

Observing the Ocean and Earth with



Observing the oceans and Earth with submarine cables: the Caribe



Bruce Howe
and
Matthew Fouch

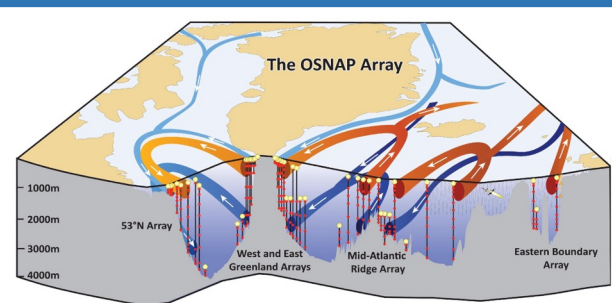
JTF SMART Cables

XVIII ICG/Caribe-EWS
Online
5 May 2025

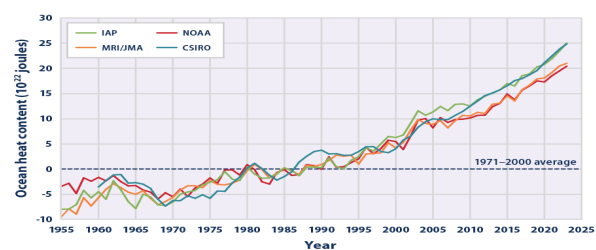
Scientific Monitoring And Reliable Telecommunications

United Nations initiative to bring together science with the telecom industry for
Global Observation of the Oceans and Earth

Ocean general circulation – all scales



Ocean heat and circulation

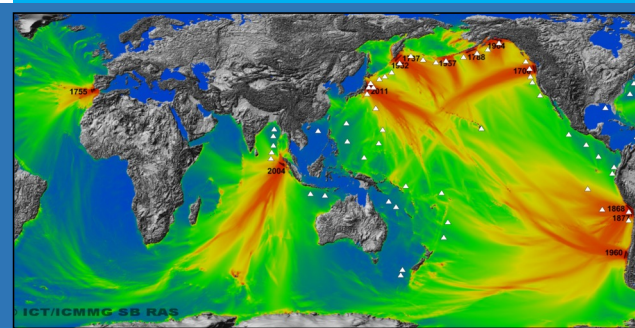


Climate
Change

Early
Warning

Sea
Level
Rise

Earthquakes and Tsunamis



Disaster Mitigation





- JTF Secretariat
- Resolutions on climate change Disaster Risk Reduction (DDR) includes SMART
- Recommendations SG15/Q8 G.dsssc/9730.1 and G.SMART/9730.2
- Integrates SMART into WMO Information platform
- Global Ocean Observing System (GOOS)
- Tsunami Programme
- UN Ocean Decade: endorsed Project
- Emerging Observing Network of GOOS



Recommendation ITU-T G.9730.2 (08/2024)

