



Critical contribution by “Geo” and “PNT” for decision making

NATO OR&A Conference

18 October 2021

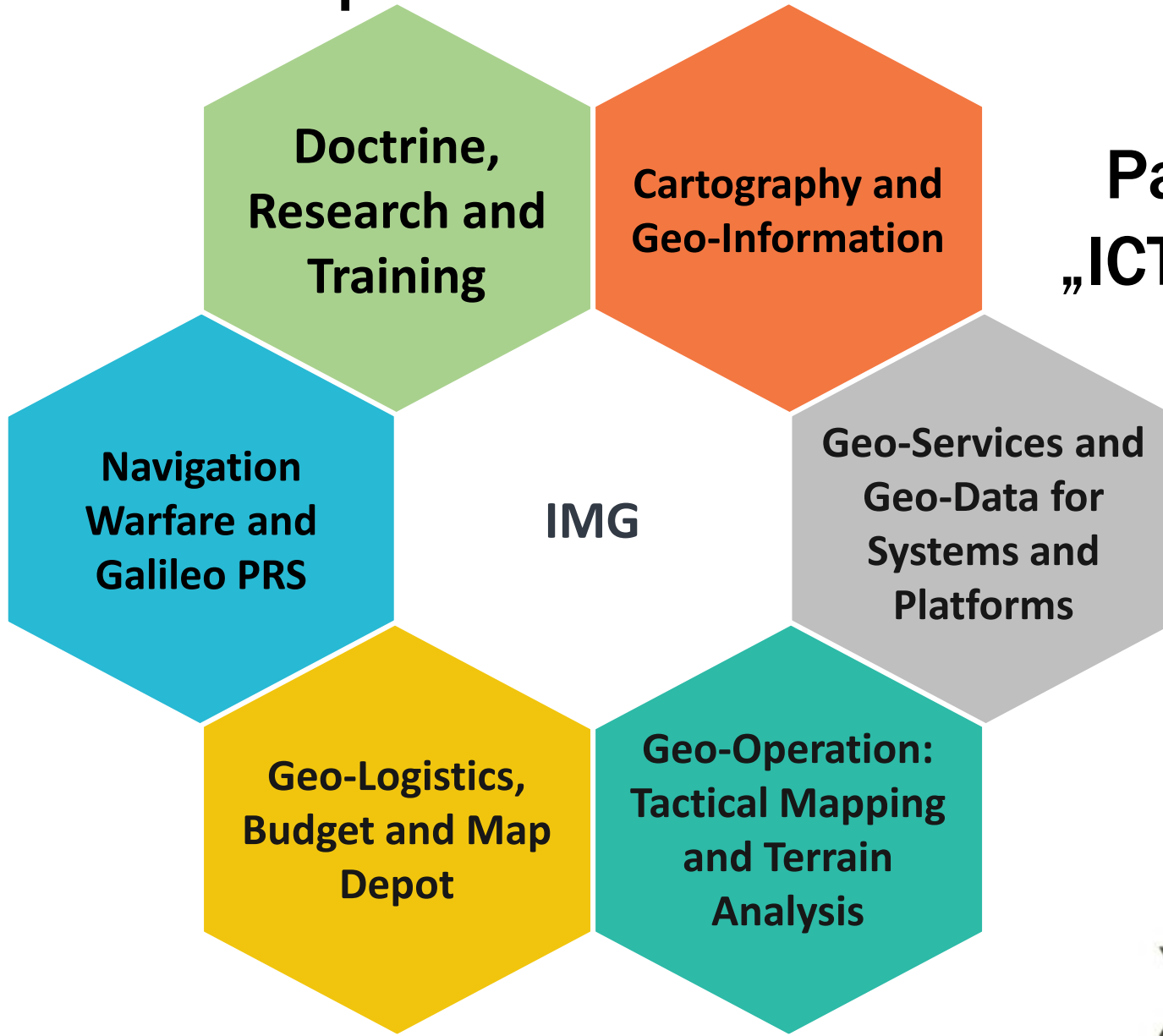
Brig-Gen Friedrich TEICHMANN



UNSER HEER



Geospatial Institute MoD AUT = IMG



Part of DG
„ICT & Cyber“





Where did it happen?

The screenshot shows a Google search for "terrorist attack". The search bar is at the top, and the results are displayed in a grid. Each result includes a thumbnail image and a short text snippet with a source link.

