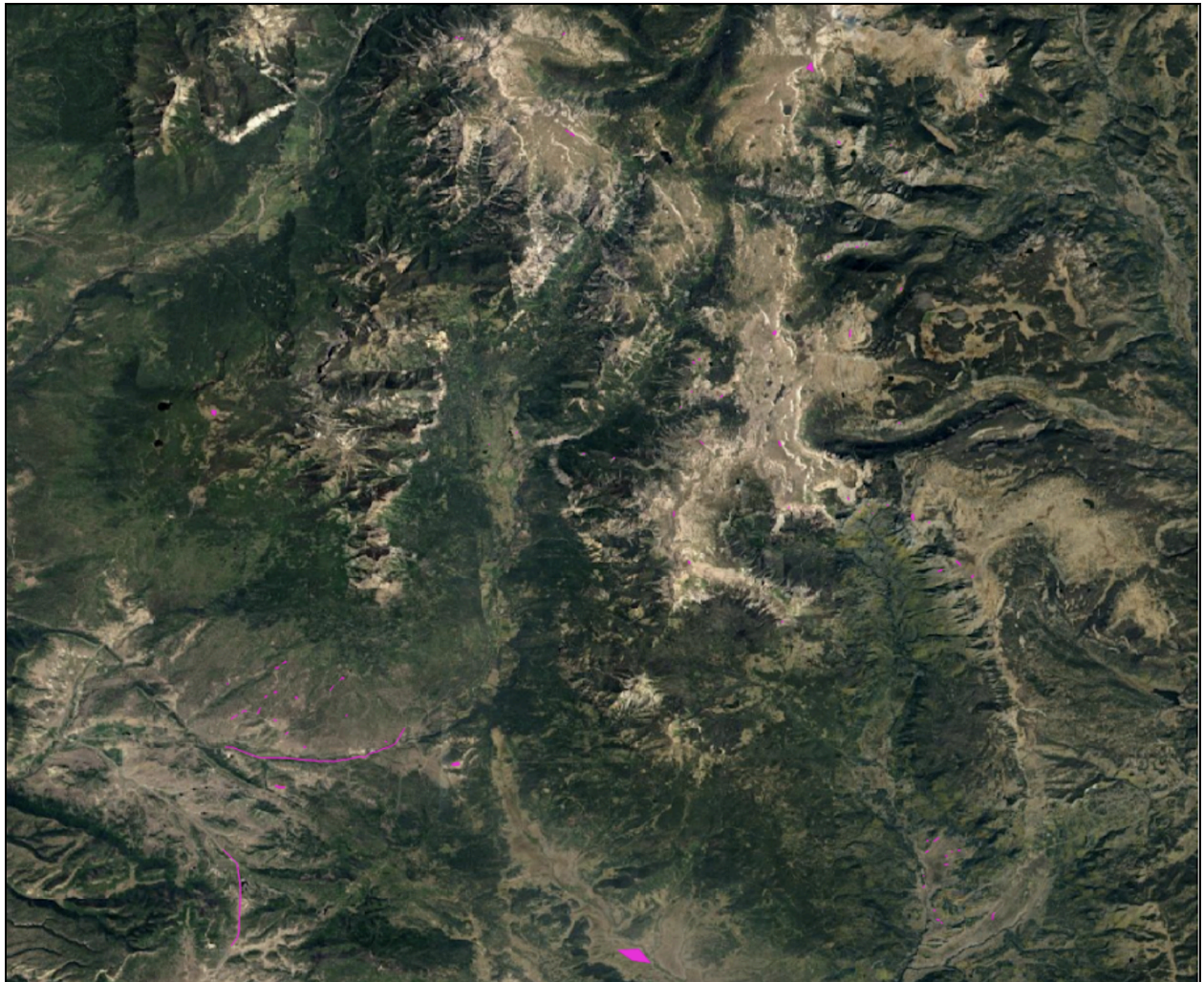
