

TOWARDS FAST MORPHOLOGICAL MOSAICKING OF HIGH-RESOLUTION MULTI-SPECTRAL PRODUCTS – ON IMPROVEMENTS OF SEAMLINES

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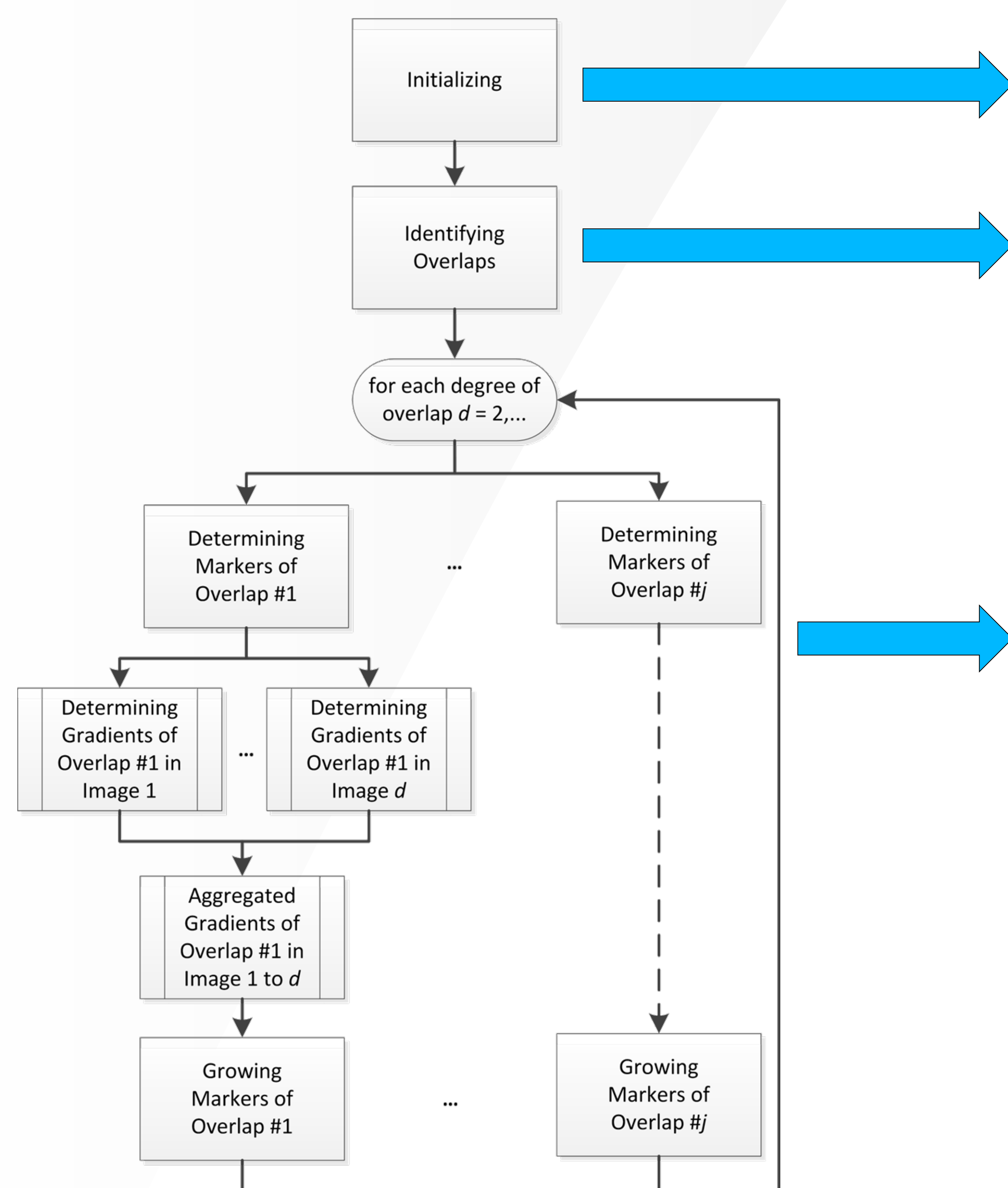
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Abstract

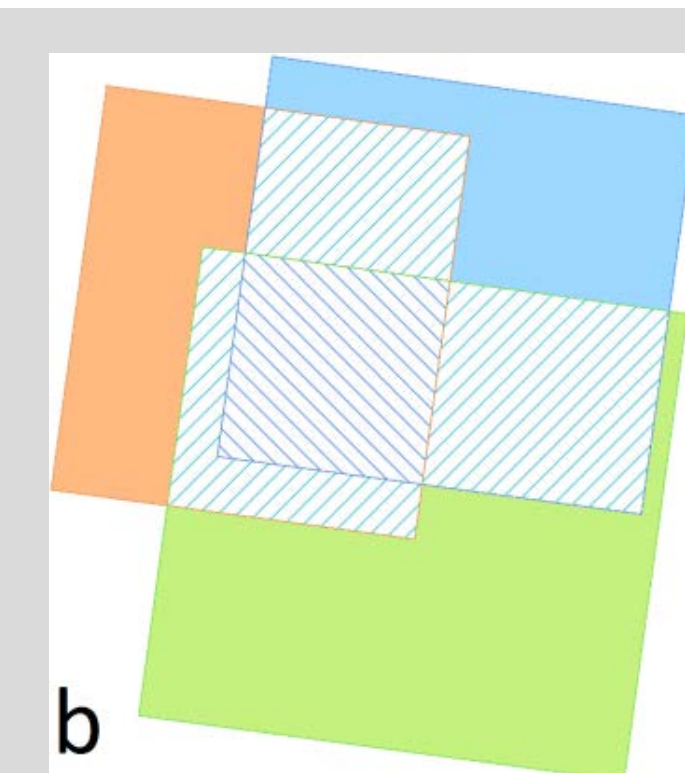
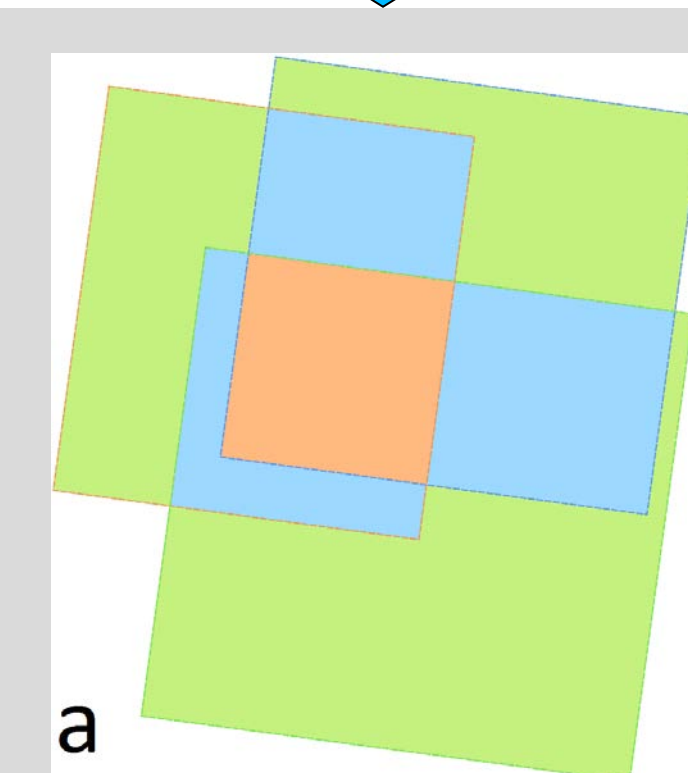