SERIES G: Transmission systems and media, digital systems and networks

Access networks – Metallic access networks

Scientific monitoring and reliable telecommunications submarine cable systems

Manual on the WMO Information System

Volume II – WMO Information System 2.0

Annex VII to the WMO Technical Regulations



Global Array for Climate, Oceans, Sea Level, Earthquakes, Tsunamis

1st order addition
to Ocean-Earth
observing system

A sustained planetary sensor, power, Internet network

Share submarine
cable infrastructure
Telecom + science
↓ €\$

NO Interference

1.4+ GM
~20,000 repeaters
20 year refresh

Every ~100 km


Emerging
Network

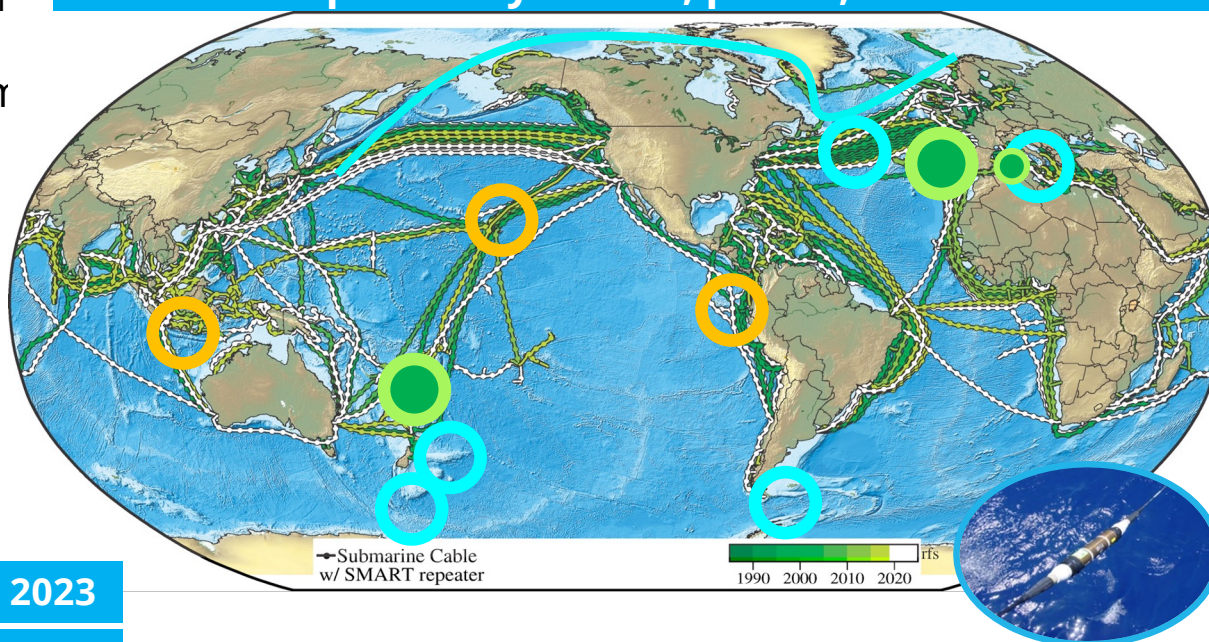

2021 United Nations Decade
2030 of Ocean Science
for Sustainable Development

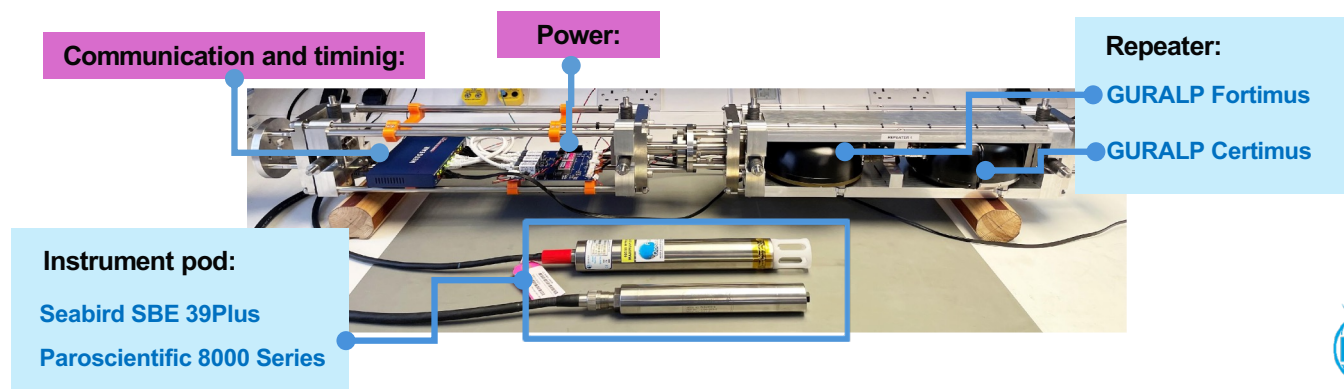
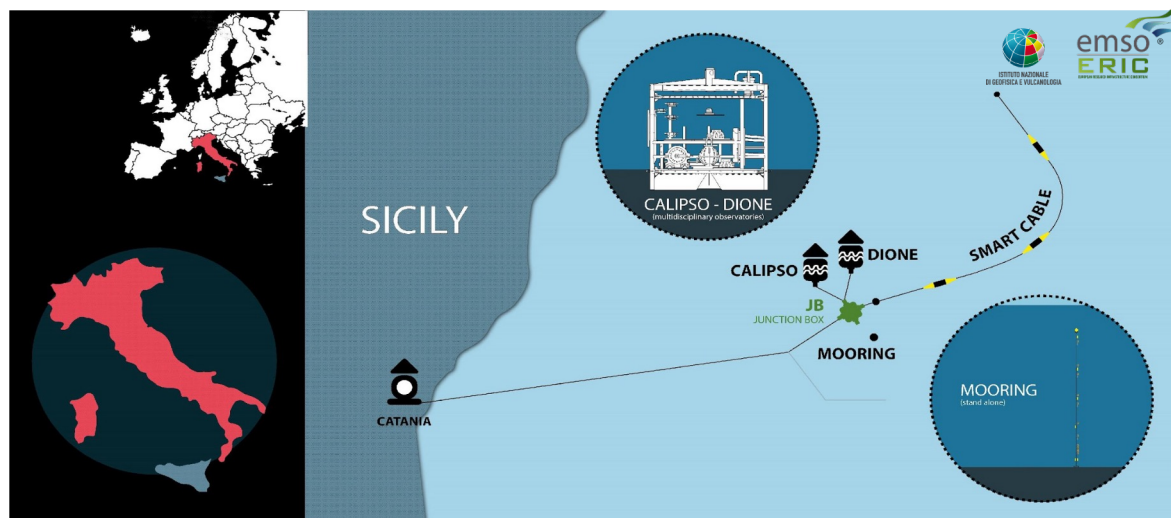
InSEA Wet Demo 2023