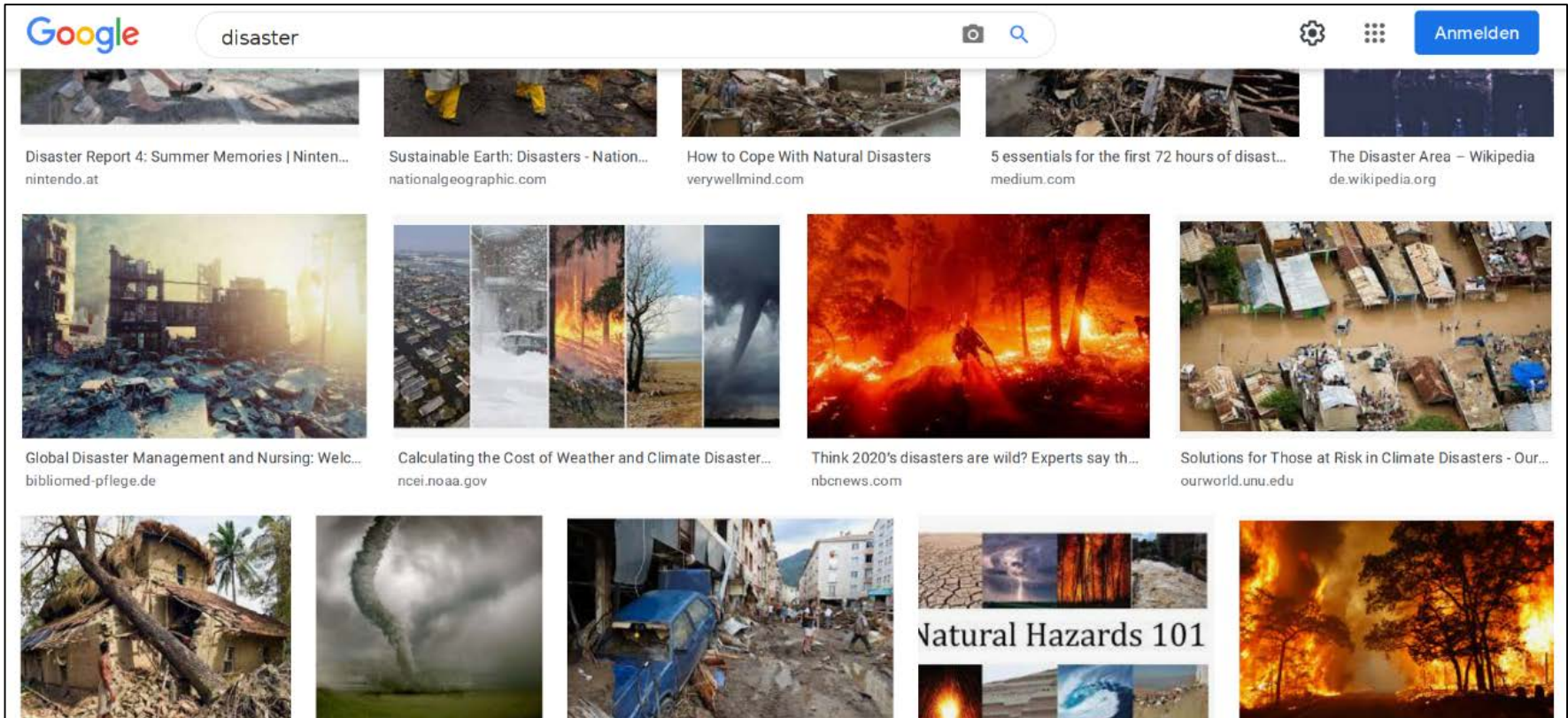
- Result 1:** Image of police officers at night. Text: "Vienna terror attack: At least four people killed and ... news.sky.com"
- Result 2:** Image of a street scene with emergency vehicles. Text: "Austria was warned before terror attack in Vienna aa.com.tr"
- Result 3:** Image of a police officer in riot gear. Text: "Islamic State group claims responsibility for Vie... france24.com"
- Result 4:** Image of police officers in riot gear. Text: "Terror attack in Vienna reflects Europe's deep-root... globaltimes.cn"
- Result 5:** Image of police officers walking. Text: "Vienna terror attack: Police investigating 21 potential... dw.com"
- Result 6:** Image of police officers at night. Text: "At least 4 dead, 15 wounded in 'apparent terrorist att... abcnews.go.com"
- Result 7:** Image of a building on fire. Text: "Terrorism - Wikipedia en.wikipedia.org"
- Result 8:** Image of a street scene with people. Text: "At least 40 killed, dozens injured in terror attack in N... trtworld.com"

“Location” is the fundamental knowledge for Decision Making





Why there?