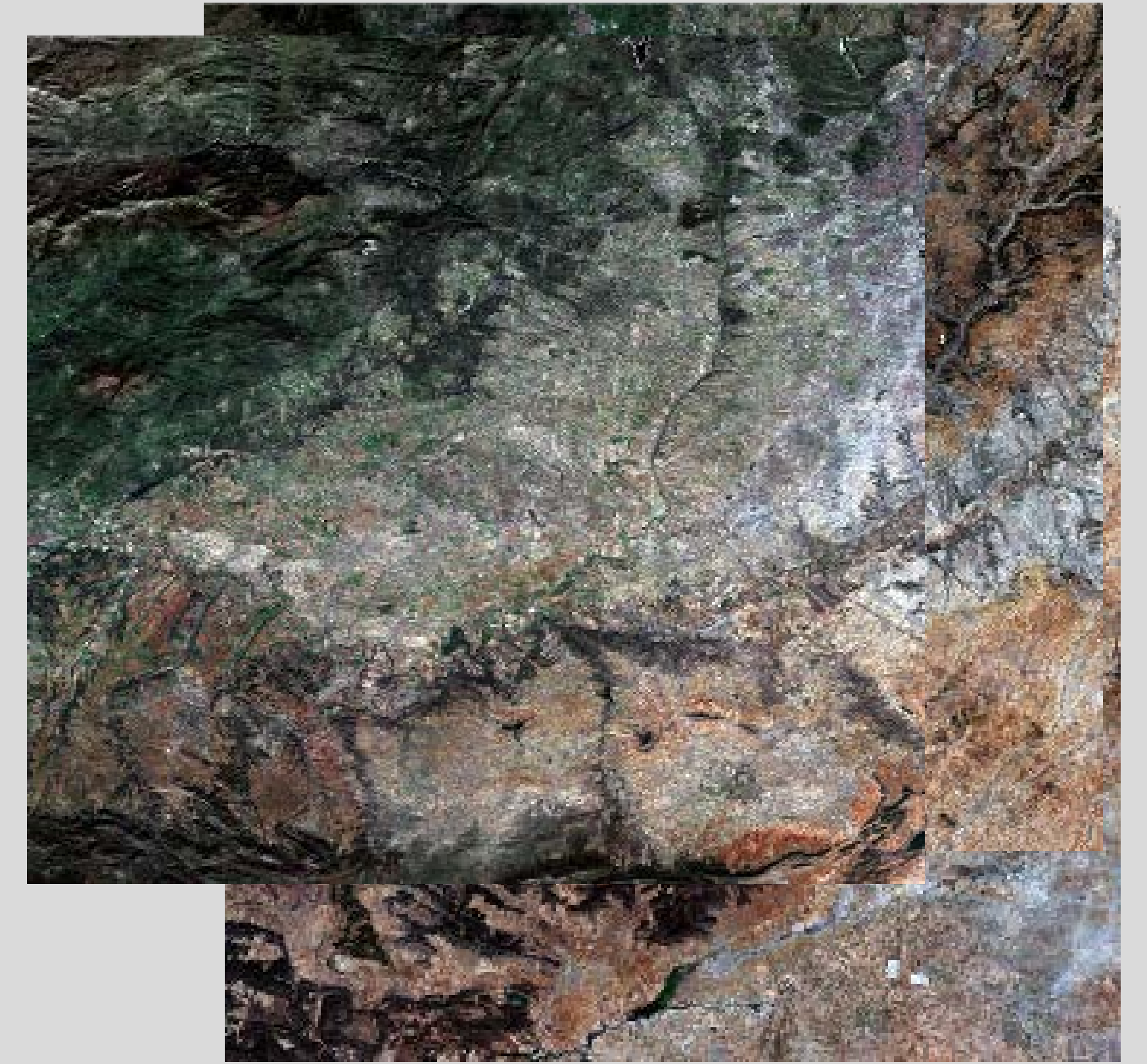
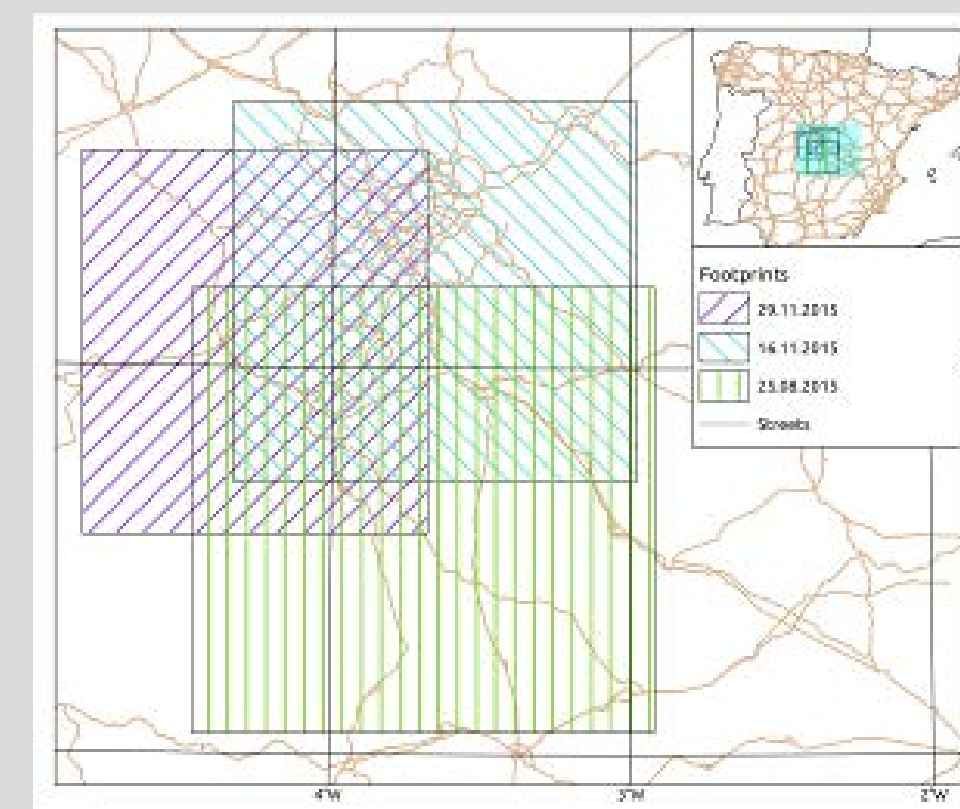
We propose and analyze an algorithm for image mosaicking of high-resolution orthorectified products based on morphological image processing which is especially fully automatic and highly efficient with a quasi-linear (also called log-linear) runtime. Such a