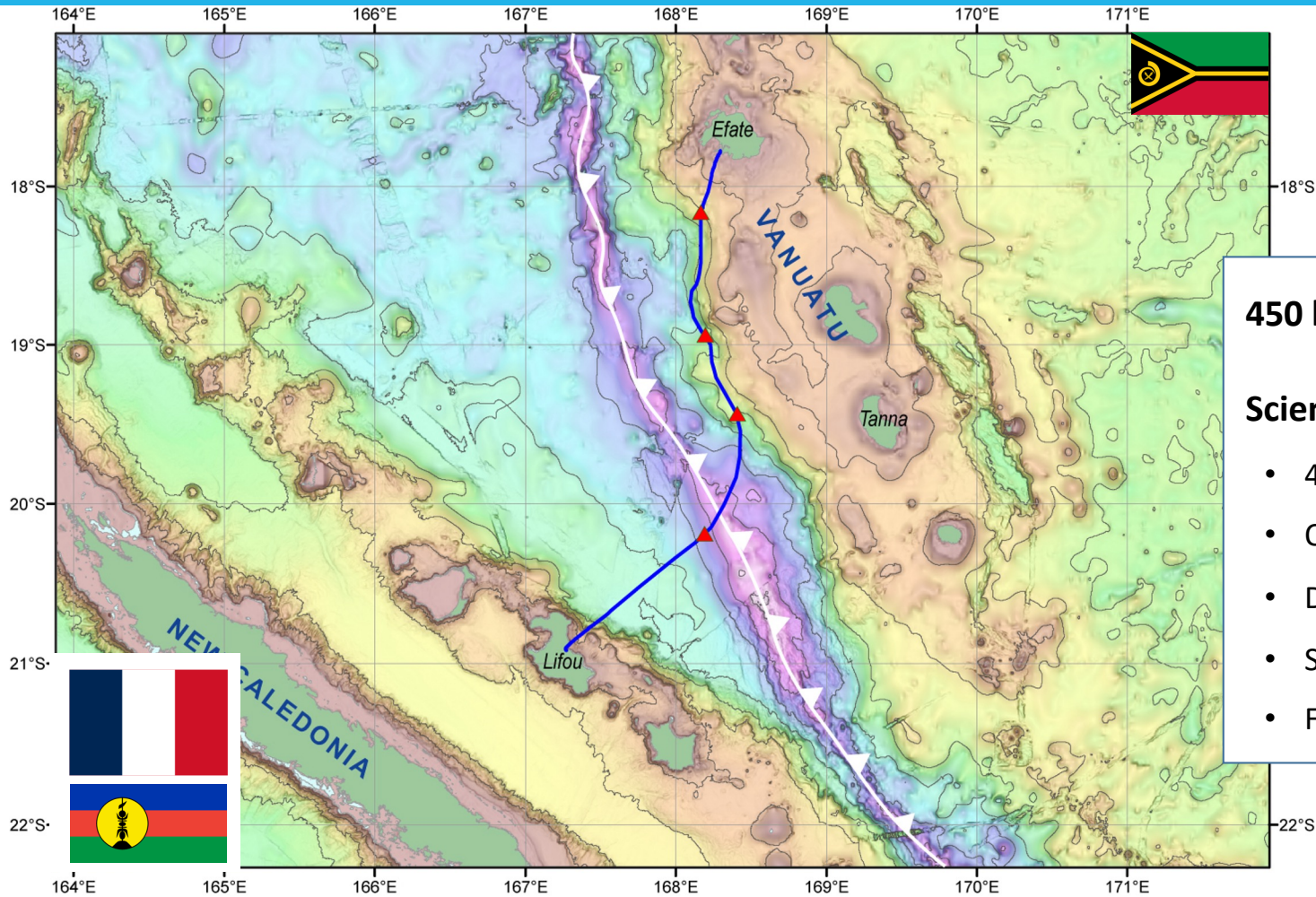
**SMART Atlantic CAM
and Tamtam V-NC
Funded, install 2026**