“Geo” is the fundamental knowledge for Decision Making





Why “Geo” and why “secure PNT”

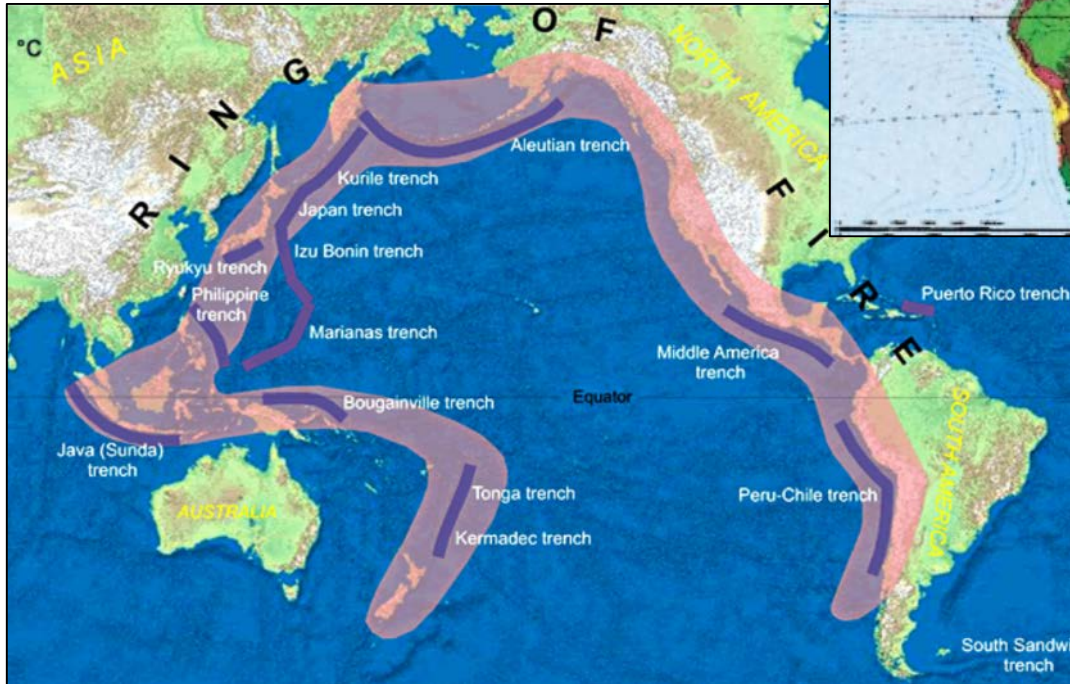
- ▶ **Where am I (localization)?**
- ▶ **Where do I need to go (target)?**
- ▶ **How do I get there (navigation)?**
- ▶ **How does it look there?**

- climate
- streets/LOC
- vegetation
- dangers
- terrain
- etc.





