



# Mode S Radar Coverage

Surveillance/MICA Workshop

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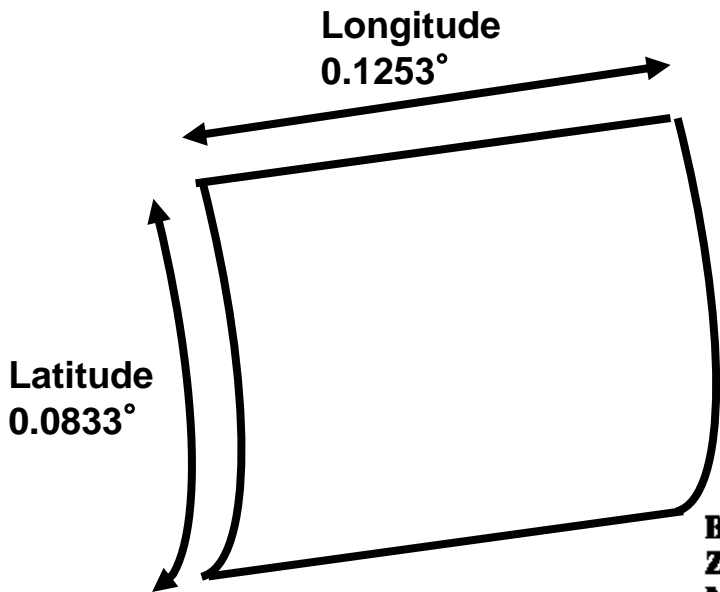
# Mode S radar coverage

- Coverage maps define the 3-D regions within which
  - surveillance of aircrafts is maintained (surveillance coverage)
  - aircrafts are lockout (lockout coverage)
- 3 formats of coverage maps
  - European Mode S (EMS) Coverage Map
  - Surveillance and Lockout range per sector
  - Surveillance and Lockout unique range (circular coverage)

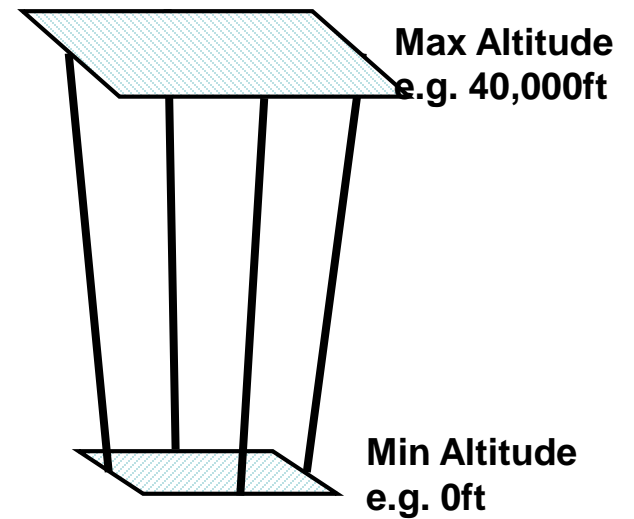
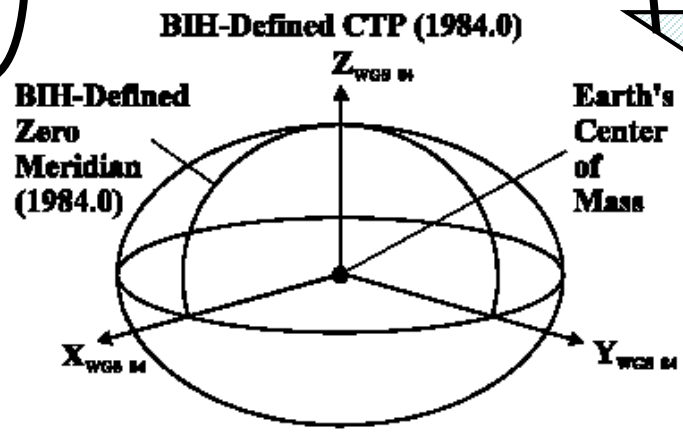
# European Mode S (EMS) Coverage Map

