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# The Accuracy of SRTM Water Body Data over the Turkish Territory with Respect to Topographic Maps

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# Introduction

- On February 2000, in terms of SRTM, Space Shuttle Endeavour was launched into space.
- The shuttle acquired data for near-global high-resolution digital elevation data of the Earth.
- 1 and 3 arc-second DEM's were created and made available.
- The SRTM Water Body Data (SWBD) is generated by subsequent data editing by the National Geospatial-Intelligence Agency (NGA, US) to produce the finished SRTM Digital Terrain Elevation Data Level 2 (DTED 2).

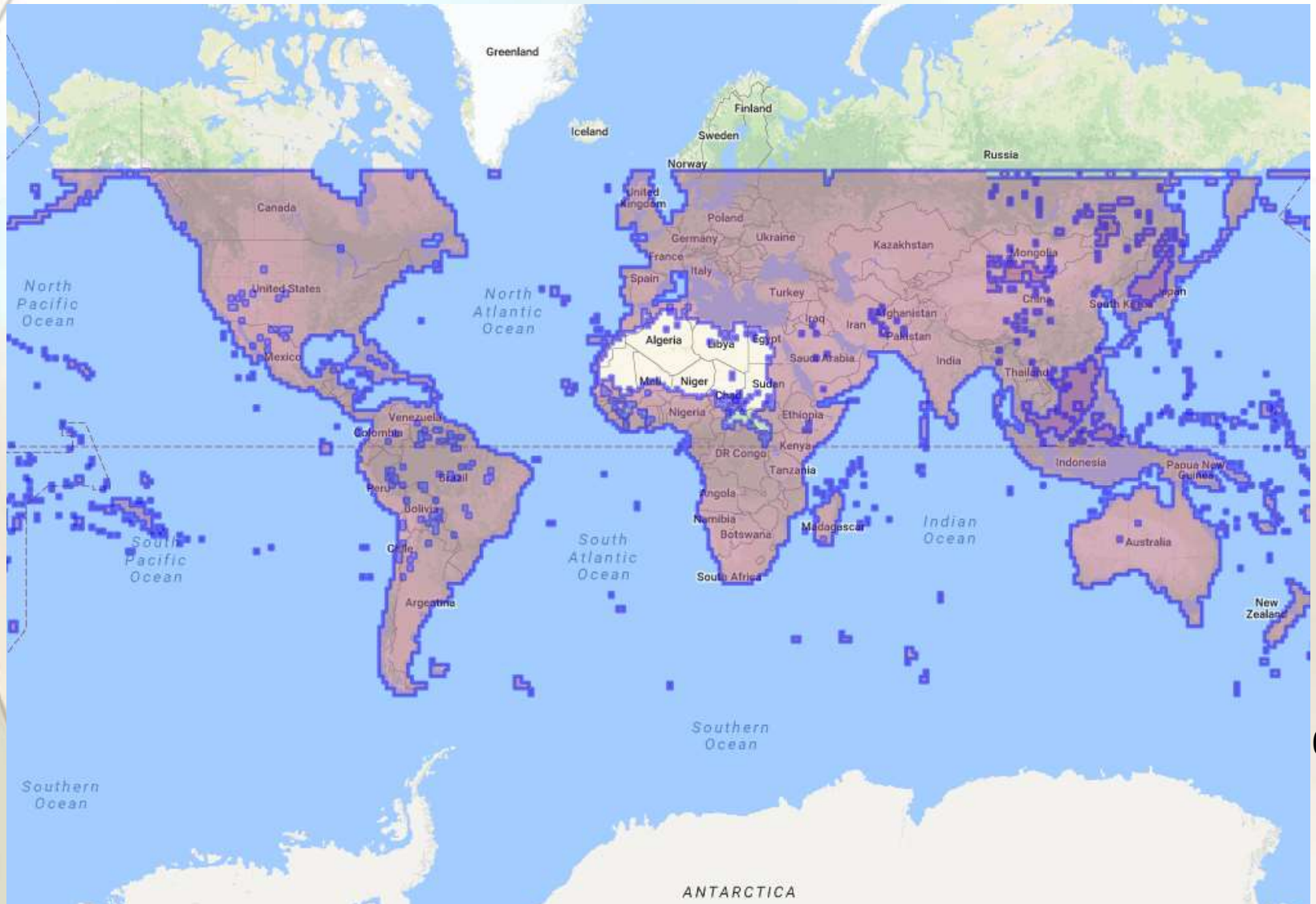
# SRTM Data Products

- SRTM 1 Arc-Second Global
  - DEM with void data
- SRTM Non-Void Filled
  - DEM with void data
  - 3 Arc-Second resolution
- SRTM Void Filled
  - DEM without void data
  - 3 Arc-Second resolution
- SRTM Water Body Data
  - Vector data
  - Based on 1 Arc-Second data