Examples for critical Geo-factors 1



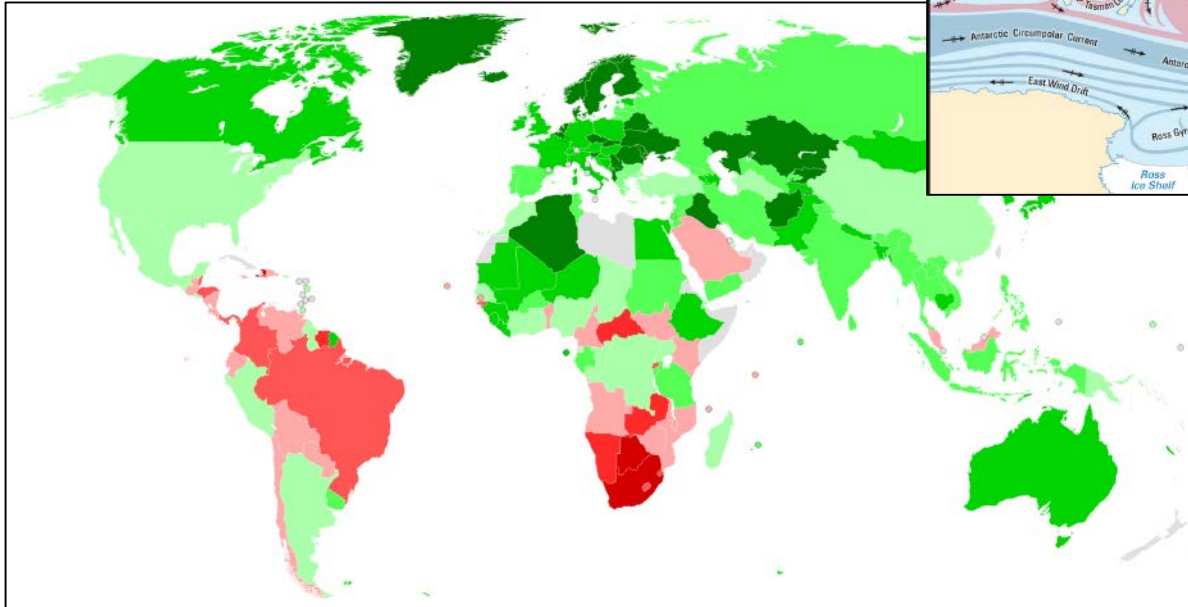
Ring of fire = volcanos

Vegetation

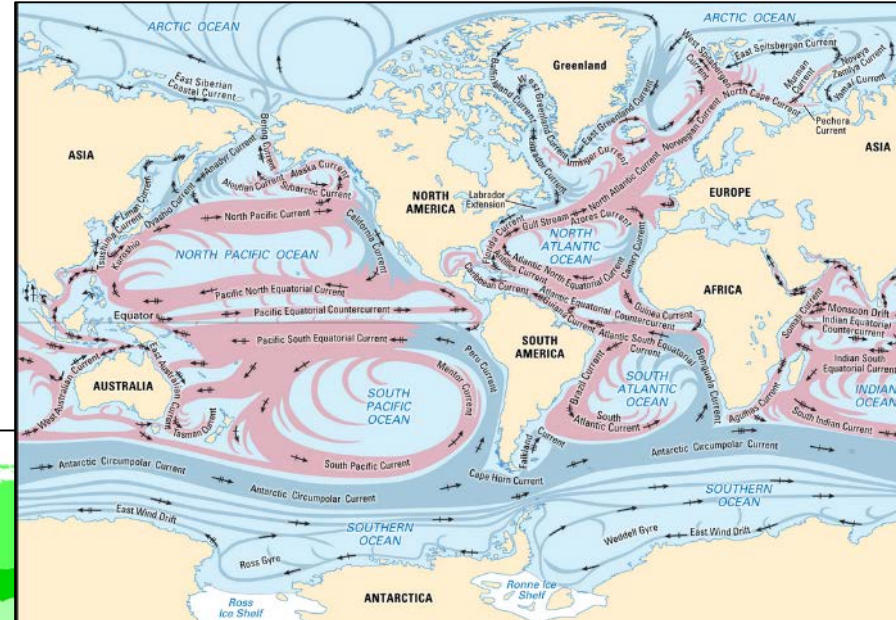




Examples for critical Geo-factors 2



Gini coefficient

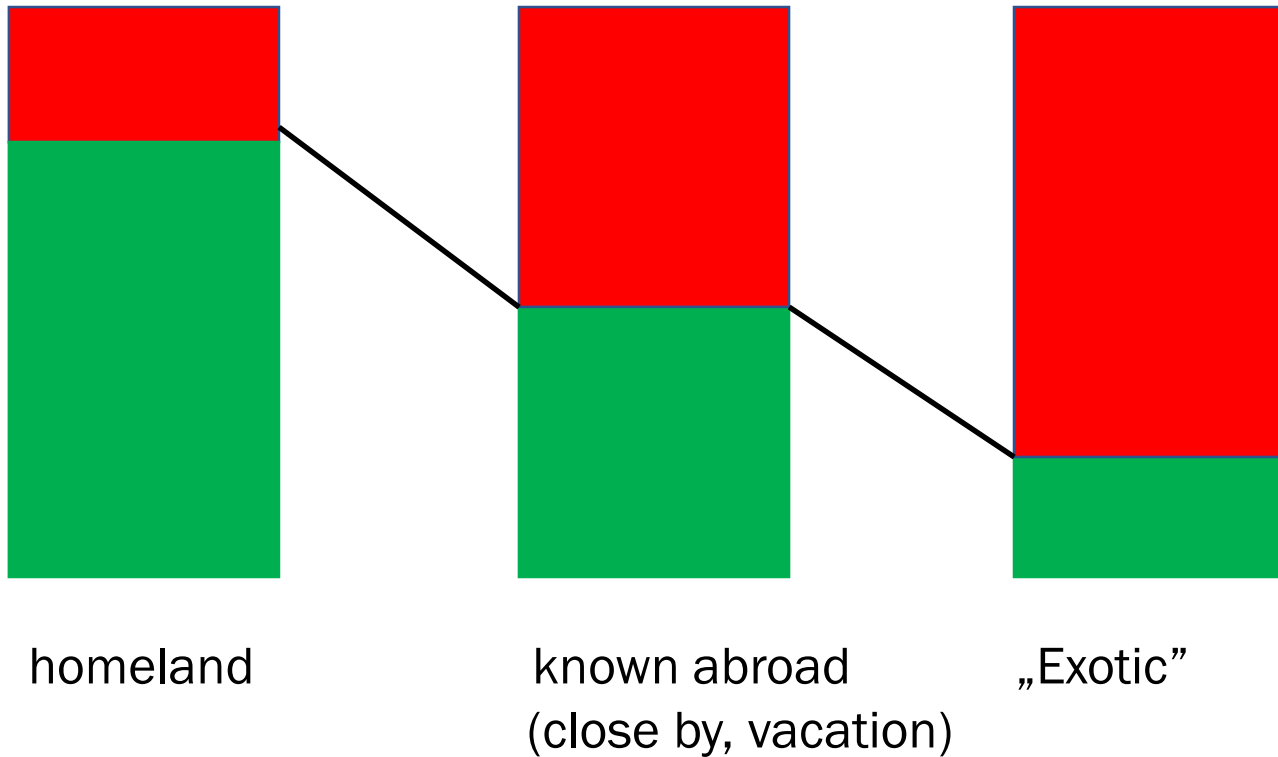


Ocean currents





Why Geo – I know already everything!



= Information
requirement

= secure
knowledge





Added Value of “Geo-knowledge” for operations

- ▶ **Right equipment and outfit**
- ▶ **Proper maintenance**
- ▶ **Precise training**
- ▶ **Successful doctrine and procedures**
- ▶ **No surprise**
- ▶ **Faster reaction**
- ▶ **Better decision making**
- ▶ **...**