- Developed by EUROCONTROL in the frame of POEMS contract
- Geodesic maps (latitude/longitude)
  - Maps have the same common origin
    - Latitude 33° North and Longitude 15° West
  - Maps have the same cell size
    - $\Delta$ Latitude: 0.0833° and  $\Delta$ Longitude: 0.1253°
    - Cells 5NM x 5NM (around Latitude of Paris)
  - Vertical extent for each cell
- EMS Coverage maps allocated by the MICA Cell when supported by Mode S radar
- Lockout coverage is 1 cell smaller than the Surveillance coverage in IC allocations

# EMS Coverage Map Cell Definitions



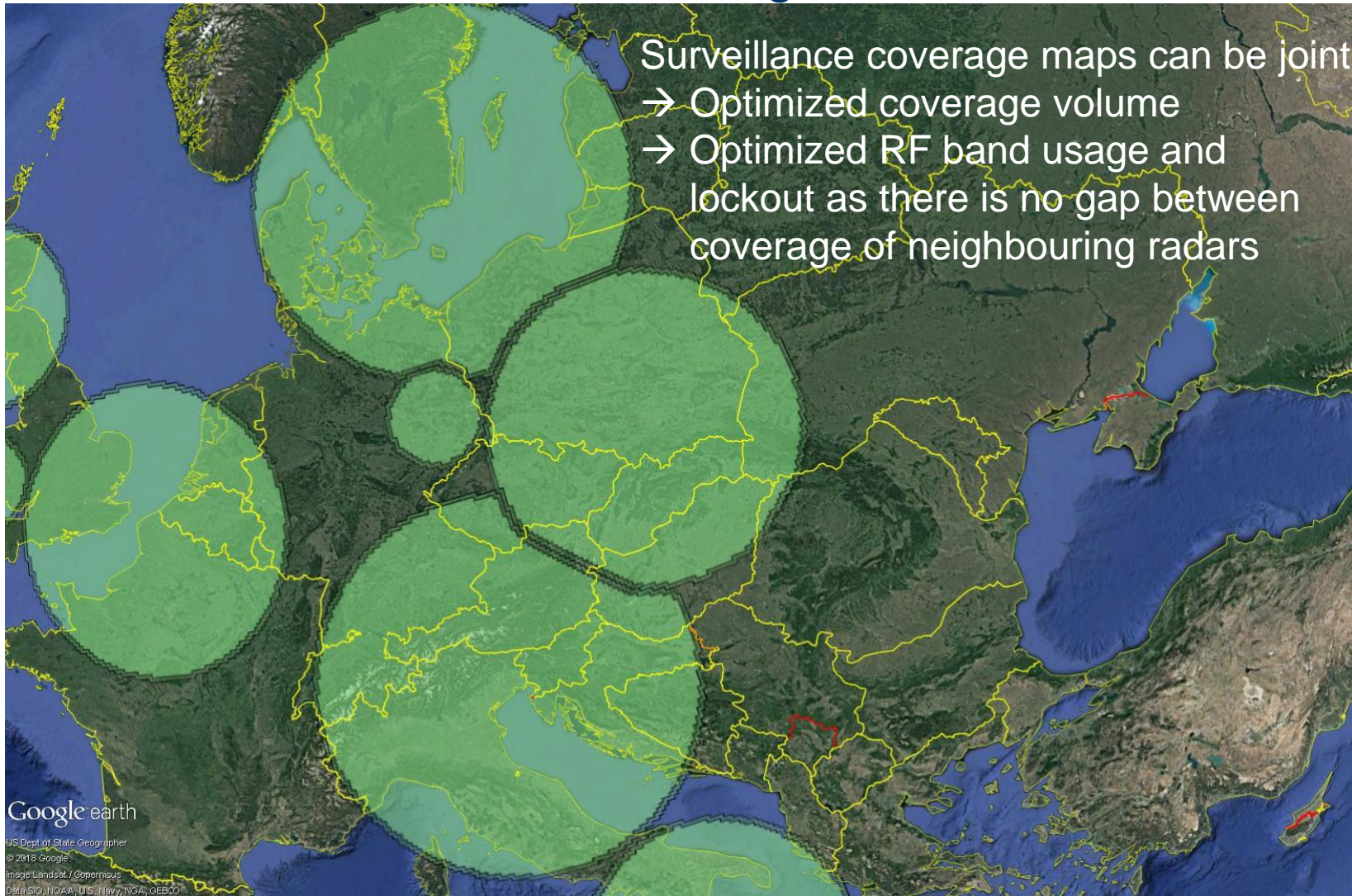
WGS 84 World Reference System



Nominal Cell Size of 5NM by 5NM

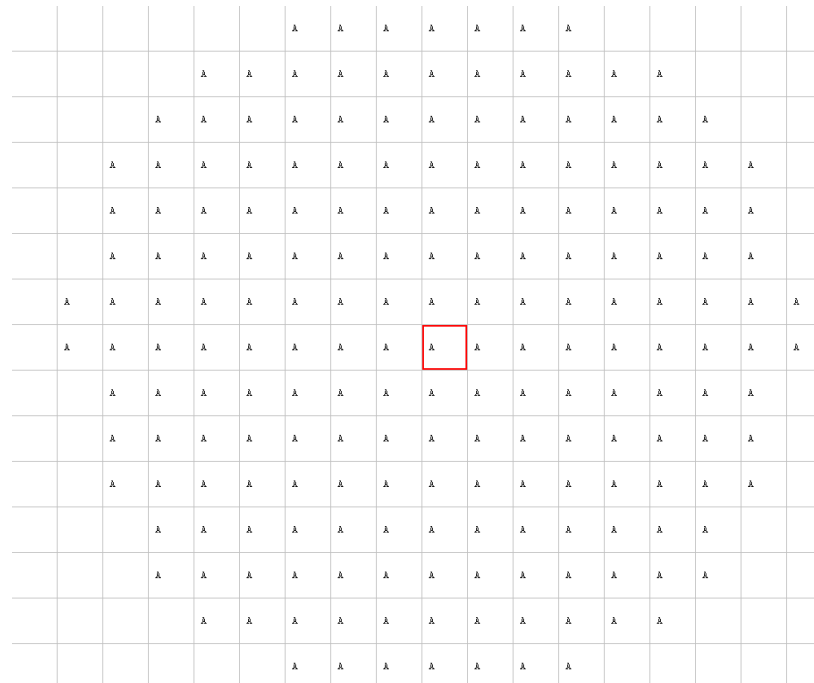
# Example of EMS Coverage Map

## Surveillance and Lockout coverage



# SMGET Tool

- EMS Coverage Map can be modified with SMGET tool
  - Here below is a screenshot of SMGET depicting the coverage of a radar having a range of 40NM.

