AVIATION SAFETY ANALYSIS AND GIS

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Safety Intelligence Objectives

- Create **actionable information** for use by decision makers in defining **aviation safety strategies**
- Identify targeted **areas of current and emerging risk** and develop specific alternatives to be considered for effective mitigation

Safety Intelligence Frameworks

ICAO INTEGRATED SAFETY Stars
TREND ANALYSIS AND REPORTING SYSTEM

http://www.icao.int/safety

- Accident, traffic, fleet and USOAP Audit Data
- Integrated safety analysis results

http://gis.icao.int

- Georeferenced Data visualization maps
- Routes, traffic and airspace maps

Accident Risk Model

Modifiable Areal Unit Problem (MAUP)

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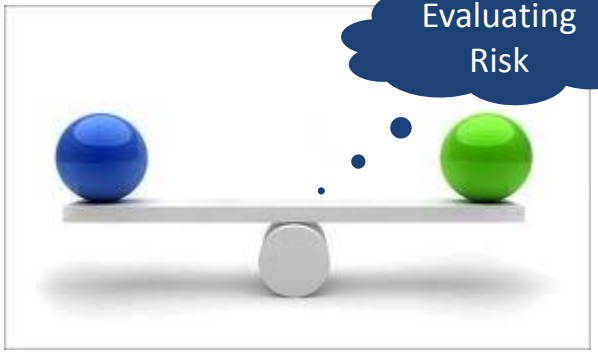
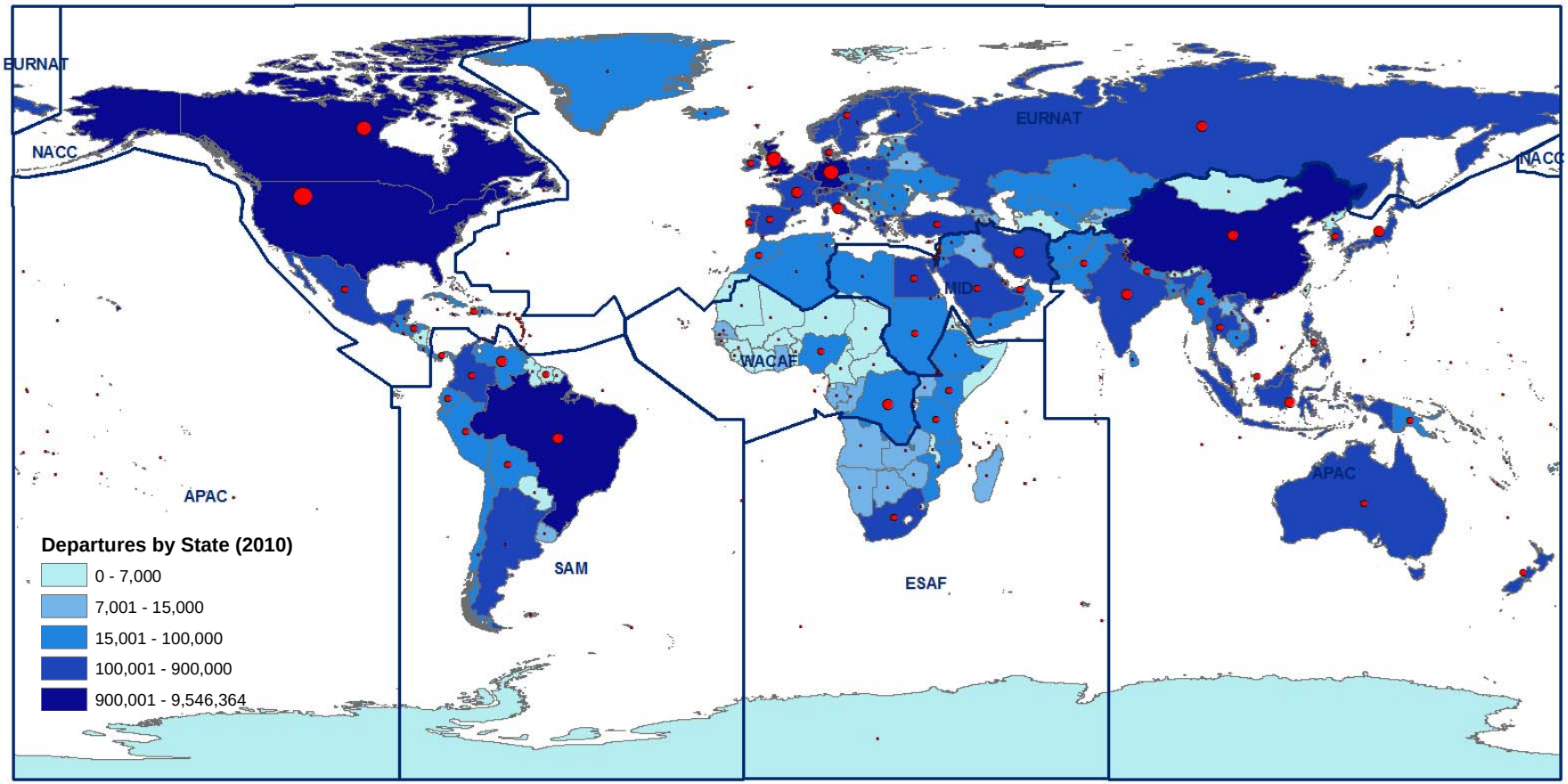
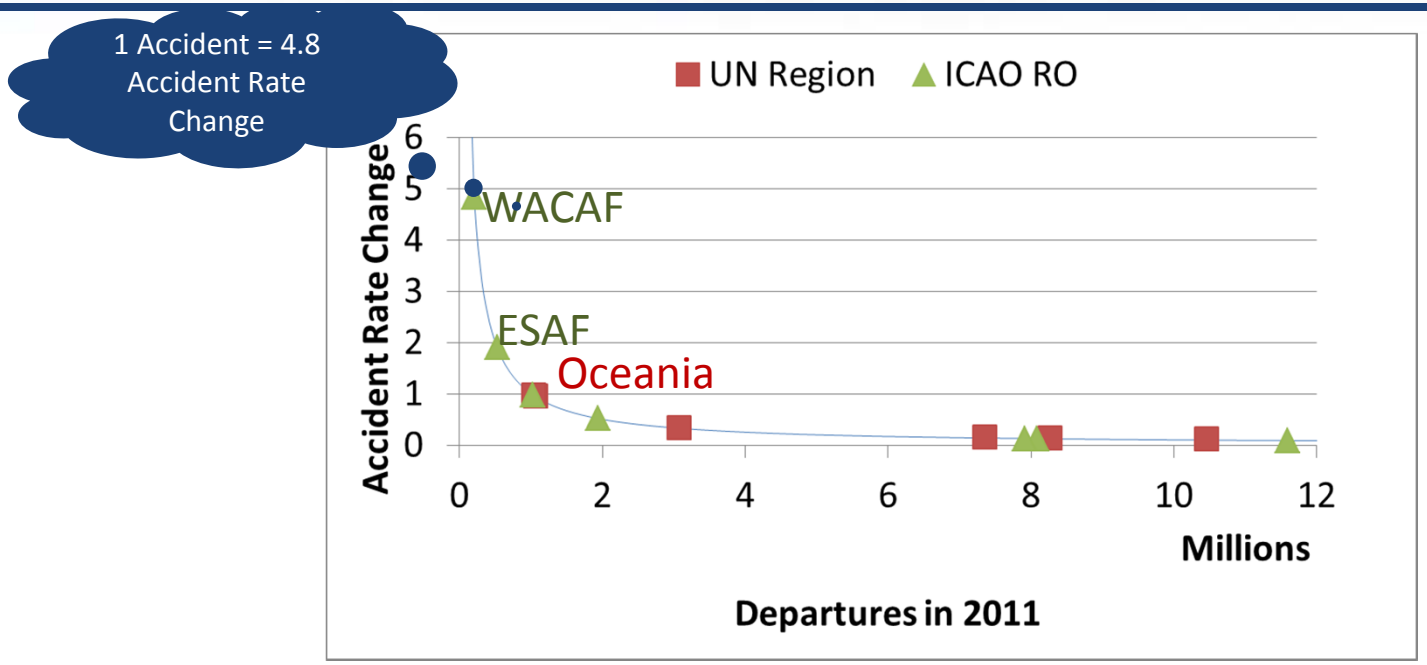


Accidents and Departures



Modifiable Areal Unit Problem



Standard Deviation of Unitary Change in Accident rate can used to measure MAUP for a given grouping