# SRTM Water Body Data (SWBD)

- The lines delineating water bodies are obtained from one arc second DEM according to SRTM data editing rules.
- A land cover water layer and medium-scale maps were used as additional data sources.
- Data format: ESRI Shape File
- Distribution: 1x1 degree tiles
- No line simplification/smoothing (zig-zag structure)
- Date: 2000
- Coverage: Land areas between  $\pm 60^\circ$  Latitudes

# SWBD Coverage



# A Tile on GE

E027N36



Google Earth

Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Image Landsat / Copernicus

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60 km



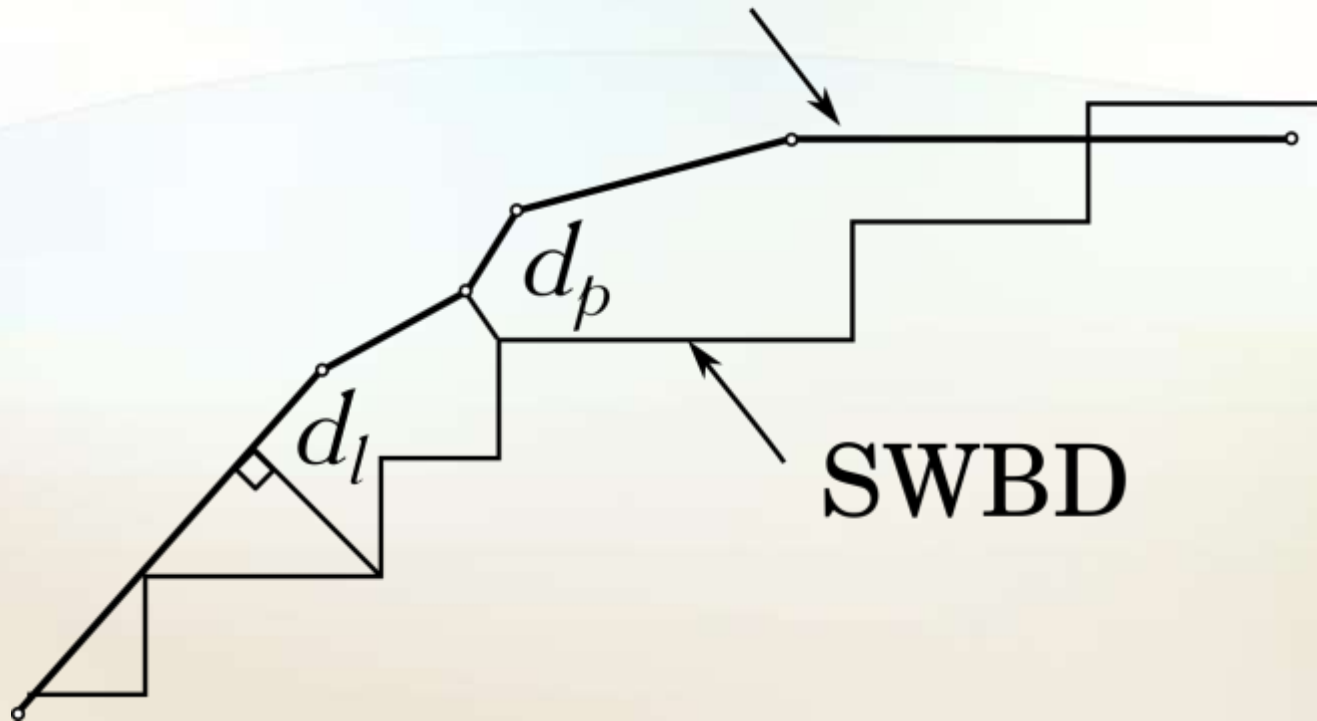


# Accuracy Check

- Selected parts of the data is checked against 25K topographic maps (Reference data)
- Reference data is obtained by manual digitizing.
- The distances from SWBD points to nearest lines or points of reference data are calculated.
- A statistical evaluation is performed.