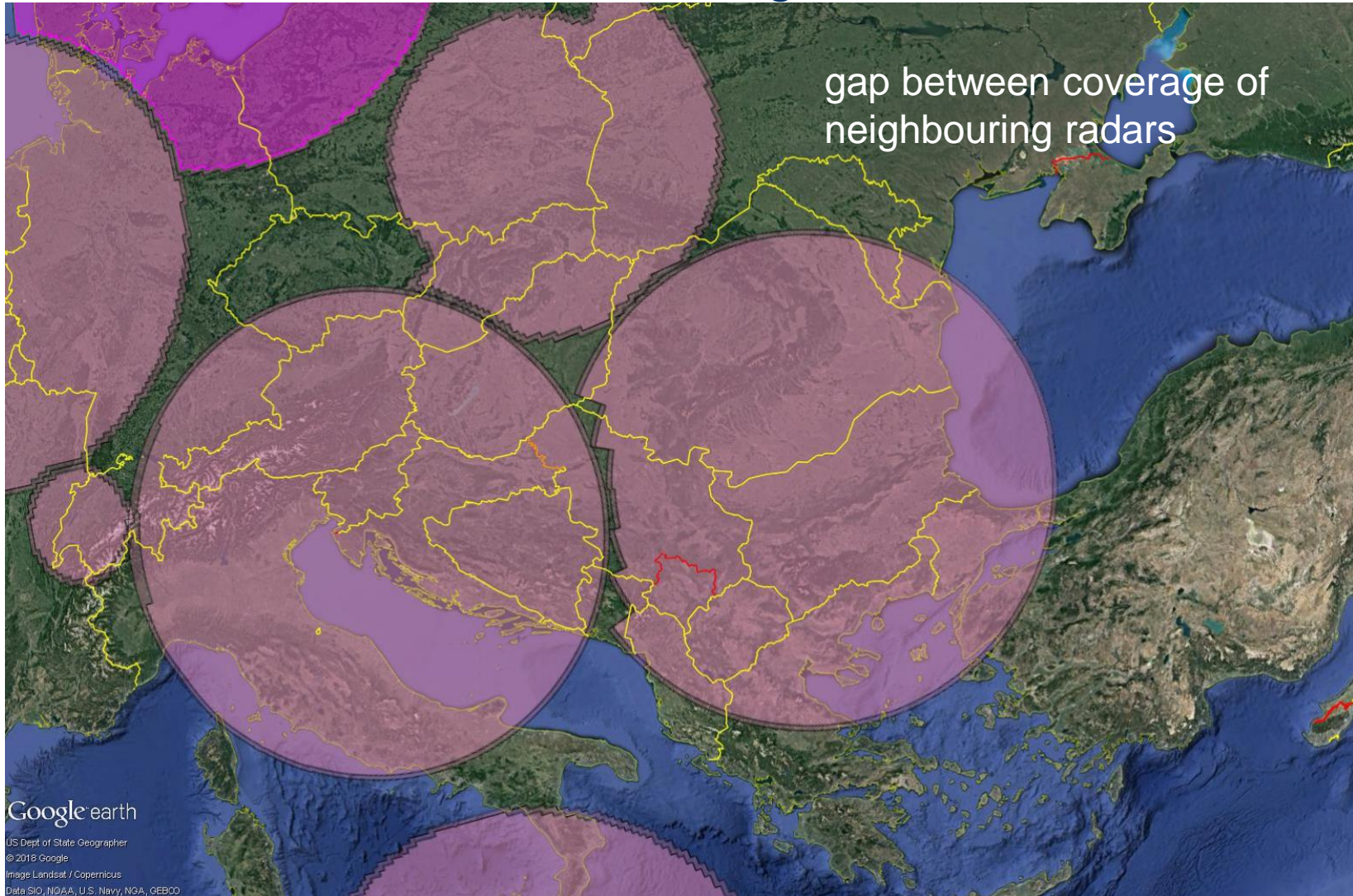


# Surveillance and Lockout Range per Sector

- Surveillance and Lockout coverage divided into sectors (e.g. 32 sectors of  $11.25^\circ$  )
- Surveillance and Lockout ranges provided by sector
- If EMS Coverage Map not supported by the radar, surveillance and lockout range per sector is allocated by the MICA Cell
- Lockout range is in general 5NM smaller than the Surveillance range in IC allocations



# Example of Range per Sector Surveillance and Lockout coverage





## Global Range for circular coverage

- One unique surveillance range and one unique lockout range
  - Circular coverage
  - Not flexible for IC allocation
- If EMS Coverage Map and Range per Sector not supported by the radar, surveillance and lockout global range is allocated by the MICA Cell