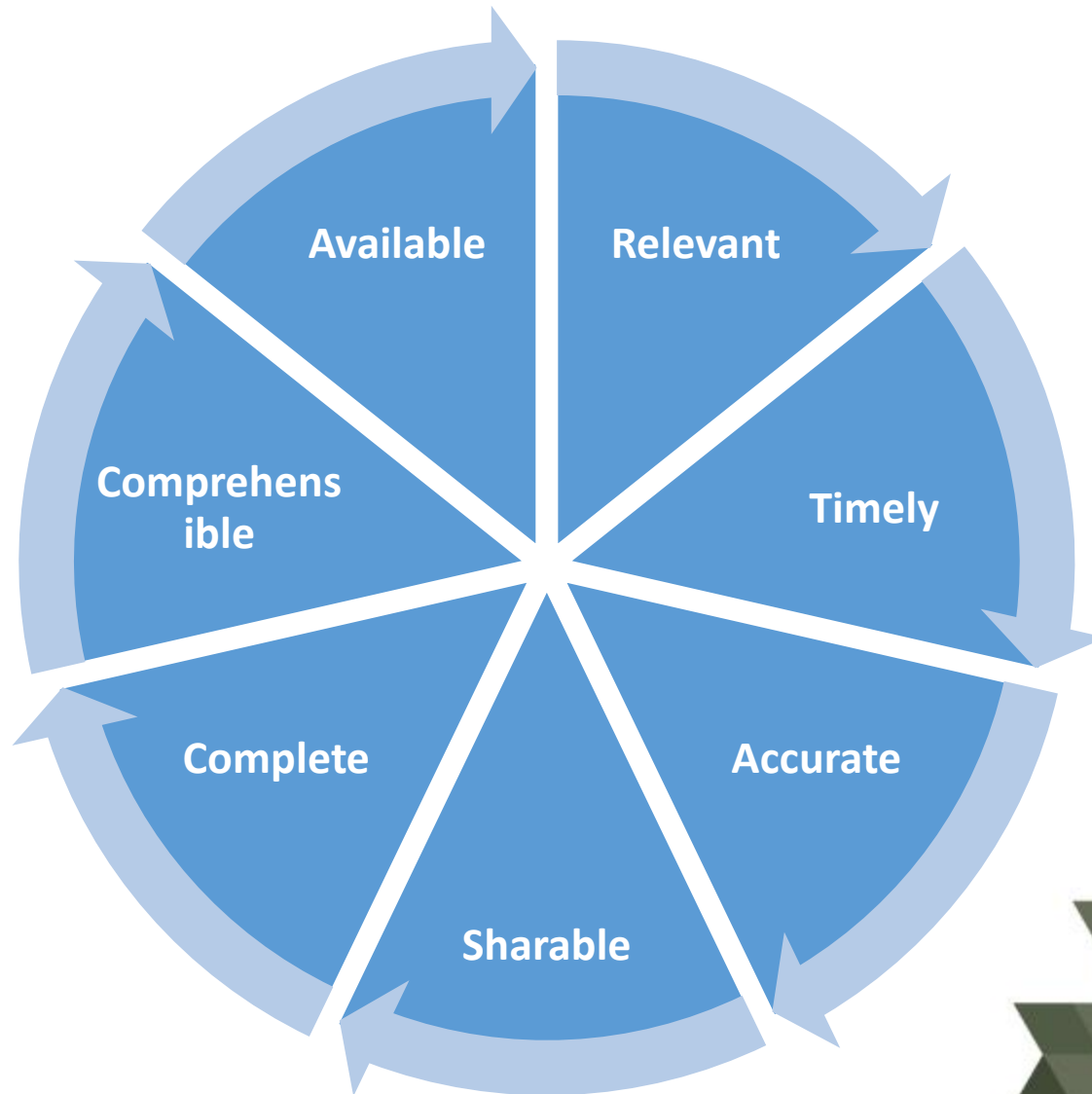
Enabler for Information Superiority

Remark: all this is very cheap





The “Geo” Challenge



