

## **Roadmap for UN sponsor agency UNESCO-IOC in SMART Cables Initiative**

This roadmap provides a comprehensive plan for advancing the SMART Cables initiative, highlighting its contributions to climate monitoring, disaster risk reduction, and ocean science. By integrating robust governance, targeted research and development, and global collaboration, this initiative aims to establish a transformative network of SMART-enabled subsea cables to address critical challenges in ocean sustainability and resilience. This Initiative works in a coordinated way with three UN sponsor agencies, ITU, WMO and UNESCO-IOC.

**Objective:** To explore the feasibility of widespread deployment of scientific instrumentation on deep-ocean fiber-optic cables to enhance capabilities for climate monitoring, tsunami detection, and disaster mitigation.

### **Strategic Objectives and Outcomes**

1. **Enhanced Climate Monitoring:** Use SMART cables to observe ocean heat content, circulation, and sea-level rise for a better understanding of climate change impacts.
2. **Improved Disaster Mitigation:** Leverage SMART cables to provide real-time tsunami and earthquake early warnings, reducing risks to coastal communities.
3. **Global Coordination and Standards:** Establish SMART cables as a global standard for ocean observation through collaboration with GOOS and ITU standards.
4. **Capacity Building:** Support sustainable development and foster global participation through training, partnerships, and equitable resource distribution.

### **Research and Development Priority Areas**

1. **Environmental Sensing Integration:** Expand the deployment of sensors for temperature, bottom pressure, and seismic motion to enhance ocean and disaster data collection.
2. **Data Integration and Sharing:** Ensure seamless data integration with global systems like WIS 2.0 and promote open access to support science and policy.
3. **Key Projects Advancements:** Accelerate progress on projects like Atlantic CAM, Tamtam, and InSEA Wet Demo, as well as new initiatives like Chile-Antarctica feasibility studies.
4. **Tsunami Detection Algorithms:** Develop advanced algorithms for real-time tsunami and earthquake detection to improve response times.
5. **Ocean modeling and data assimilation:** Modify and adapt operational models to be able to assimilate the observables (ocean bottom temperature and pressure) without loss of information.

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6. **Global Deployment Guidelines:** Build on ITU's G.SMART recommendations to establish standardized protocols for SMART cable installations worldwide.

### **Governance and Structural Arrangements**

- **Leadership and Coordination:** The Joint Task Force SMART Cables leads in collaboration with UNESCO-IOC, ITU and WMO.
- **Committees:** Leverage JTF's committees (e.g., science and society, engineering, data management) to oversee technical and operational aspects.
- **Stakeholder Inclusion:** Maintain active participation from over 300 members across academia, industry, and governments to ensure diverse input, including member states of all around the globe to participate.
- **Regional Engagement:** Strengthen local initiatives in underrepresented areas such as South America, SIDS, Caribe and others through regional workshops and partnerships.

### **Engagement and Communication Plan**

1. **Awareness Campaigns:**
  - Highlight the societal benefits of SMART cables at global events (e.g., Honolulu JTF Workshop, Submarine Networks EMEA, etc.).
  - Showcase milestones like Atlantic CAM and Tamtam contracts.
2. **Collaborative Partnerships:**
  - Engage with regulatory, legal, and security bodies to streamline implementation.
  - Foster public-private partnerships to support funding and deployment.
3. **Education and Advocacy:**
  - Promote ocean literacy through training programs and outreach targeting governments, academia, and communities.
  - Develop educational materials emphasizing climate and disaster resilience.

### **Monitoring and Evaluation**

- **Key Milestones:**
  - Completion of feasibility studies for Chile-Antarctica cable.
  - US NSF Antarctica SMART Cable workshop in 2025.

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- Installation of Atlantic CAM and Tamtam SMART systems by 2026.
- Integration of SMART cable data into WIS 2.0.
- **Performance Metrics:**
  - Reduction in tsunami and earthquake detection times.
  - Number of SMART-enabled cables operational worldwide.
  - Level of integration with international warning systems and operational oceanography centers.
  - Number of peer reviewed papers

## **Phases and Milestones**

### **Phase 1: Establish Foundation and Define Scope (0-12 Months)**

- **Milestones:**
  - Recognition of SMART cables as an Emerging Ocean Observing Network under GOOS (2024).
  - Secure funding from partners like the EU and Asian Development Bank.
- **Deliverables:** Feasibility studies and funding commitments.

### **Phase 2: Projects Implementation (12-36 Months)**

- **Milestones:**
  - Contracts signed for Atlantic CAM and Tamtam systems.
  - Testing and calibration of sensors in deployments.
  - Setting technical process for integration of SMART cable data with GOOS.
- **Deliverables:** SMART Cable Installation and Calibration Reports.

### **Phase 3: Data Integration and System Evaluation (36-60 Months)**

- **Milestones:**
  - Operational integration of SMART cable data into global systems like WIS 2.0.
  - Evaluation of project performance.
- **Deliverables:** Performance and Data Integration Reports.

### **Phase 4: Scaling and Global Implementation (60-120 Months)**



The JTF SMART Subsea Cable Initiative  
*Science Monitoring And Reliable Telecommunications*  
Climate Monitoring and Disaster Mitigation

- **Milestones:**
  - Deployment of SMART cables in new high-risk regions (e.g., Chile-Antarctica, Northern Hemisphere).
  - Establishment of global deployment guidelines.
- **Deliverables:** Global SMART Cable Standards and Deployment Guidelines.