**Know the environment
protect the network**

Bottom temperature, pressure,
seismic motion



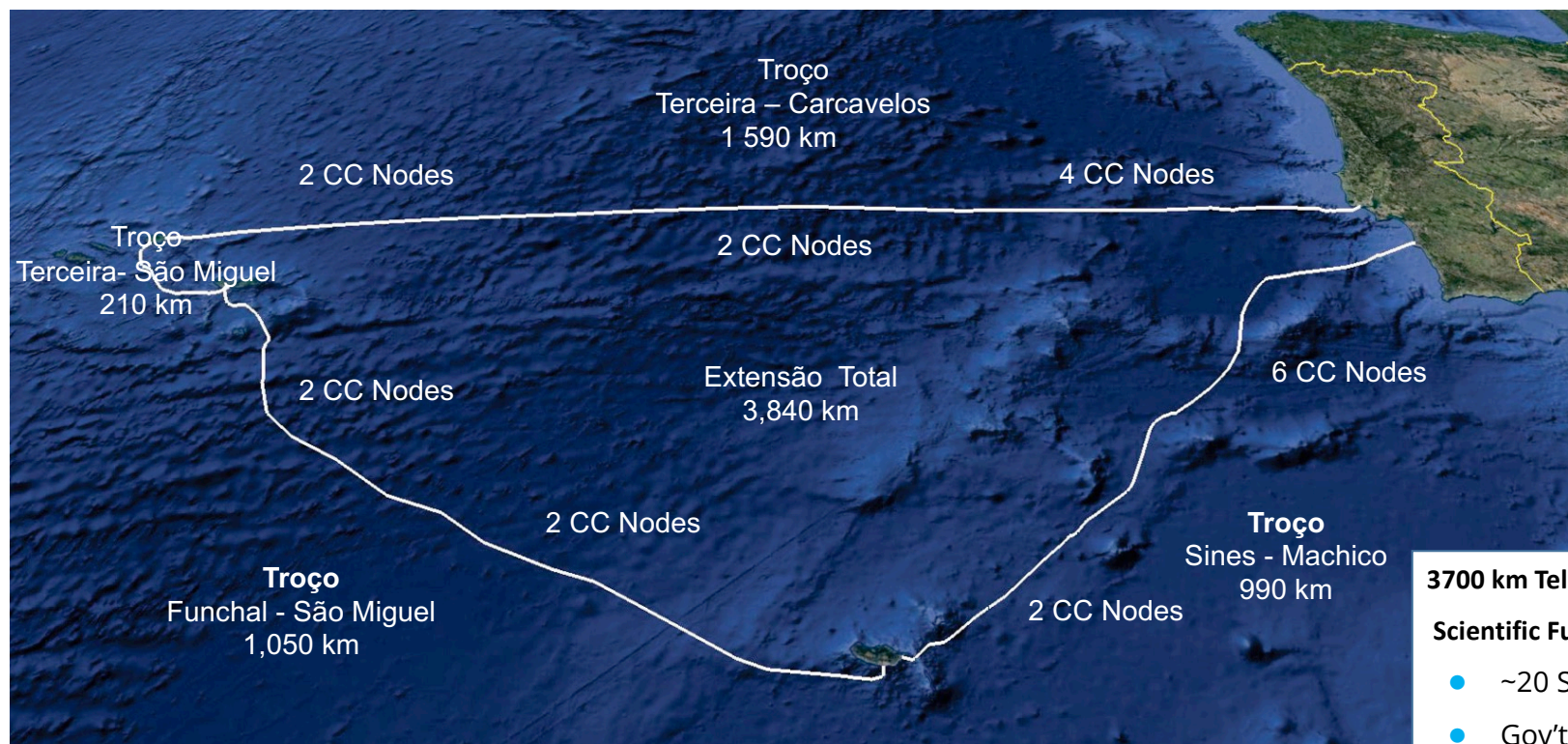




450 km Telecom Cable

Scientific Funding :

- 4 SMART « CC-nodes »
- Other sensing techniques
- Data Center
- Scientific Research
- France + ADB



3700 km Telecom Cable

Scientific Funding :