Evaluating Risk

1. Visualize the hazard (volume) by areal unit

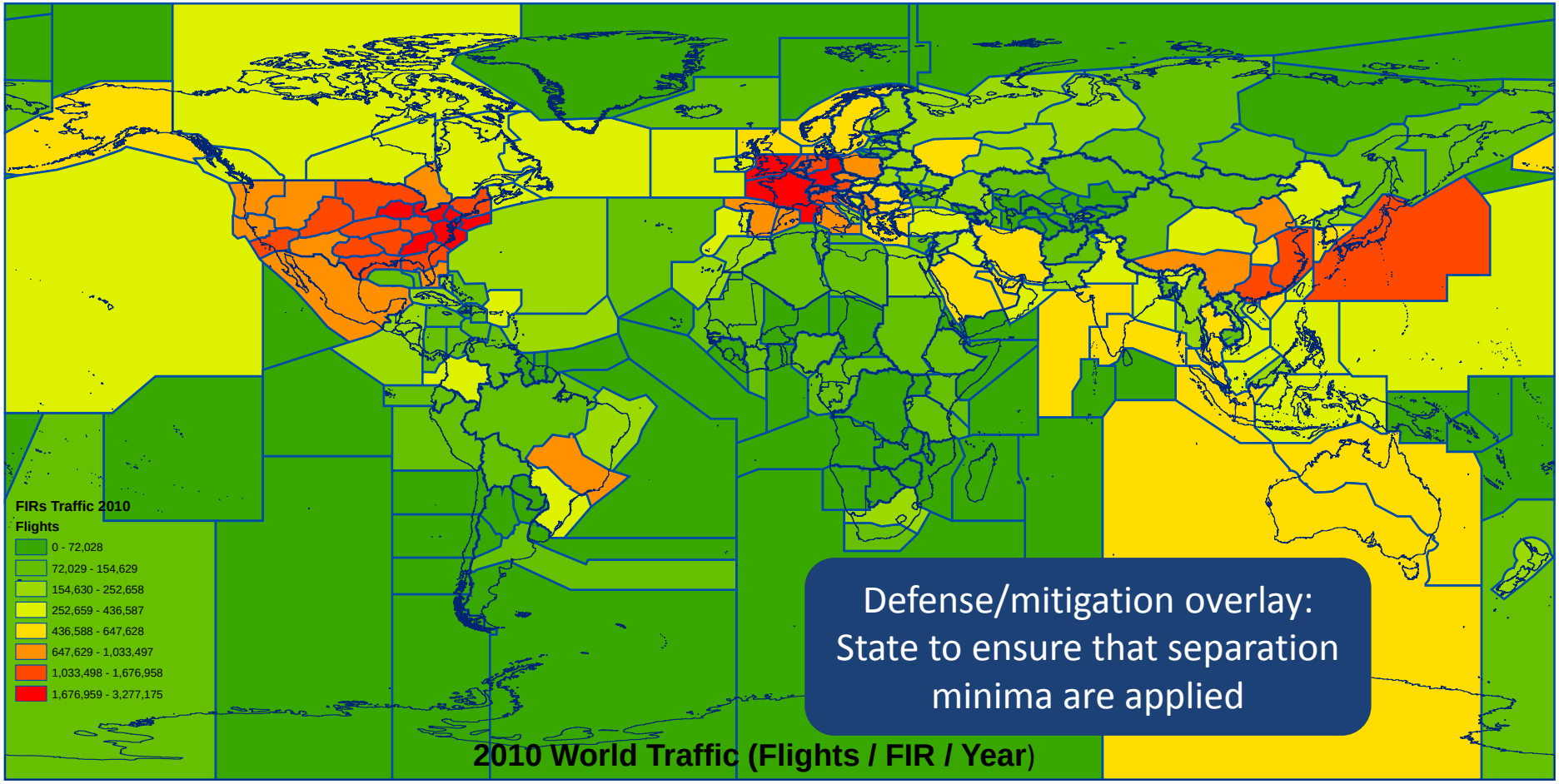
2. Overlay the corresponding defense/mitigation (level of implementation of ICAO standard, USOAP)