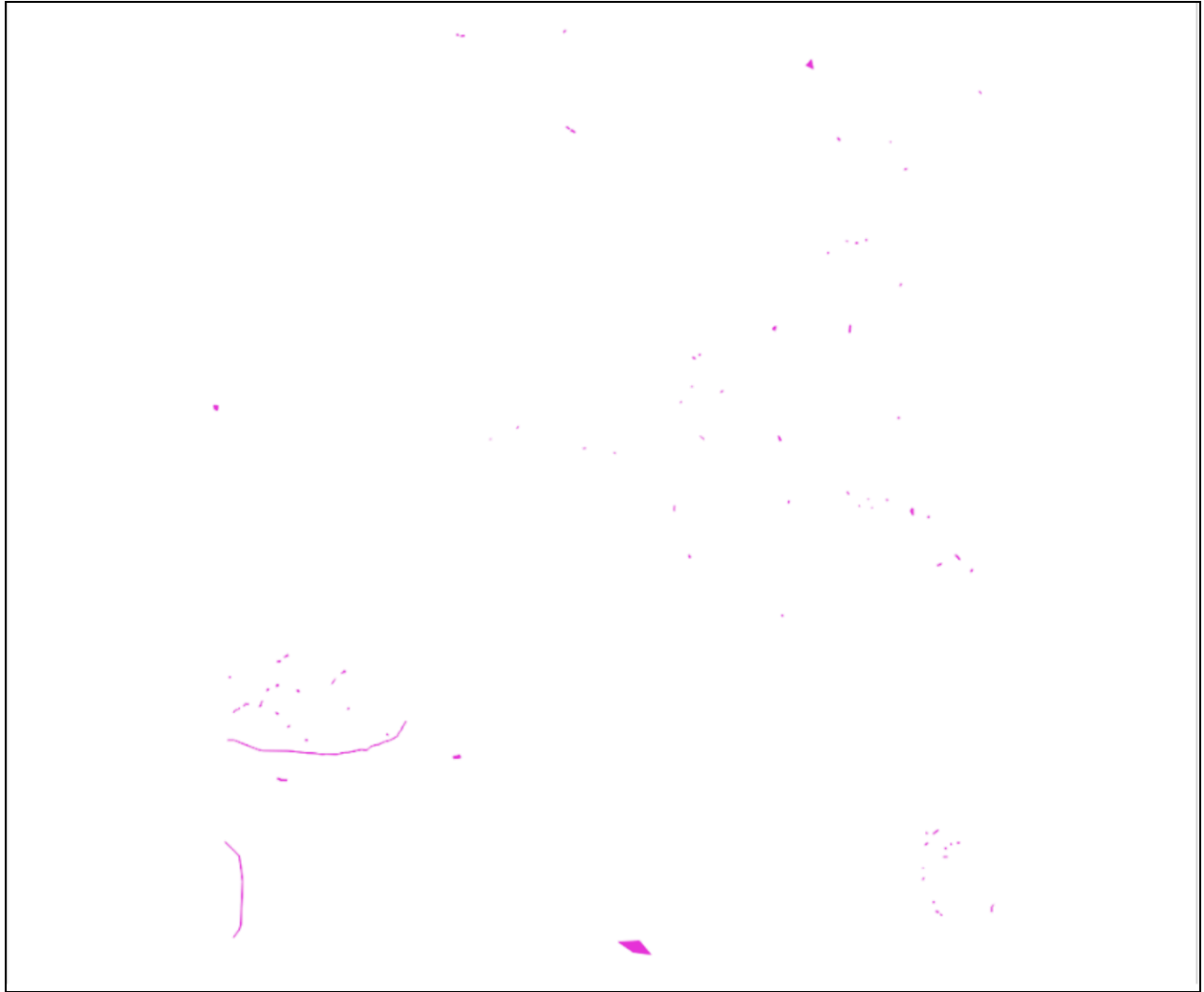