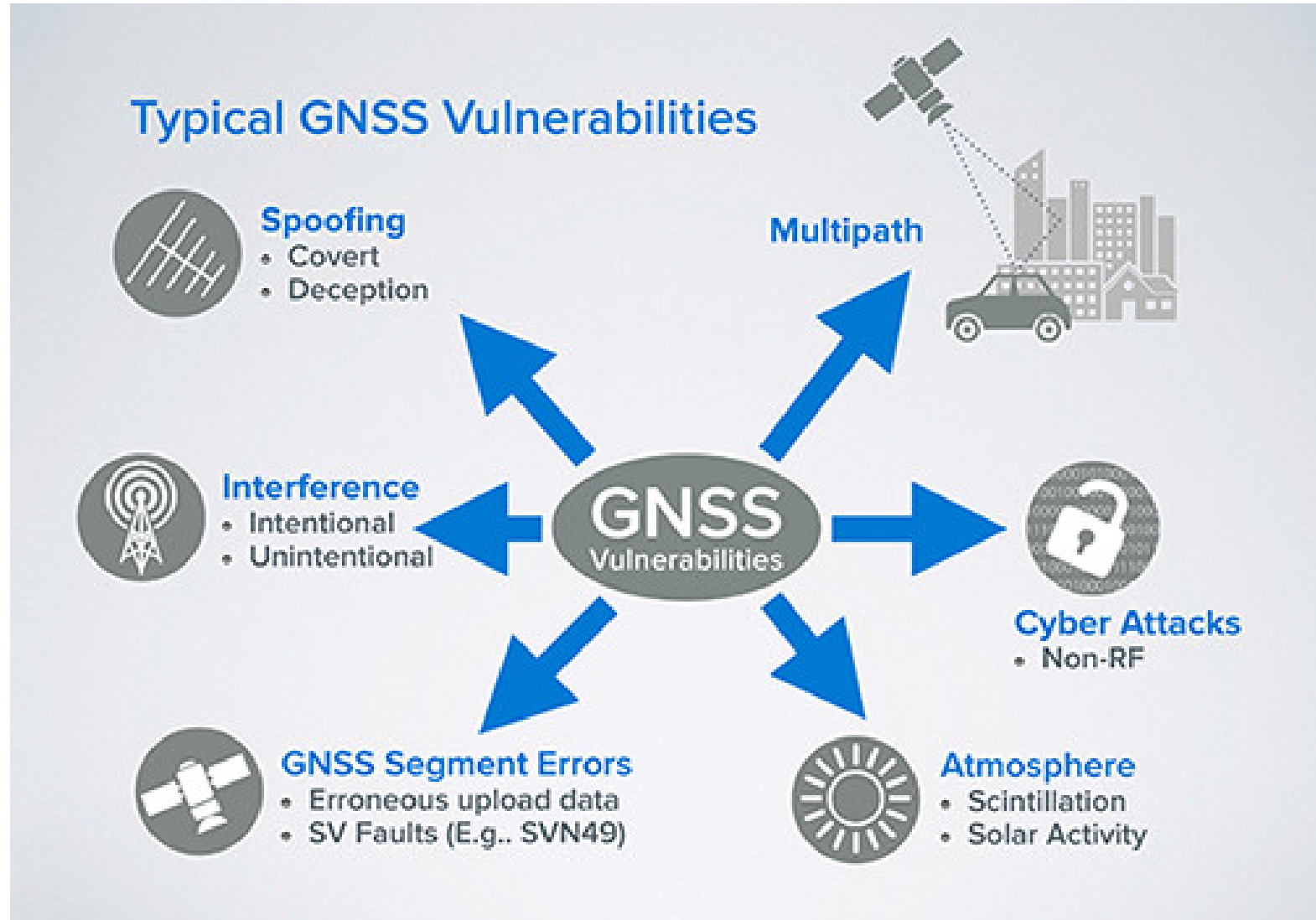


The “Location – Navigation” Challenge



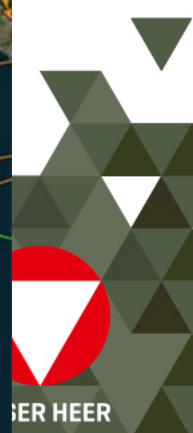
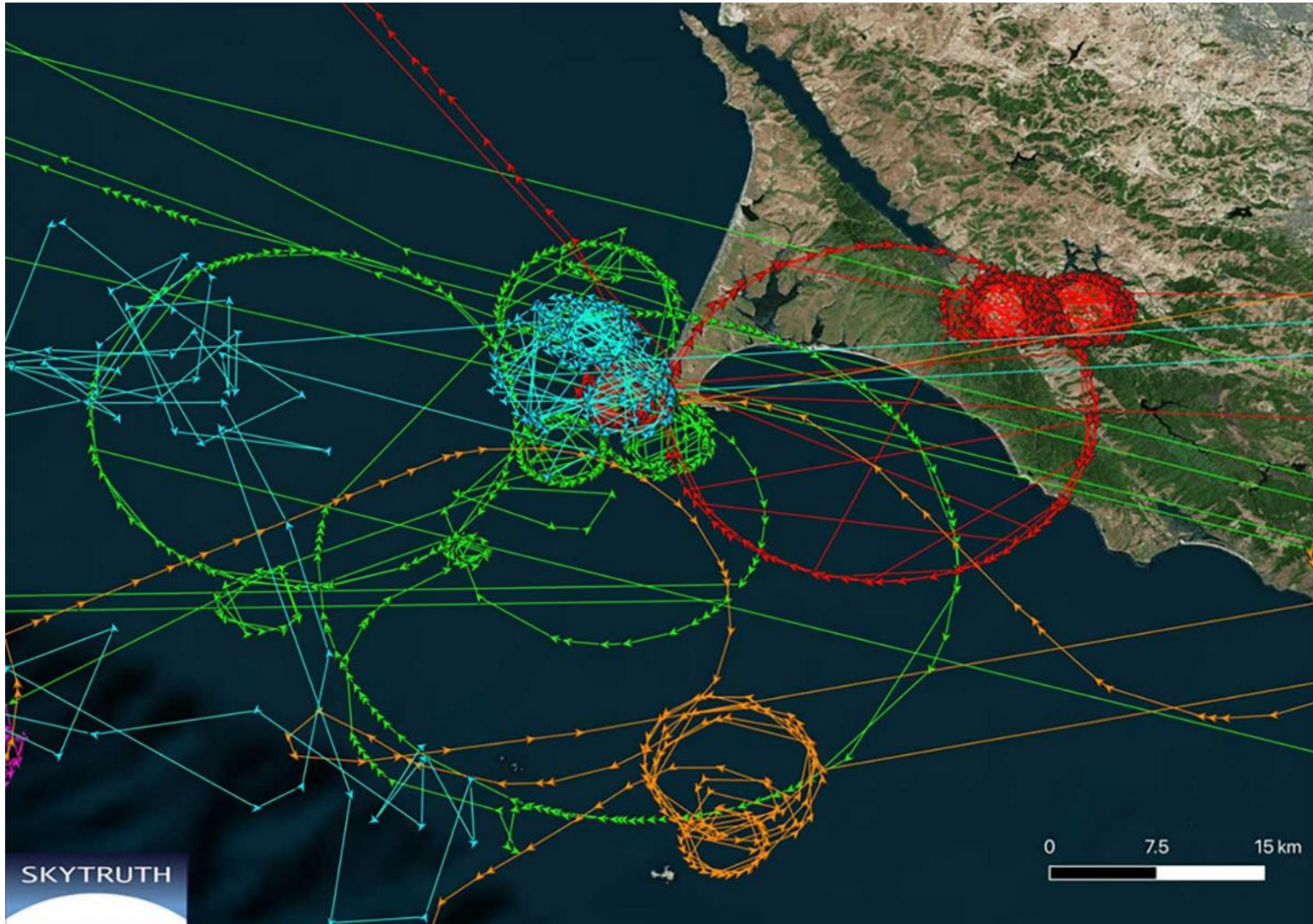


