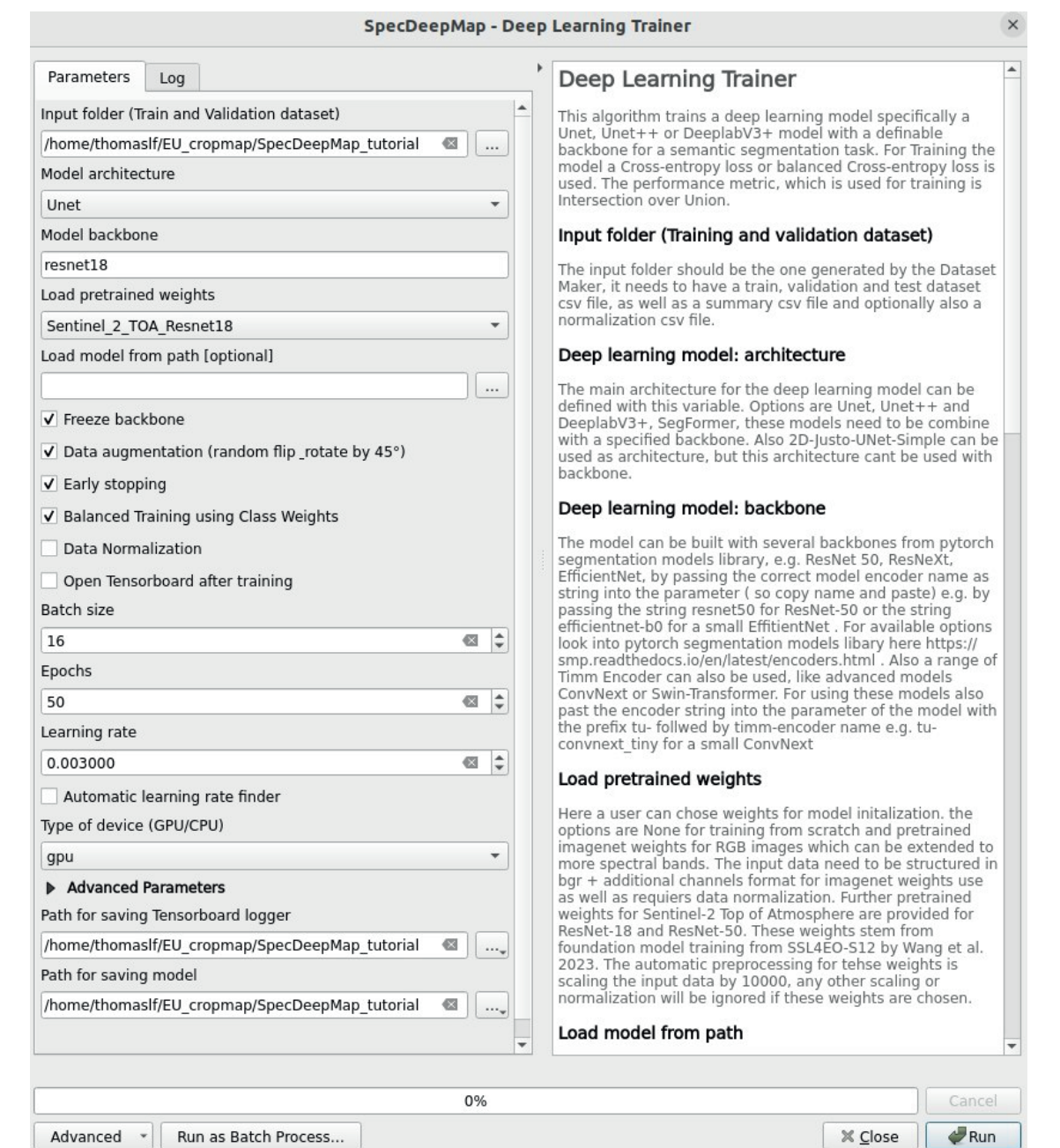


The EnMAP-Box adds more than 150 algorithms to the QGIS Processing Framework (left). These can be used in the QGIS Model Designer (middle) to create and share models. Algorithms and models can be started from QGIS or EnMAP-Box (right), from python and command line interfaces.



Thematic applications like "Interactive Visualization of Vegetation Reflectance Models" (top, IVVRM, Danner et al. 2018), the "Spectral Imaging Deep Learning Mapper" (SpecDeepMap, left, Thomas in prep.) or the "EnMAP Processing Tool" (EnPT, Scheffler 2023) expand the EnMAP-Box with a variety of features.

Scan the QR code to access an overview of all EnMAP-Box applications and related publications.



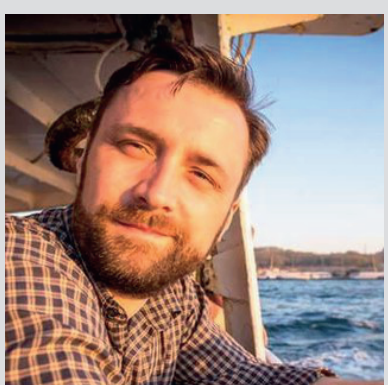
References

- Jakimow et al. 2023. EnMAP-Box: Imaging spectroscopy in QGIS. SoftwareX 23, 101507.
- Chabrilat et al. 2024. The EnMAP spaceborne imaging spectroscopy mission: Initial scientific results two years after launch. Remote Sensing of Environment 114379.
- Documentation <https://enmap-box.readthedocs.io>
- Code [git@github.com:EnMAP-Box/enmap-box.git](https://github.com:EnMAP-Box/enmap-box.git)
- Mail enmapbox@enmap.org

Roadmap

- 10/2025 EnMAP-Box 3.17: cloud-free EnMAP composites
- 04/2024 EnMAP-Box 3.18: match-up tool to load EnMAP profiles for point locations from cloud data sources
- 10/2026 EnMAP-Box 3.19: 3D visualization of spectral-temporal surfaces

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für Forschung, Technologie
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Funded by the German Space Agency at the German Aerospace Center (DLR) with funds from the Federal Ministry of Research, Technology and Space (BMFT) on the basis of a resolution of the German Bundestag under funding code 50EE2401A.



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