



# **Assurance of PNT Outside North of America**

**15<sup>th</sup>. PNTAB meeting**

**Marriott Waterfront,**

**Annapolis**

**June 12 ,2015**

**Refaat Rashad**

**AIN**



# **P**rotection

## **Enforcement of National Laws and Regulations**

- **Detection**
- **Geo-location and**
- **Detention**

# Toughness

**Enhanced signals L2C and L5.**

- **Manufacturers agreements**
- **for Smart and Interference**
- **Resistance Receivers**

# **A**ugmenting

## **Augmenting and Backup**

**1- Accuracy and Integrity through;**

**- *Nationals DGPS,***

**- *SBAS by EGNOS augment GPS in Euro-Med countries and MSAS in Japan etc.***

**2- Backup GPS by eloran.**

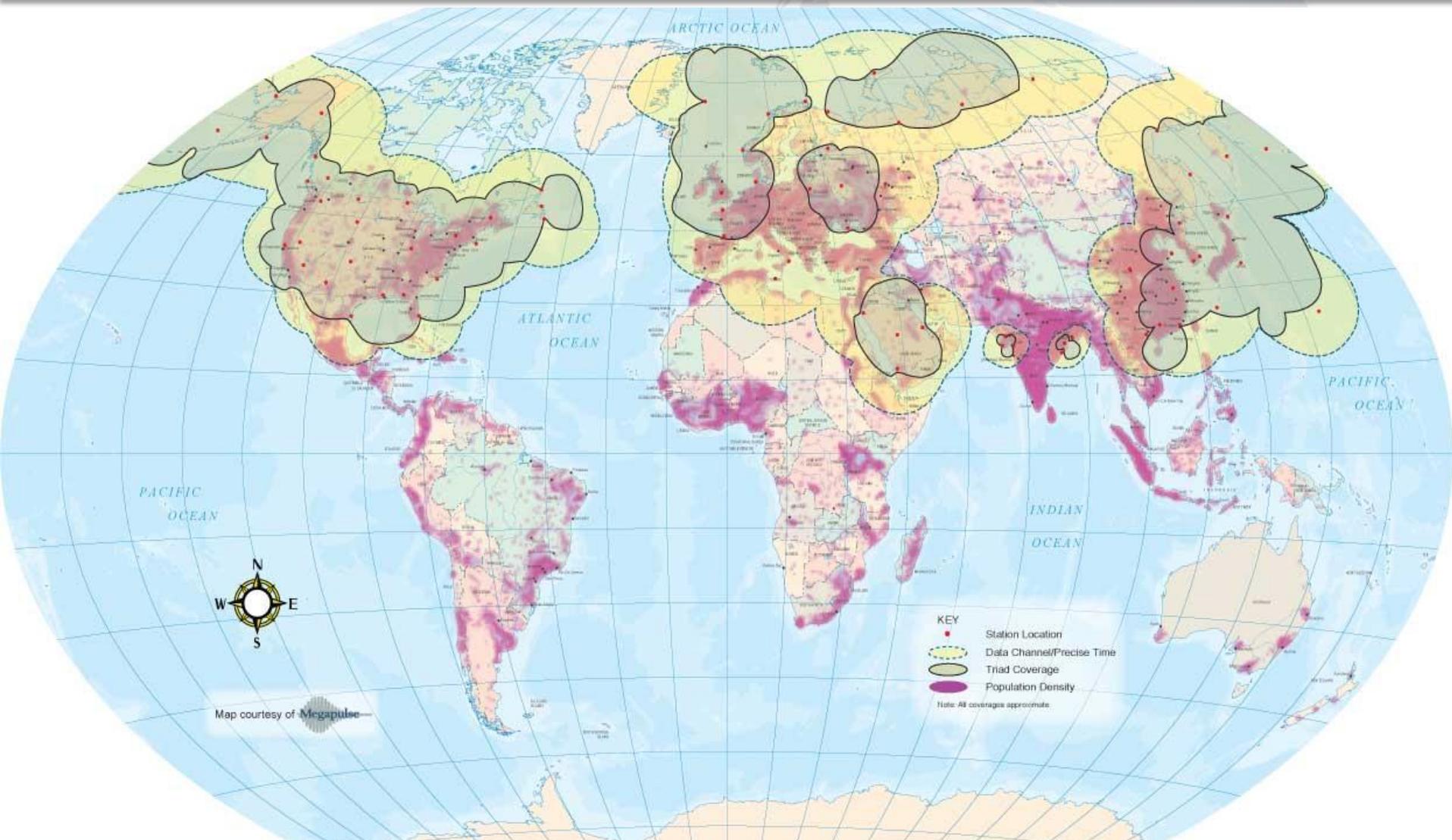


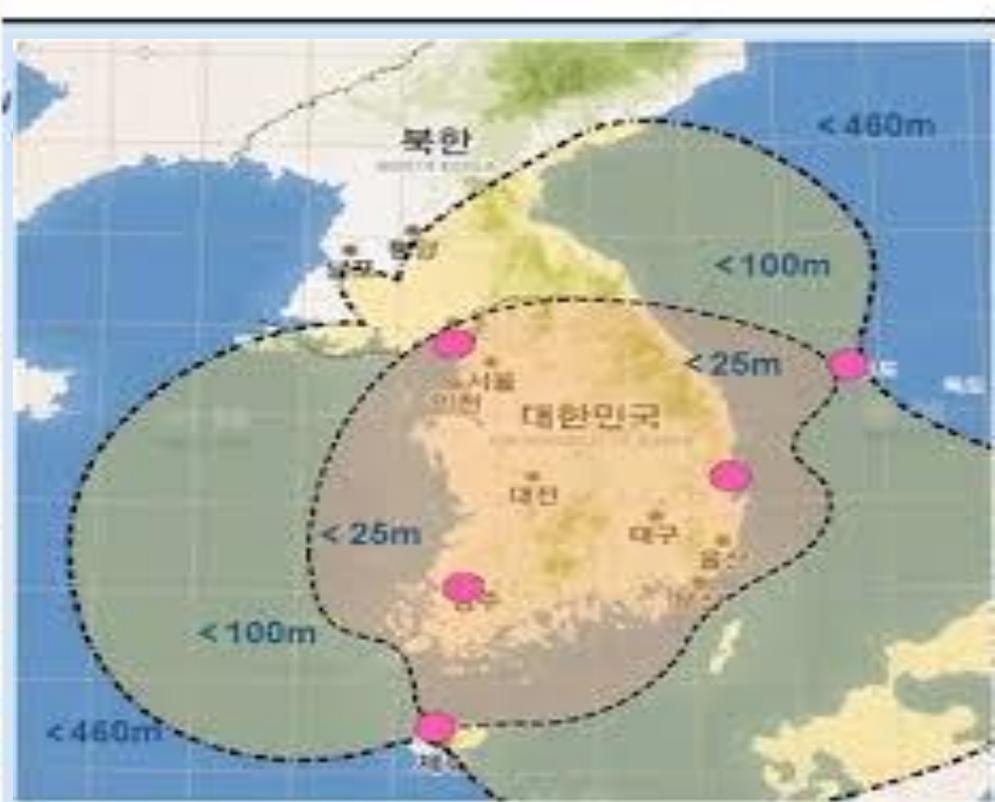
**eloran requires:**

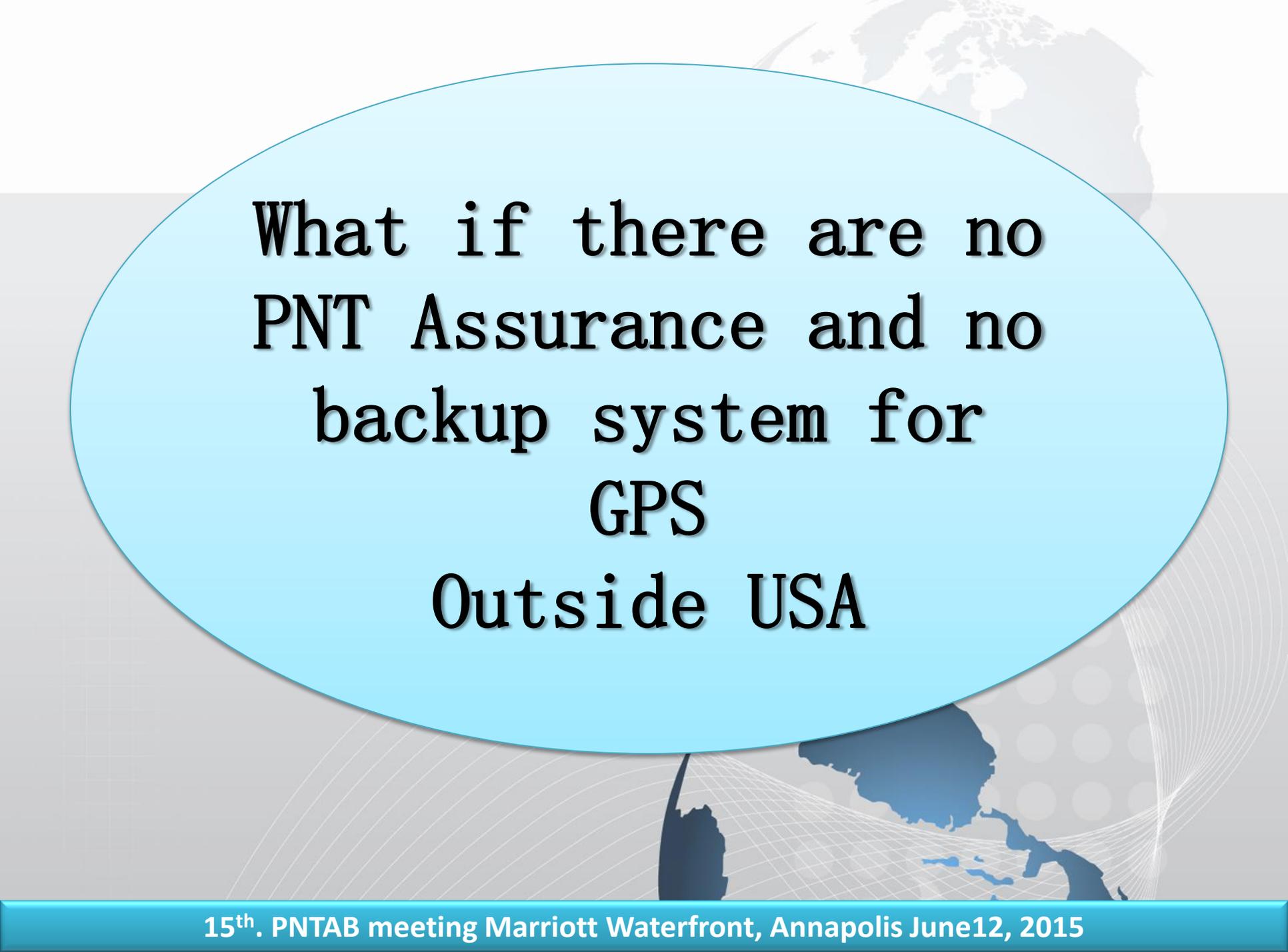
***1- Amending, Updating or modifying the existing traditional Loran-C stations***