3. Identify areas of strong hazards with week defenses

Evaluating Risk

Loss of separation

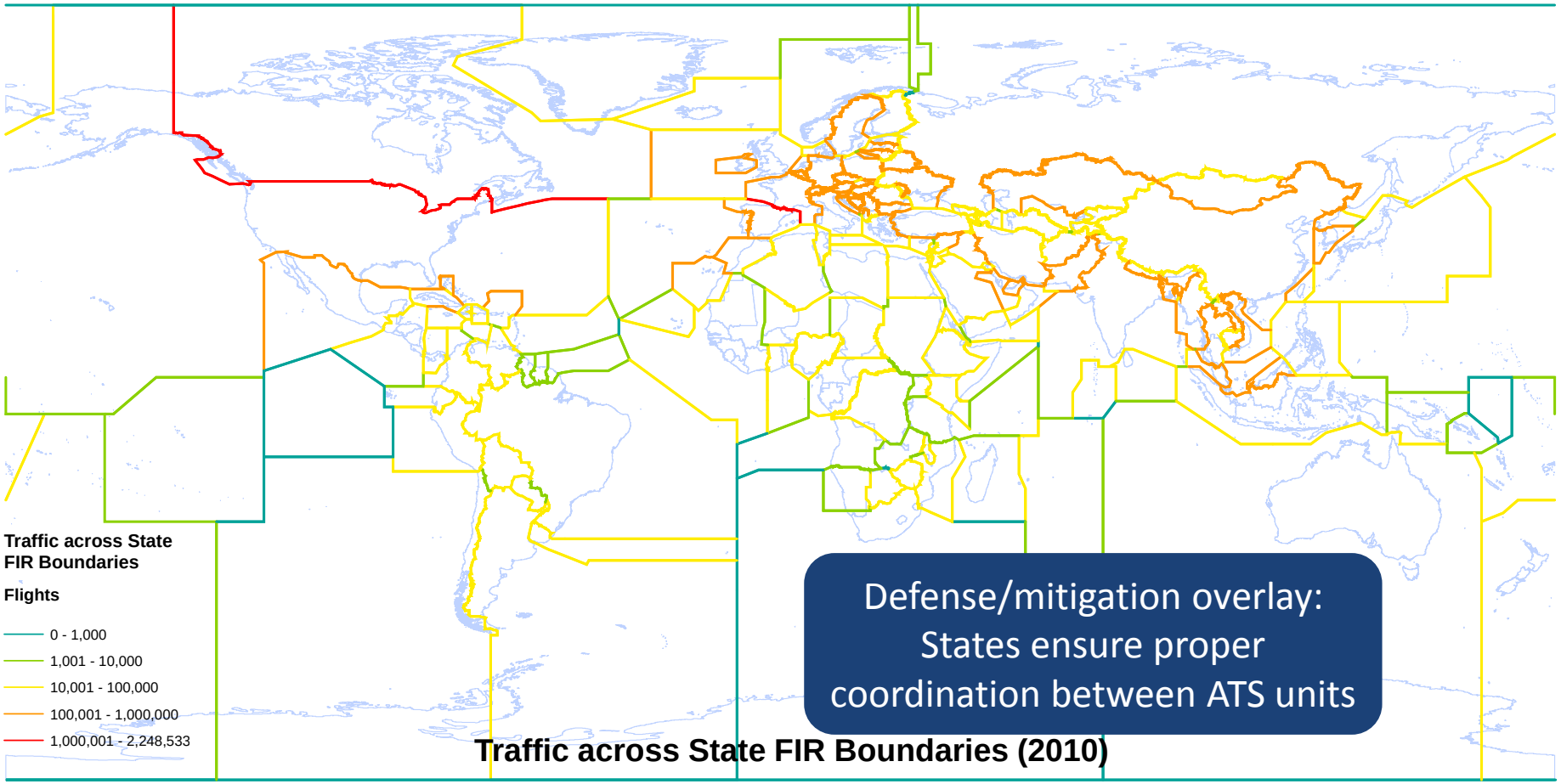
Hazard=Flights Areal Unit = Flight Information Region (FIR)



Evaluating Risk

Handover and coordination between States

Hazard=Flights Areal Unit =State Airspace Boundaries



Traffic across State FIR Boundaries (2010)

What next

- Expand iSTARS to include spatial analysis tools
- Integrate analytical terrain and weather related hazard data
- Simulate terrain

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