runtime is a key factor for the timely provision of European or global mosaics.

The quality of the image mosaic is probably strongest influenced by the gradient images used for seamline estimation. Future work will consider the determination of gradients based, e.g., on land cover and land use, classification or cluster results that are estimated based on the images themselves – essentially combined with data of the OpenStreetMap project.

In future developments it's envisaged to tailor the algorithm more strictly to the specifications of the Sentinel-2 mission.



Right) Three overlapping S2 scenes used for experiment, further experiments were carried out using Landsat 8, SPOT 5, Resourcesat, etc. Bottom) Map of Footprints of S2 scenes used for demonstration purposes.



Preprocessing: Identification of all overlapping regions, the degree of overlap and the images corresponding to the single overlaps. In the following the single overlaps are sequentially processed, ordered by the degree of overlap, starting from 1, 2, 3, ..., n overlaps.

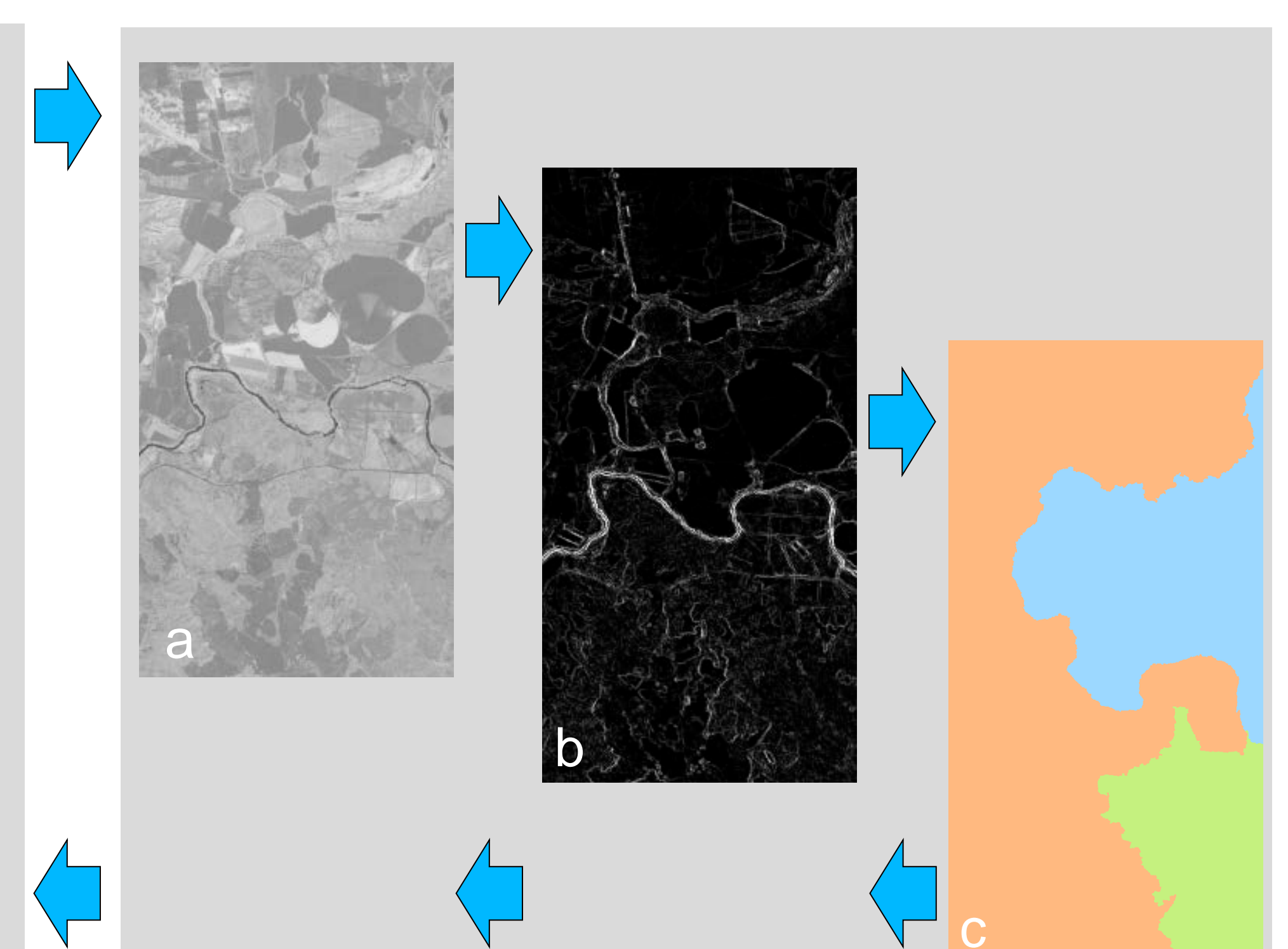
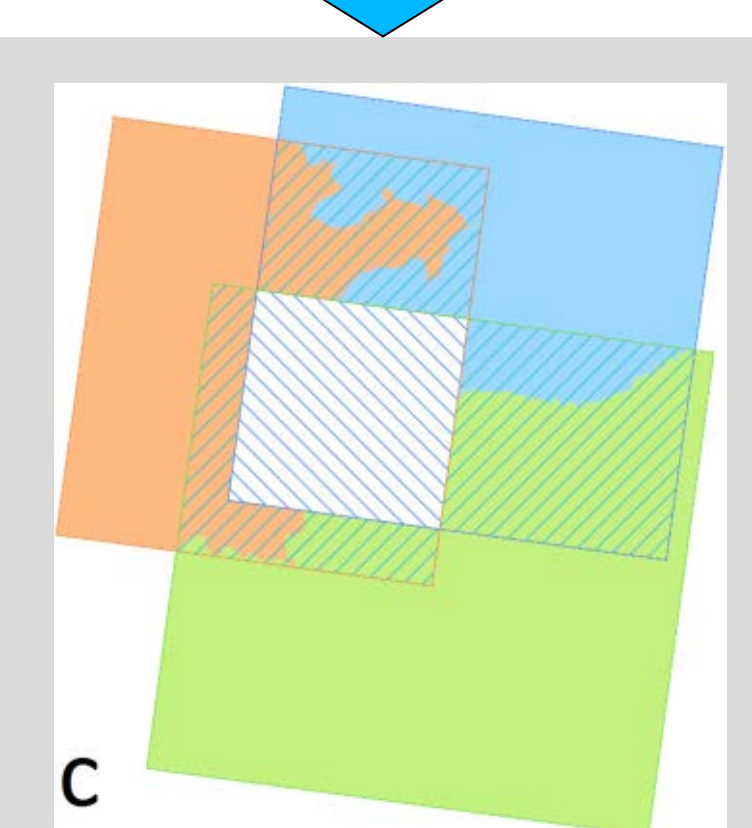
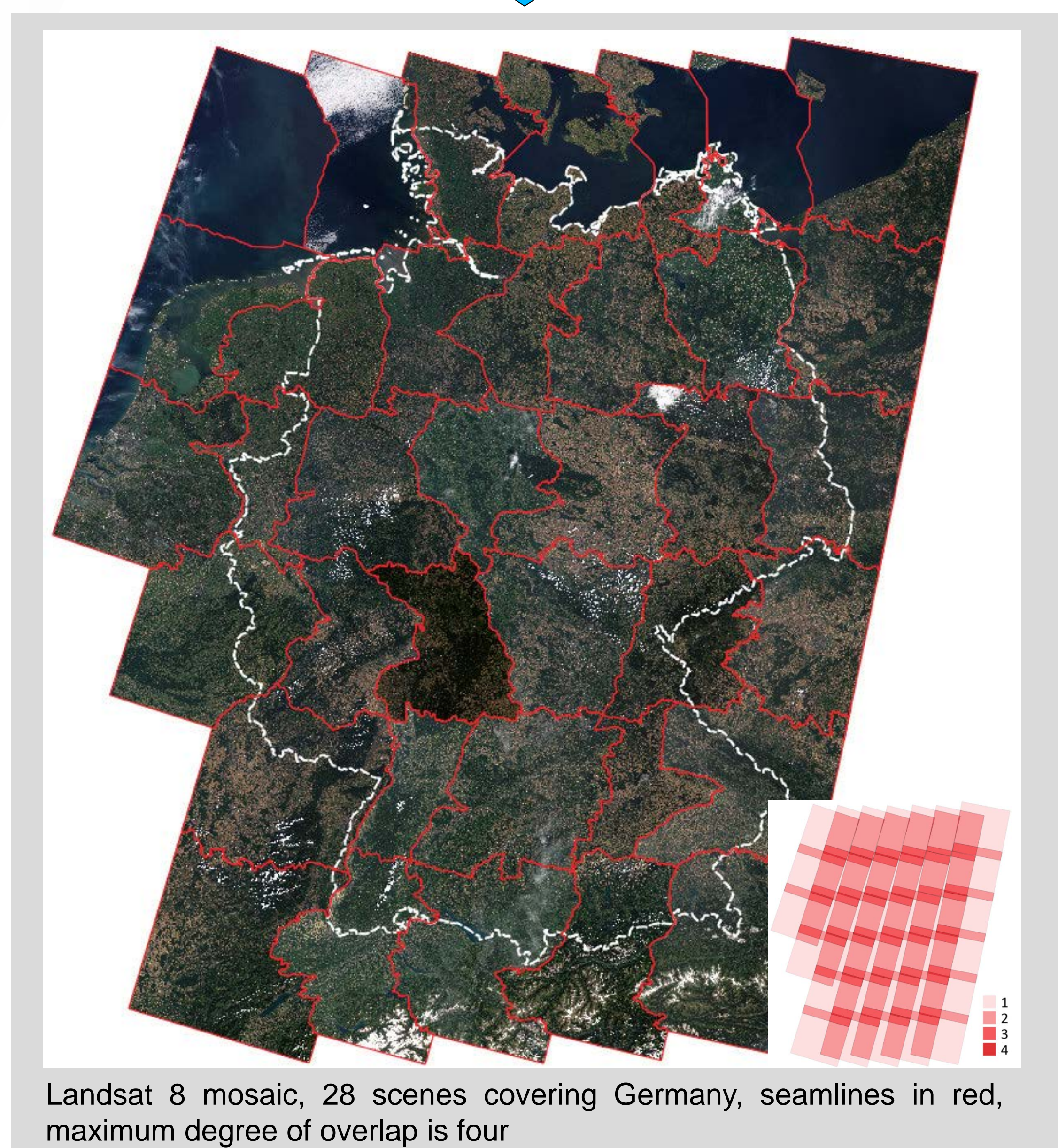
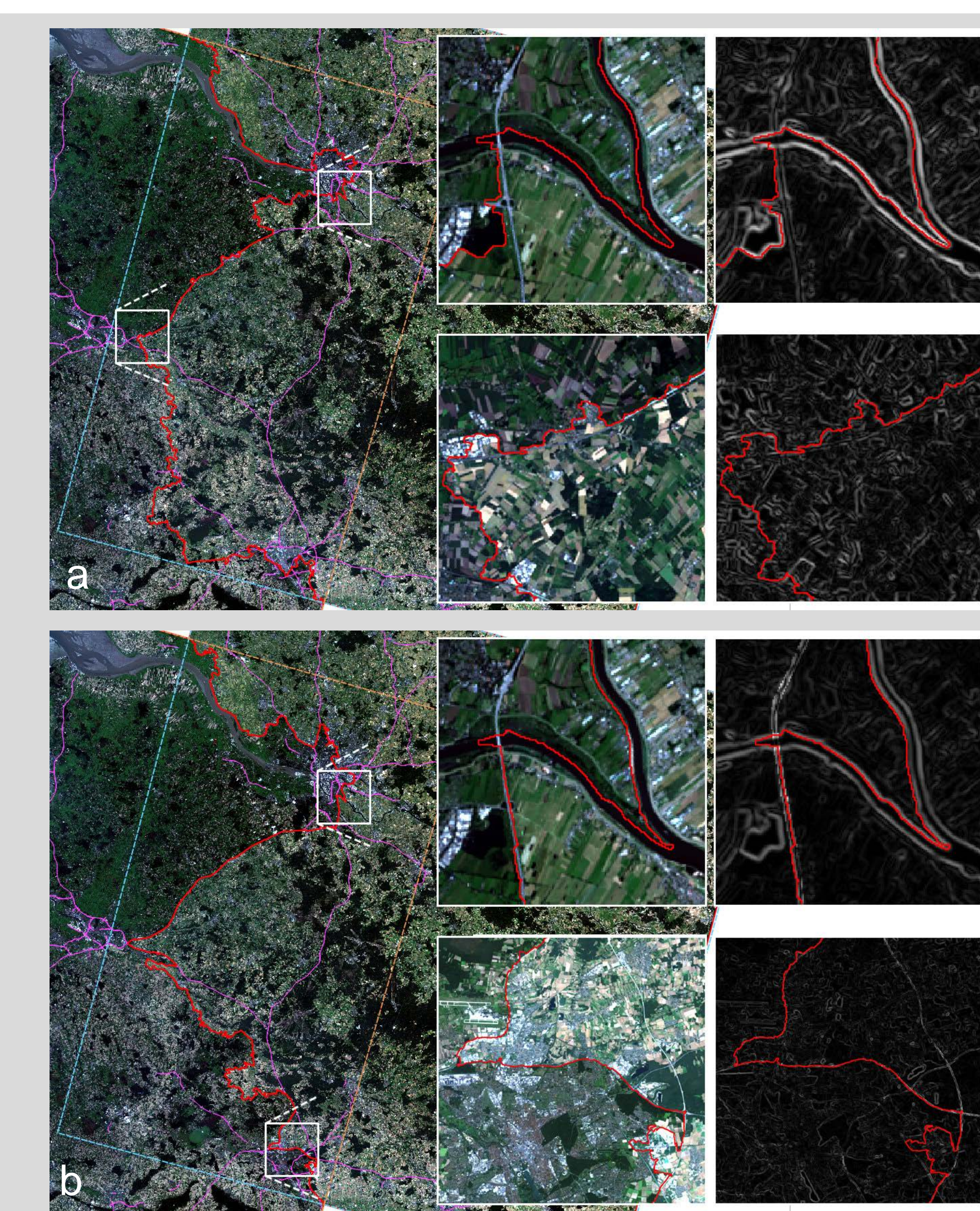


Illustration of process of morphological image mosaicking. a) single channel of image, b) gradient image, c) final mosaik markers obtained from growing initial markers on aggregated gradient image.



Landsat 8 mosaic, 28 scenes covering Germany, seamlines in red, maximum degree of overlap is four



a) Overlapping scenes, gradient images based on NDVI, seamlines in red, roads in purple

b) Overlapping scenes, gradient images based on NDVI multiplied with binary road network. Roads in purple, seamlines in red.