- ~20 SMART modules
- Gov't €154M. EU support €56M
- Other sensing techniques

CC Node: Integration of Specific Sensors in Submarine Cables

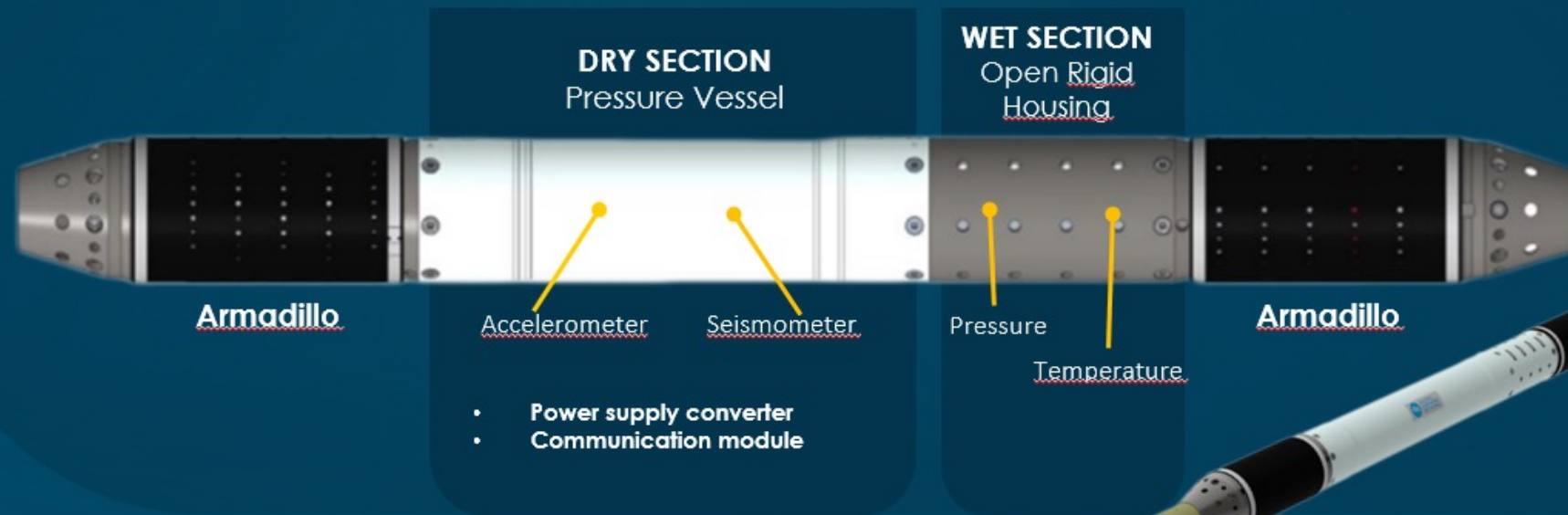
Alcatel Submarine Networks
ASN

ASN Telecom Repeater



Leveraging Proven Subsea
Telecom Technology for
SMART Integration

ASN CC Node



Transforming the SMART Cable Industry

We deliver bespoke solutions that bridge the scientific, engineering, and industry domains to democratize access to high-performance, low-power systems at breakthrough prices.

Sensor Systems: Compact & Powerful Design

- ✓ **Ultra-Efficient:** Just over 5W total system power — minimum energy, maximum performance.
- ✓ **Universal:** Available for repeater integration and as standalone in-line systems.
- ✓ **Research-Grade:** NASA-approved seismic sensors exceed specifications for challenging deployment environments while delivering scientific-grade data.
- ✓ **Adaptable:** Modular architecture and small form factor for additional sensors and diverse applications.



**Primary System +
Seismic Sensors**

SMART Cable Solutions



SMART Cable Sensor Systems

- **Trusted Provider:** 20+ years of innovative subsea technology expertise
- **Robust Systems:** Durable, state-of-the-art equipment meeting all requirements
- **Flexible Development:** Industry-leading approach to deploy tailored solutions



SMART Cable Data Management

- **Unmatched Expertise:** World-class data management specialists
- **Comprehensive Management:** End-to-end data ecosystem solutions
- **Flexible Configuration:** Adaptable to unique and evolving requirements



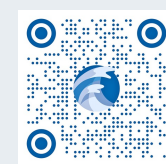
SMART Cable Data Products

- **Enhance Security:** AI-powered monitoring to detect real-time threats
- **Maximize ROI:** Unlock hidden revenue and efficiency from all SMART systems
- **Seamless Integration:** Connect easily with any data workflow

