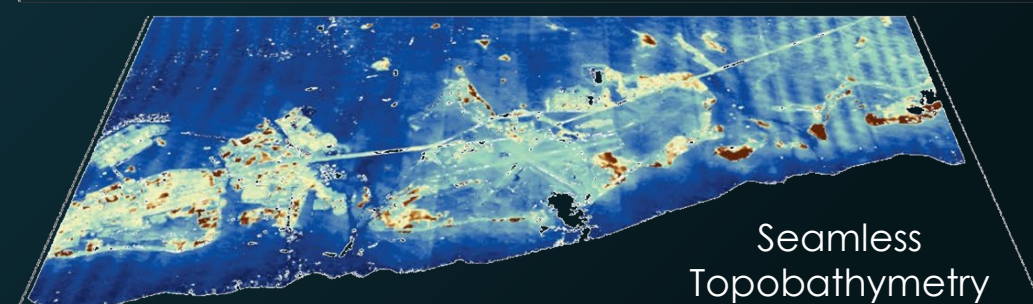
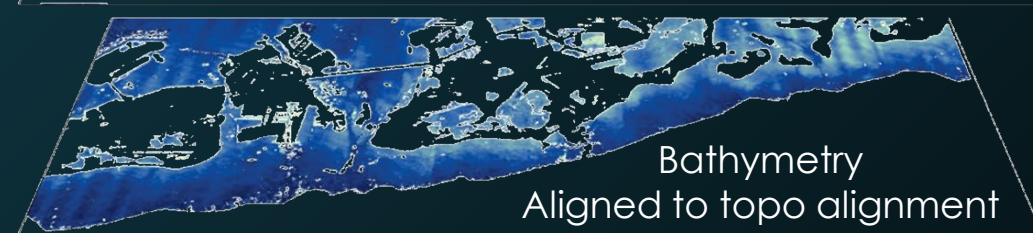
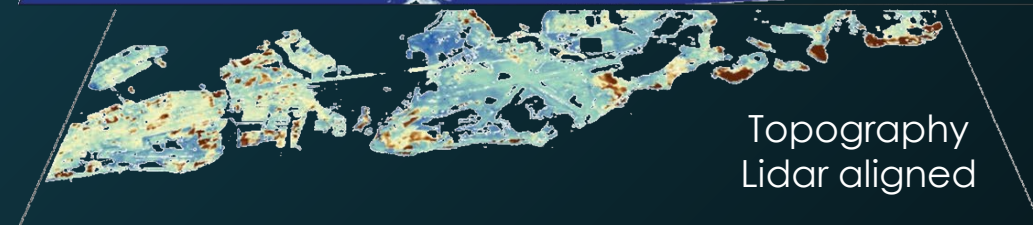


# Open-source satellite derived bathymetry module for NASA Ames Stereo Pipeline

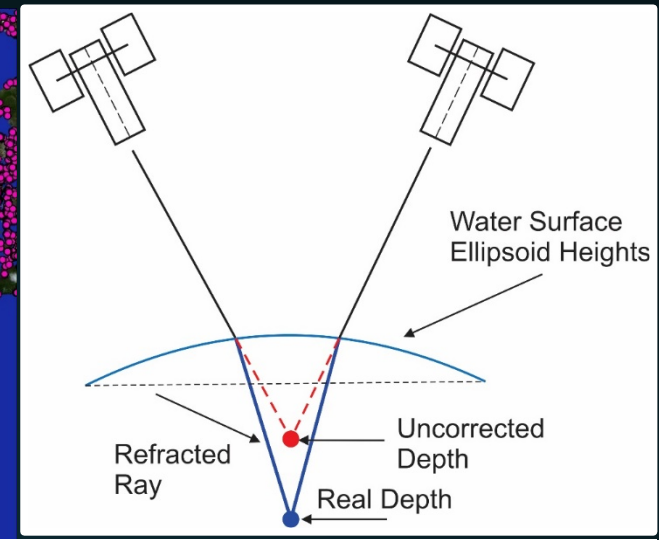
Monica Palaseanu-Lovejoy, USGS GMEG  
Oleg Alexandrov, NASA Ames  
Jeff Danielson, USGS EROS