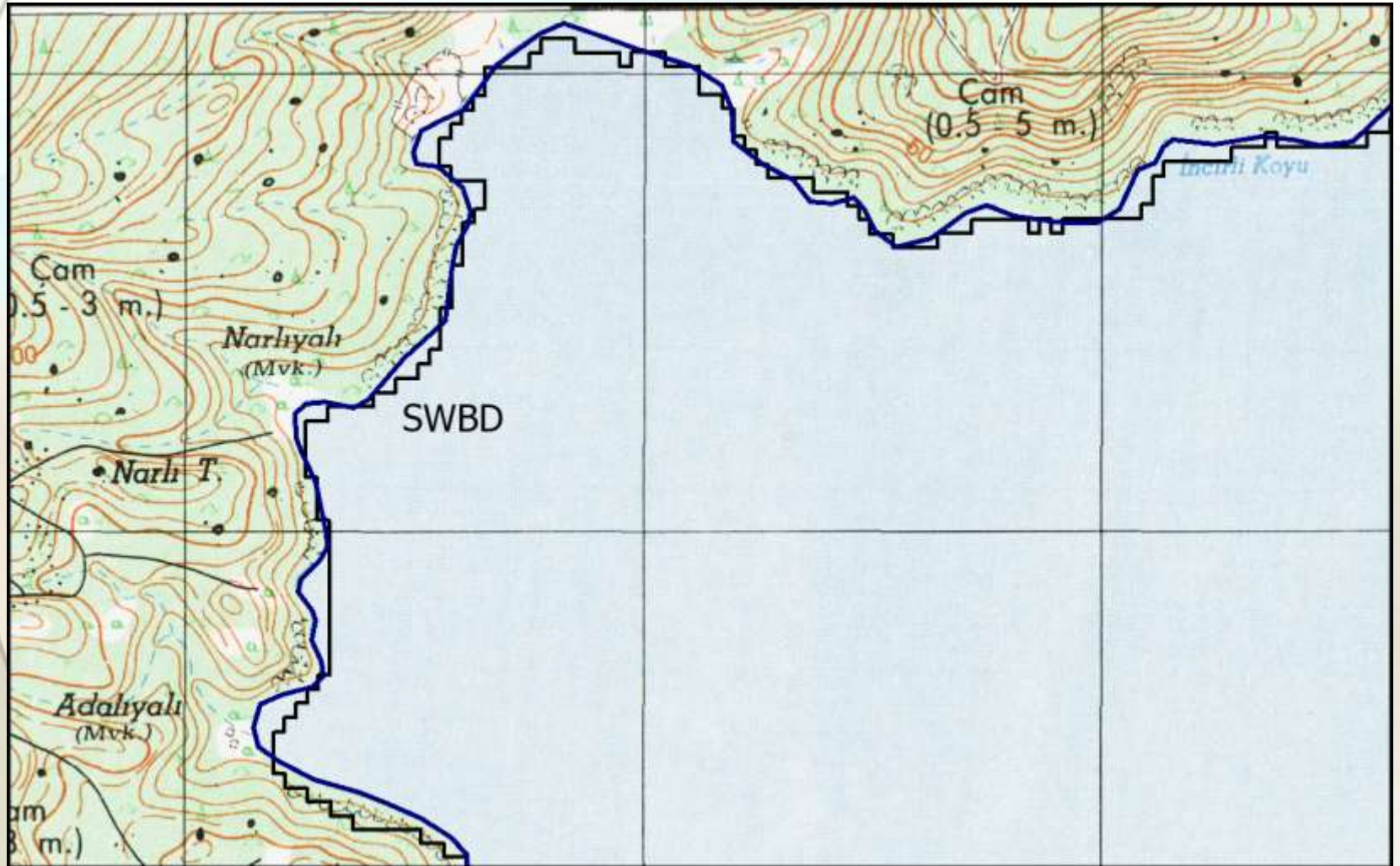
Reference Line



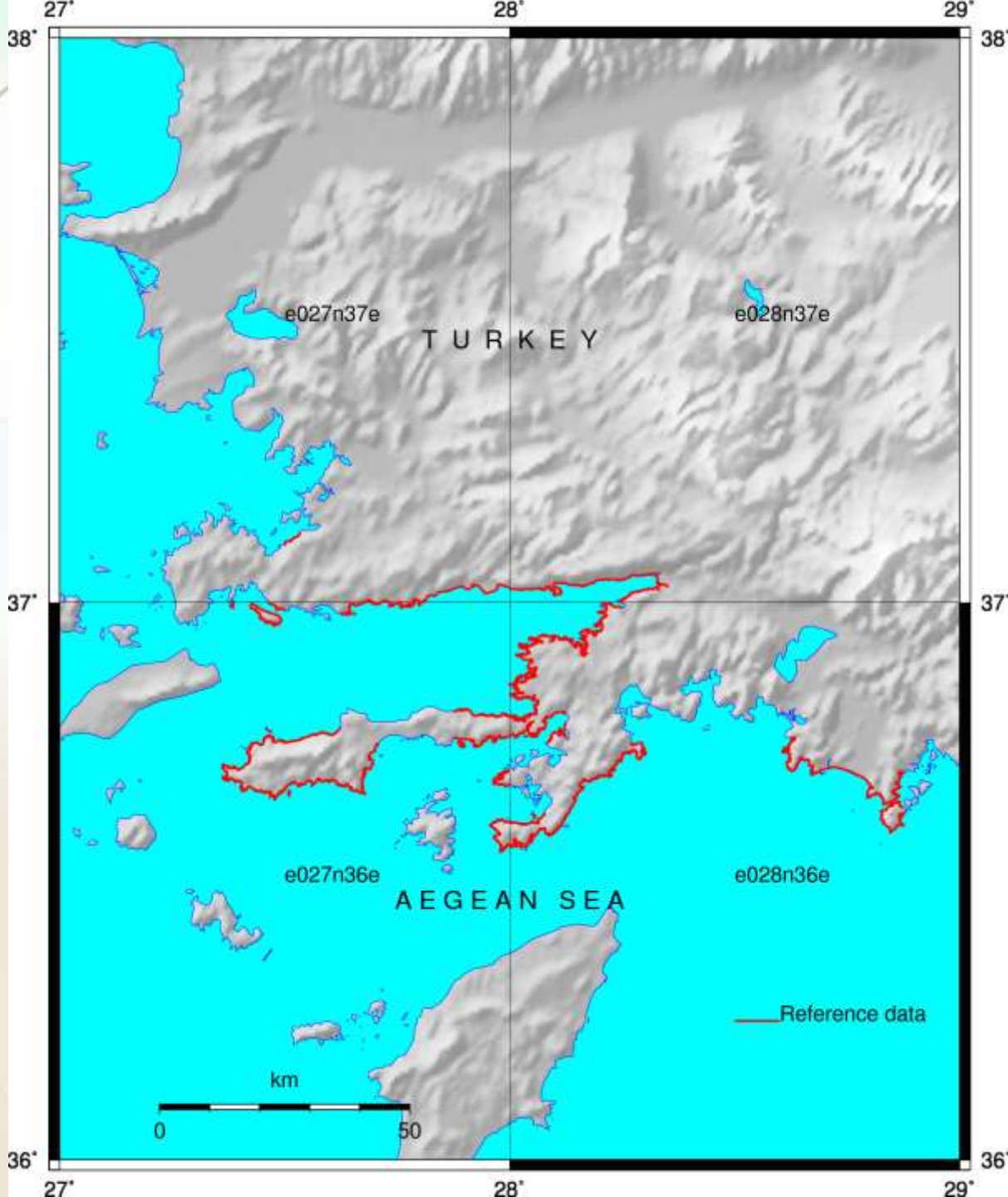
SWBD

- A test area covering 4 tiles is formed where coast lines are almost not changed.
- Nearest points or lines are searched within a search radius of 100m.
- Since the native coordinates of SWBD is geographical, the data is converted to equidistant cylindrical projection.
- Tests are performed with metric coordinates.
- A program with C language has been developed.

# 25K Maps & SWBD



# Test Area



30  
topographic  
sheets are  
used.

# Results

Tile	RMS (m)	Mean (m)	Max. Diff (m)	Min. Diff. (m)	Number of points
e027n36e	<b>34.28</b>	8.19	99.63	-99.36	4391
e027n37e	<b>33.68</b>	-12.81	99.83	-84.87	921
e028n36e	<b>34.51</b>	4.72	98.13	-99.30	1878
e028n37e	<b>42.96</b>	-15.96	99.19	-99.95	1173

The resolution of SRTM 1  $\approx$  30 m

# Conclusion

- The accuracy in test areas is approximately less than 1.5 times of spatial resolution.
- More checks are necessary.
- Available functions for line smoothing needs to be investigated.
- SRTM data dates back to February 2000, represents water bodies at that time. Change detection potential is important.

# Thank you for your attention!

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