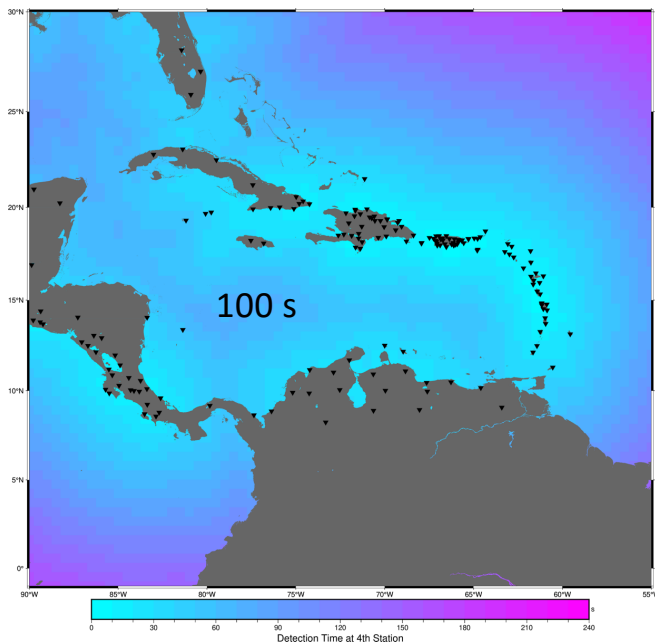
Thank You

Matt Fouch, Ph.D.
President and Co-Founder
Matt.Fouch@subseadatasystems.com

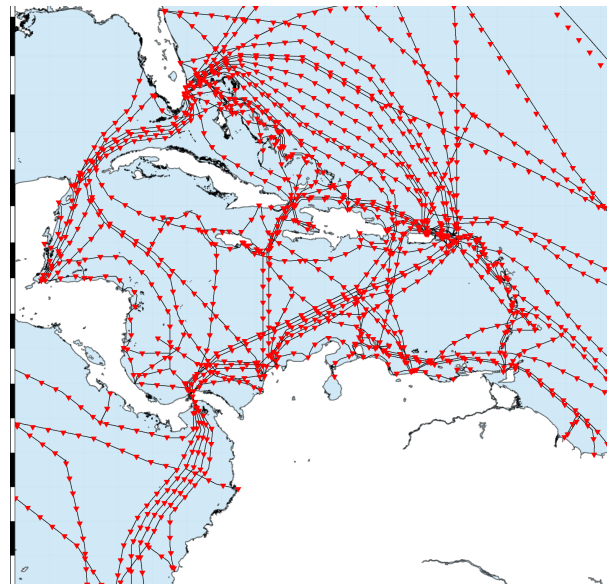
Subsea Data Systems Inc.
Trusted Partners in SMART Cable Solutions