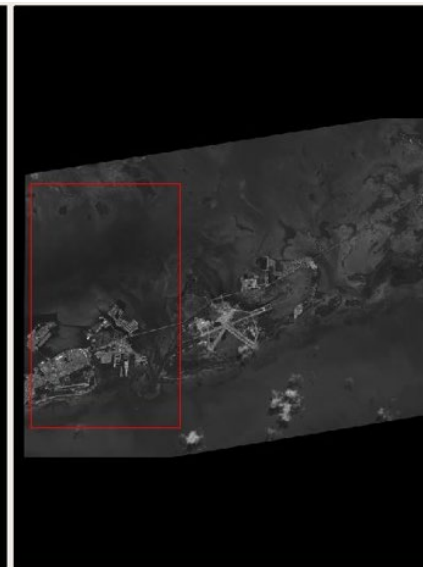
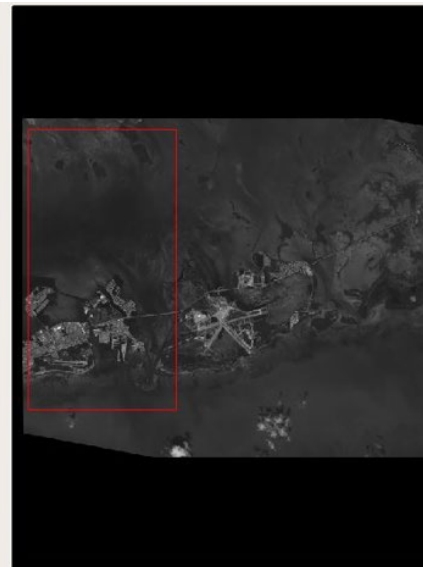


# Bathymetry module NASA Ames Stereo Pipeline

- Active development
- Blue, Green and PAN bands
- NIR1 / NIR2 used for land/water mask
- Land/water thresholds:
  - KDE minima (fully implemented)
  - Otsu (development)
- Water elevation surface (local stereographic projection)
  - Interactive: Stereo GUI
  - Automatic: land/water mask
- Water refraction index:
  - General: 1.34, 1.33
  - Location specific
- 3D Reconstruction:
  - Topography
  - Bathymetry
  - Topobathymetry