Vulnerabilities of Global Navigation Satellite Systems





Ship Track observations by Skytruth





Executive Order - President of the United States

Executive Order on Strengthening National Resilience through Responsible Use of Positioning, Navigation, and Timing Services INFRASTRUCTURE & TECHNOLOGY

Issued on: February 12, 2020

By the authority vested in me as President by the Constitution and the laws of the United States of America, it is hereby ordered as follows:

Section 1. Purpose. The national and economic security of the United States depends on the reliable and efficient functioning of critical infrastructure. Since the United States made the Global Positioning System available worldwide, positioning, navigation, and



Added Value of “secure PNT” for operations

- ▶ **Command&Control (Correct FFT – Blue Force Tracking)**
- ▶ **Protection of platforms and systems**
- ▶ **Synchronized timing**
- ▶ **Correct routing**
- ▶ **Optimal navigation**
- ▶ **Standardization and Interoperability**
- ▶ **...**

Enabler for Information Superiority

Remark: Jamming and Spoofing of GNSS is a very powerful and underrated tool

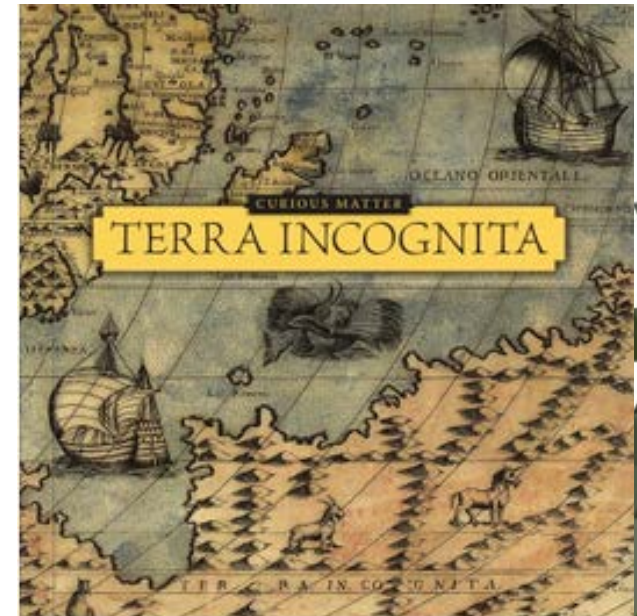




Summary

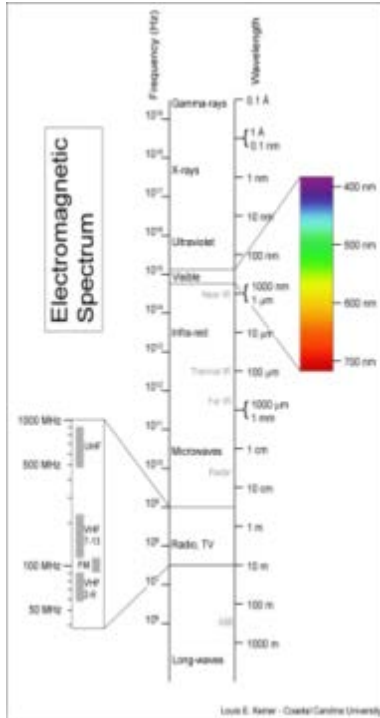
“Information Superiority” and proper “Decision Making” is enabled by:

- 1. REP (Recognized Environmental Picture) and optimal understanding of the mission environment through “Geo”**
- 2. Precise Situational Awareness by secure PNT (Position Navigation Timing)**



What if no GPS/GNSS/SatNav?

What if mission area is “Terra Incognita”?



Questions?

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