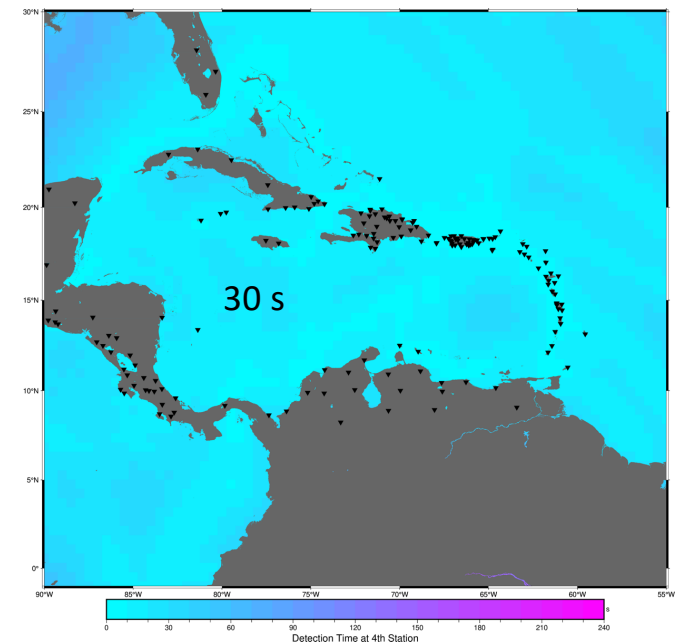
Detection times
Existing, NO SMART



Optimistic
all existing cables SMART



Detection times
EXISTING + SMART



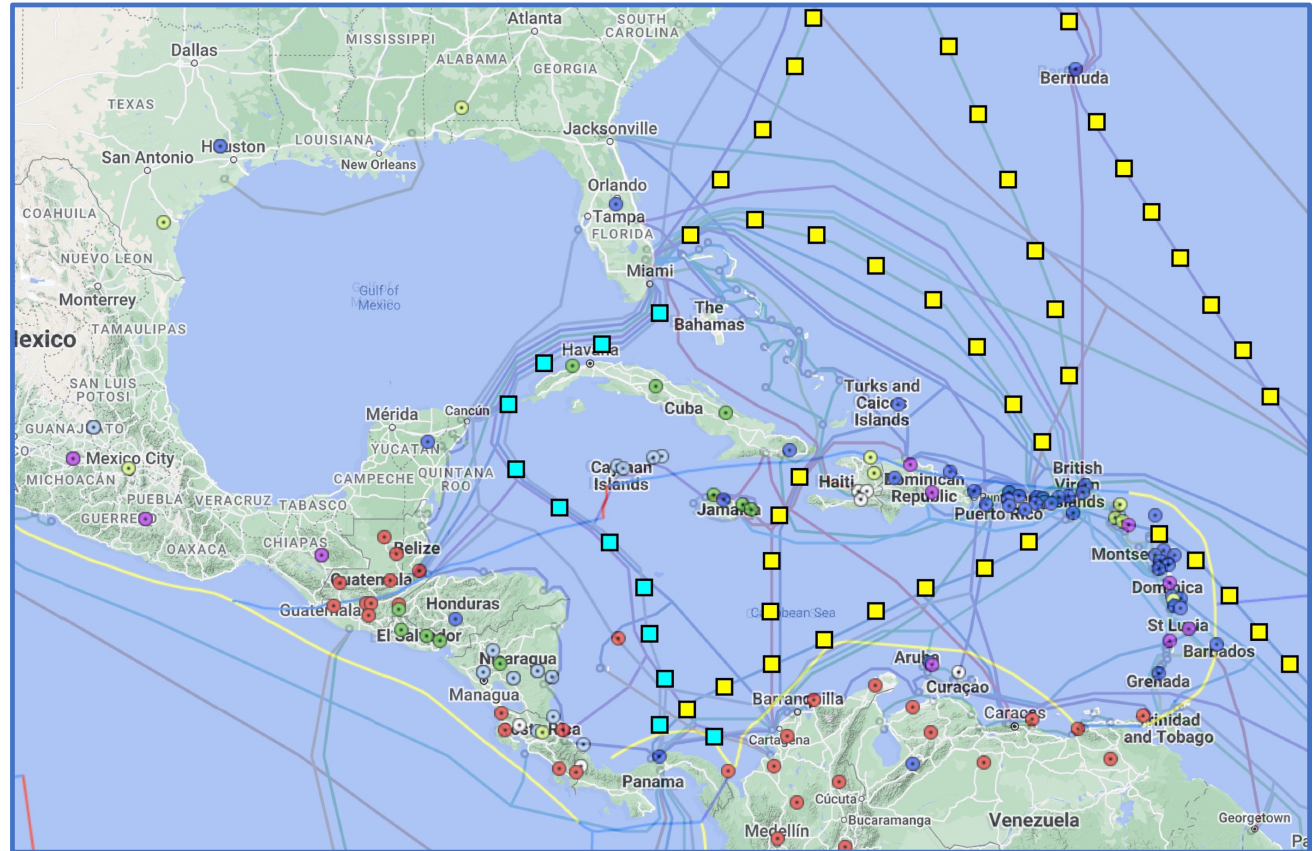
Detection Times for Earthquakes (at 4th station)

Dr Elizabeth A Vanacore,
Chair Task Team CARIBE WAVE 2

elizabeth.vanacore@upr.edu

Example CARIBE SMART Cable Concepts

- Older cables in CARIBE-EWS region scheduled for replacement in next 1-6 years
- Prime opportunity to include SMART Cables in region
- Enhance current CARIBE seismic and tsunami detection capabilities
- Improve societal resilience
- Protect / harden telecom infrastructure
- Multiple suppliers available to produce systems



Circles: Existing CARIBE-EWS seismic stations
Squares: Notional SMART Cable sensor systems

Courtesy Dr. Matt Fouch, Subsea Data Systems



SMARTCables.org

[ITU/WMO/UNESCO-IOC Joint Task Force](#)



Scan to Join!

Danke Gracias ありがとう Thank you 谢谢 Xièxiè Arigatō Dhanyavaad
Merci Tankyu tumas Terima kasih Takk Grazie Mālō 'aupito Kop koon
Salamat po S' efharistó