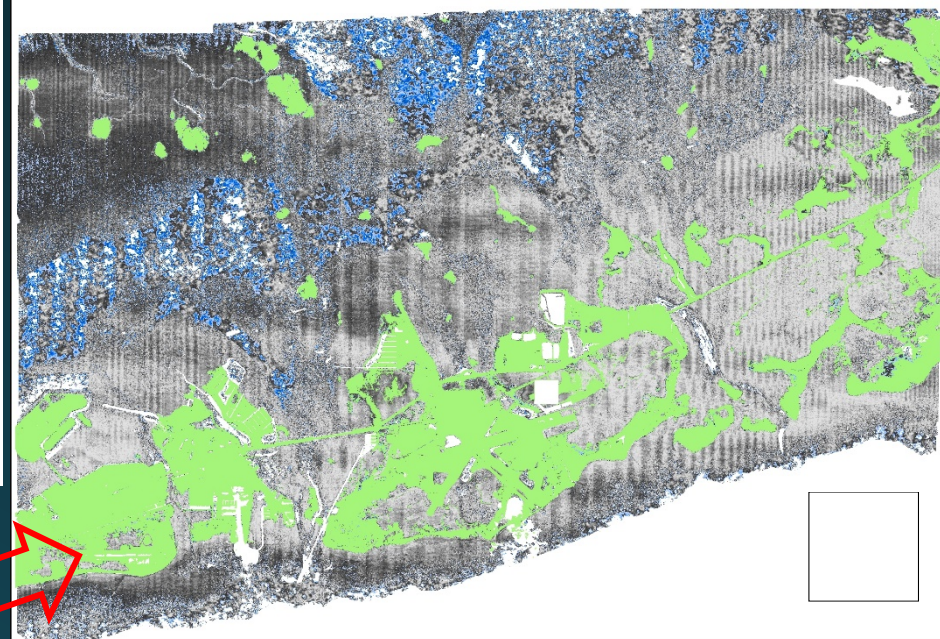
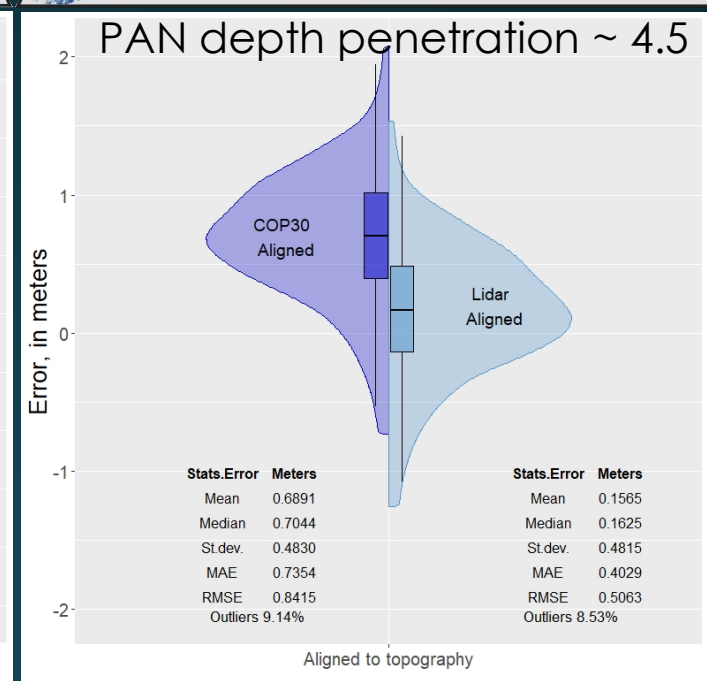
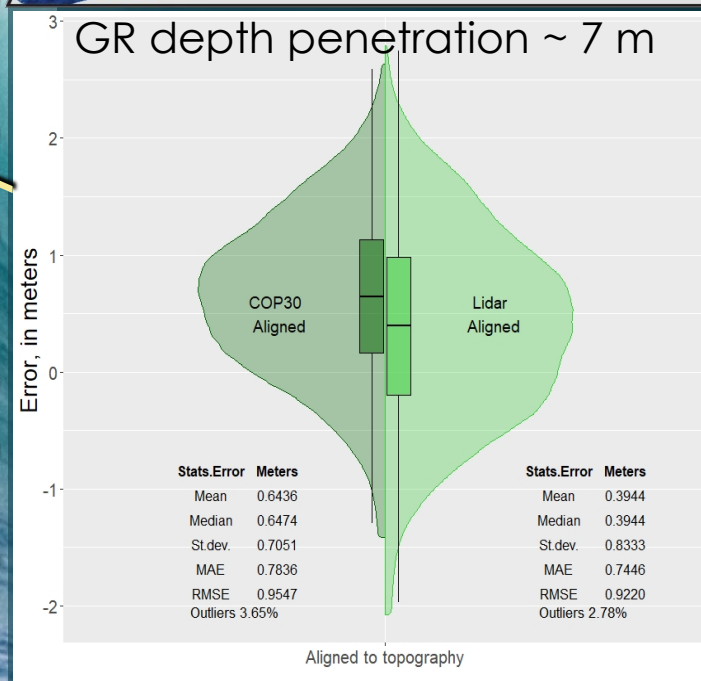
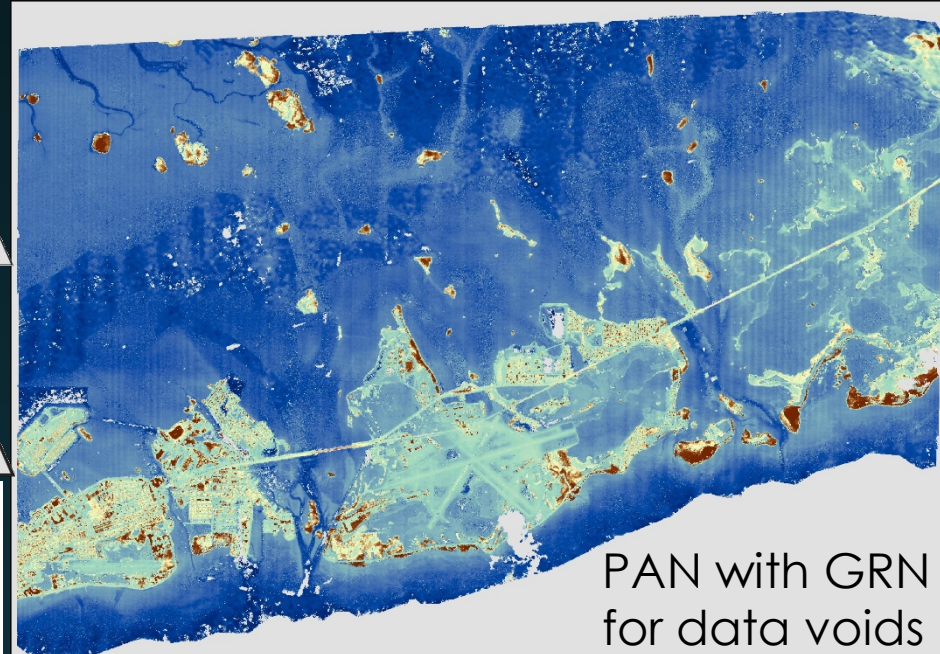
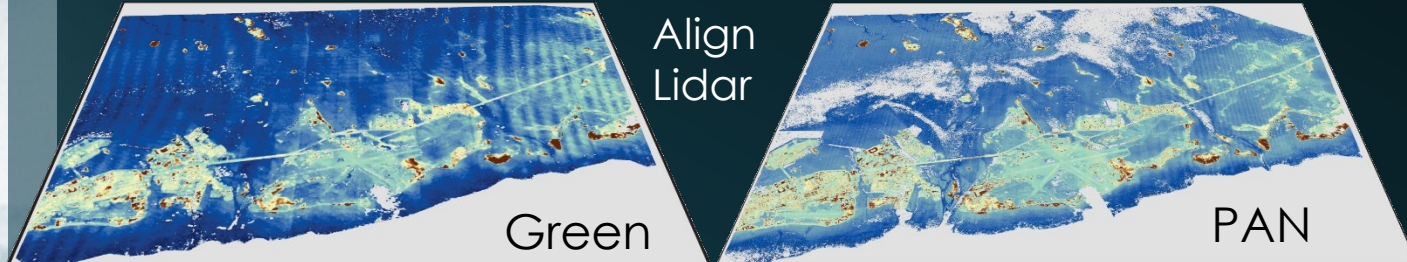


```
Found 6810 / 30000 inliers.  
Max distance to the plane (meters): 17.3824  
Max inlier distance to the plane (meters): 0.199918  
Mean plane height above datum (meters): -24.8876  
Writing: mask_plane/GRplaneL_lim02_nr30k.txt  
Writing inlier shapefile: shape_mask/GRshapeL_lim02_nr30k.shp
```





# Bathymetry module Florida Keys Results



| Stats. Error | Meters |
|--------------|--------|
| Mean         | 0.2474 |
| Median       | 0.2341 |
| St.dev.      | 0.5749 |

| Stats. Error | Meters |
|--------------|--------|
| MAE          | 0.4918 |
| RMSE         | 0.6258 |

Absolute errors, m





# Questions?

## Resources:

Active development of NASA ASP w/ bathy module:

<https://github.com/NeoGeographyToolkit/StereoPipeline/releases>

User Manual:

<https://stereopipeline.readthedocs.io/en/latest/introduction.html>

GMEG SC: <https://www.usgs.gov/centers/gmeg>

EROS SC: <https://www.usgs.gov/centers/eros>

EROS CoNED: <https://www.usgs.gov/core-science-systems/eros/coned>

NASA ASP: <https://ti.arc.nasa.gov/tech/asr/groups/intelligent-robotics/ngt/stereo/>

# Thank You!

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