# Known issues in Banded Peak Ranch SnowEx Colorado 3M Snow Depth DEM Time Series from High-Resolution Satellite Image Pairs

- Thin clouds present in March 16, 2022 acquisition may have affected the ability to resolve surface texture, generating more noise in the resulting snow depth product
- Undulating artifacts due to unmodeled satellite pointing error (“jitter”) with vertical magnitude of up to +/-30 cm are present in all collections, and visible in the April 9, 2022 collection. Additional reprocessing, using latest stereo correction routines (e.g., [https://stereopipeline.readthedocs.io/en/latest/tools/jitter\\_solve.html](https://stereopipeline.readthedocs.io/en/latest/tools/jitter_solve.html)) could mitigate these artifacts.
- The discrete stereo correlation kernel size (9x9 px) resulted in “smoothing” of edges in the WV DSMs, especially along canopy edges. As a result, snow depth values may be biased high along canopy edges and within small gaps between trees. These gap artifacts may be reduced with a minimum area threshold filter.

Snow-free control surfaces used for final round of vertical co-registration

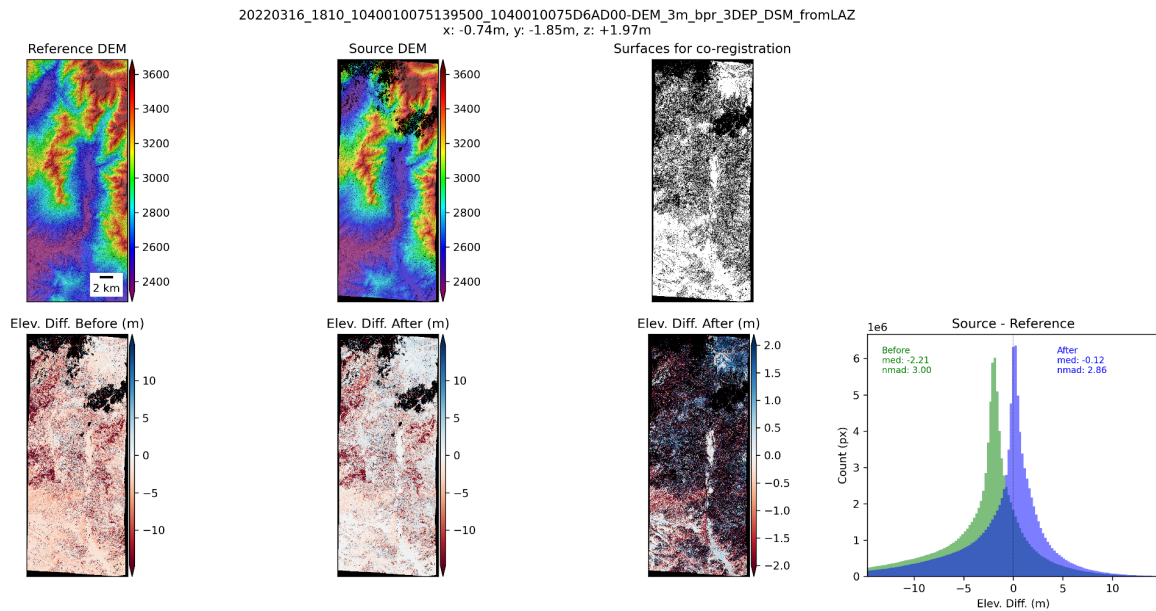




# Co-registration details

March 16, 2022

Initial 3D translation co-registration (includes some snow-covered surfaces):



Secondary vertical-only translation (constrained to manually identified control surfaces):