***2- Build new e loran beacons***

# The Coverage of the Traditional LORAN-C



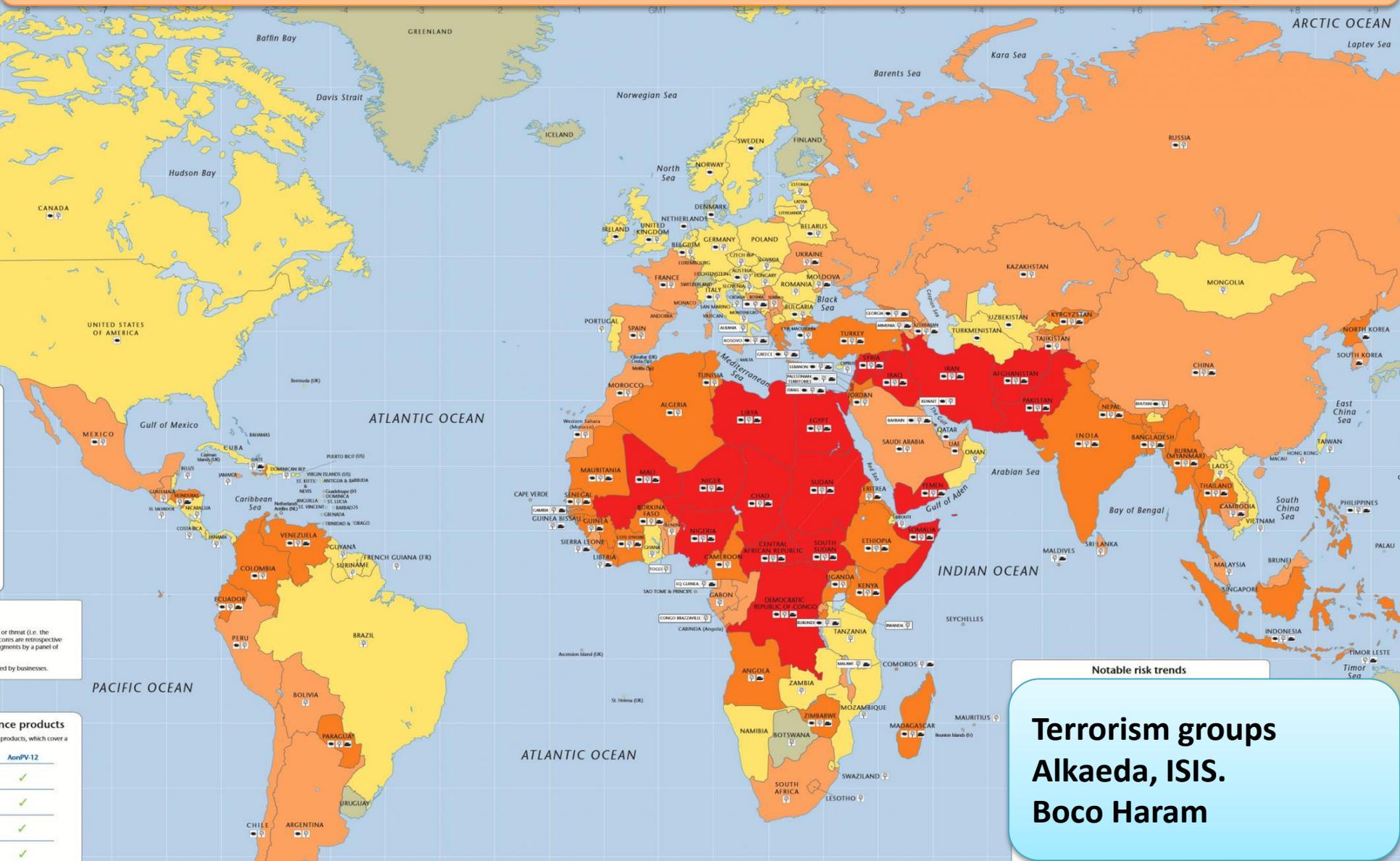




**What if there are no  
PNT Assurance and no  
backup system for  
GPS  
Outside USA**

# 2013 Terrorism & Political Violence Map

## Possible Jamming / Spoofing Attacks on GPS



of threat (i.e. the  
circles are retrospective  
gments by a panel of  
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nce products  
products, which cover a  
AonPV.12  
✓  
✓  
✓  
✓

# No solution is. Viewed but urge For more cooperation by

- Extensive Bilateral agreements,
- Comprehensive Multilateral agreements
- Enforcement of the International agreements to protect the GPS signals. Encourage countries to establish eloran coverage

# Recovery Process

- **If** detection of the interference and spoofing, Geo-locating and remove the source of interference, detain the perpetrator, are considered difficult, costly, and required sophisticated technical support in the USA.
- **It** Must be very difficult if not **impossible** in many countries without International assistant

# International Pressure is required for **PNT** **Assurance**

- **ICAO, IMO, ITU, IALA, IHO, UNOOSA, ICG, etc.**
- **Other initiative to be made through Conferences and seminars Organized by ION, IAIN, RIN, AIN, and the Resilience foundation**
- **State initiatives for technical support from USA, EU, Japan and others countries are essential**

**It is not enough  
to Assure PNT in US  
Boundaries  
We should contact  
Partners, Friends for  
action for protection and  
backup**



***GOD Bless You***



*Thank You!*