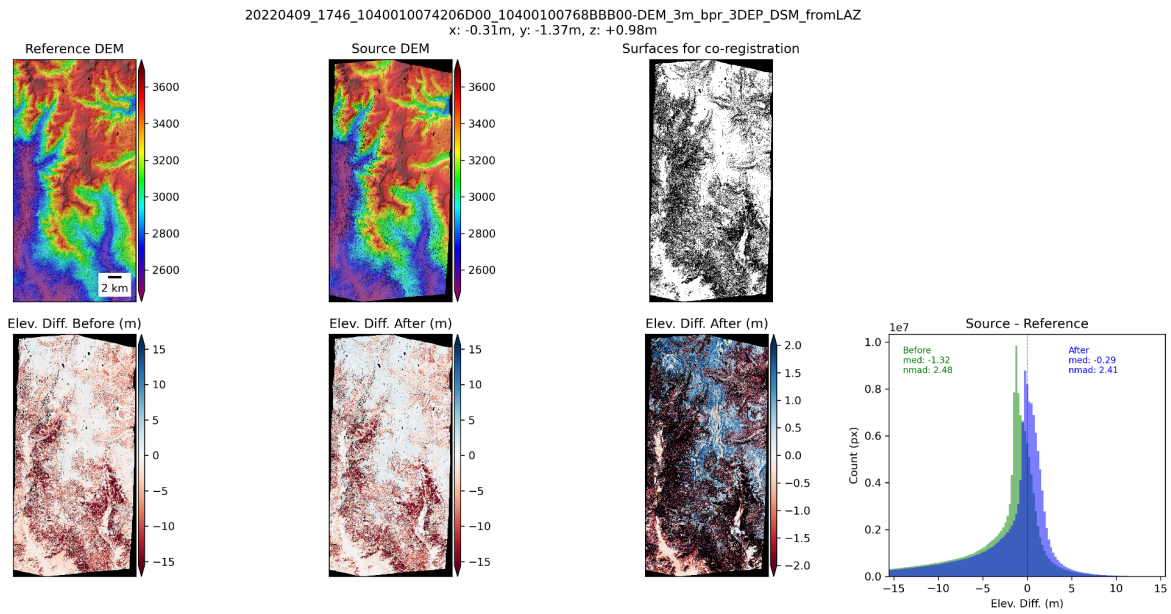
Secondary z shift applied: +0.26 m

Net z shift from starting position: +2.23 m

Final NMAD over control surfaces: 0.22 m

April 9, 2022

Initial 3D translation co-registration (includes some snow-covered surfaces):



Secondary vertical-only translation (constrained to manually identified control surfaces):

Secondary z shift applied: +0.40 m

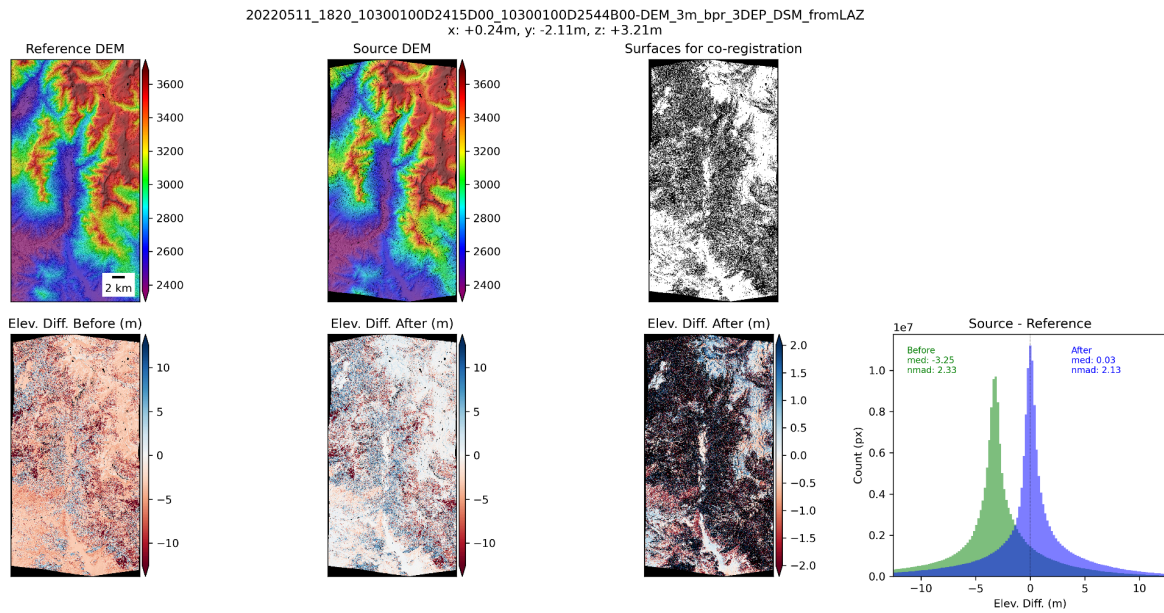
Net z shift from starting position: +1.38 m

Final NMAD over stable surfaces: 0.15 m



May 11, 2022

Initial 3D translation co-registration (includes some snow-covered surfaces):



Secondary vertical-only translation (constrained to manually identified control surfaces):

Secondary z shift applied: +0.13 m

Net z shift from starting position: +3.34 m

Final NMAD over stable surfaces: 0.26 m