

NATO Advanced Research Workshop (ARW) G8597

“Science for Recovery of Ukraine”

Follow-Up Document for Participants

University of Strasbourg (France), 3–5 February 2026

Follow-Up Document

This document summarizes the key findings, identified opportunities, follow-up actions, and strategic recommendations resulting from the Advanced Research Workshop (ARW) “Science for Recovery of Ukraine,” organized under the NATO Science for Peace and Security (SPS) Programme and hosted at the University of Strasbourg (France).

The workshop brought together 30 participants representing international institutions, programs and initiatives, Ukrainian governmental authorities, universities, research institutions, and technology developers to translate Earth Observation (EO), geospatial data analytics and Artificial Intelligence (AI) capabilities into operational solutions with the aim of sustainable recovery of Ukraine.

1. Findings

1.1 Geospatial Infrastructure as a Core Recovery Enabler

The workshop identified open and interoperable geospatial infrastructure as a prerequisite for effective recovery and the important role of Earth Intelligence (EI) including EO satellite data. Current constraints include limited data accessibility, data completeness and actuality, fragmented standards, duplication of mapping efforts across ministries, and poor inter-agency coordination.

Priority actions include strengthening the National Spatial Data Infrastructure (NSDI) through systematic acquisition of high-resolution satellite and airborne orthophotos, development of authoritative and harmonized vector datasets, implementation of unified metadata standards, and establishment of clear data governance procedures. Alignment with the registration and monitoring requirements in Rapid Damage and Needs Assessment (RDNA) sectors and EU Acquis requirements (Chapters 11, 13, 27) is required to ensure “generate once, use often” principles and interoperability with donor and regulatory frameworks (e.g., Common Agriculture Policy - CAP).

The workshop proposed setting up an interagency Science Needs Working Group to identify and prioritize EI data needs and initiatives associated with national recovery across different agencies. The group would help reduce duplication of effort across agencies and prioritize national data efforts to maximize impact.

1.2 Digital Sovereignty and Operational Autonomy

Digital sovereignty was identified as a strategic priority. Ukraine should reduce critical dependence on external “big-tech” ecosystems for data processing and analytics.

The workshop supported establishing a Center of Excellence in Earth Intelligence, with the National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute” (NTUU “KPI”) as the institutional nucleus. The Center would develop national data-processing pipelines, ensure compliance with NATO security standards, support ministries with policy advice and technical specifications for operational tools, provide specialized education, and ensure alignment with EU Acquis requirements (Chapters 11, 13, 27).

1.3 Dual-Use Technologies and Security Relevance

Ukrainian has expertise in UAV/UXV systems, satellite monitoring, AI-supported situational awareness, war damage detection, and cybersecurity was assessed as being globally competitive.

Integrated satellite–UAV platforms, combined with a renewed geospatial data infrastructure, are directly applicable to (military) infrastructure monitoring needs, demining and hazardous area assessment, agricultural logistics and land monitoring, environmental damage assessment, and monitoring and protection of critical infrastructure. These dual-use capabilities strengthen national resilience and provide a technological basis for structured cooperation within NATO frameworks.

1.4 Human Capital and Workforce Gap

A systemic shortage of trained specialists in geospatial analytics, AI, and operational Earth Intelligence was identified. A pipeline is needed to feed trained specialists into government agencies and the private sector. Reintegration of veterans into analytical and geospatial roles was recognized as a potentially high-impact social and technological solution.

National space programs should shift from its current hardware-focused priorities to data-centric Earth Intelligence frameworks, emphasizing operational data processing pipelines, interoperable platforms, service provision, and AI-driven analytics that directly support national policy and reconstruction decision-making.

2. Opportunities

2.1 NATO SPS Multi-Year Cooperation

Participants agreed to prepare a concept for a multi-year NATO SPS proposal focused on Earth Intelligence and dual-use technologies. The objective is to shift from a workshop format to sustained R&D implementation, through continued engagement with the related government agencies.

2.2 EU and ESA Integration

Clear pathways were identified for deeper integration with ESA collaboration mechanisms, EU Copernicus Services, Horizon Europe projects, and monitoring frameworks aligned with the EU Common Agricultural Policy needs. Alignment with EU research and regulatory systems strengthens Ukraine’s EU accession trajectory and ensures interoperability with European infrastructures.

2.3 Scientific Dissemination

A peer-reviewed Focus Issue in *Environmental Research Communications* (IOP Publishing) was proposed and agreed upon with the title: “**Focus on Innovative Technologies for Post-Armed Conflict Recovery**”. Submission deadline: 30 September 2026.

2.4 Institutional Consolidation via a Center of Excellence

The proposed Center of Excellence in Earth Intelligence (EI) would consolidate and strengthen national geospatial and AI expertise, coordinate NATO- and EU-funded EI research and implementation projects, and provide ministries with operational EO/AI-based decision-support. It would also support Master’s, PhD, and professional training programmes, including in geospatial AI, aligned with reconstruction priorities, government tasks, and industry needs. This structure would

address current institutional fragmentation and workforce gaps, while establishing a stable framework for long-term technological and operational resilience.

3. Follow-Up Actions

Immediate (0–6 months):

- Submit the official NATO Final Report (within 45 days).
- Launch the *Environmental Research Communications* Focus Issue, prepare and coordinate manuscripts.
- Submit a multi-year NATO SPS proposal.
- Formally disseminate the workshop report to the State Space Agency of Ukraine, the Ministry of Digital Transformation, and the Ministry of Education and Science, and recommend activation of the proposed Scientific Needs Working Groups.
- Revise the NTUU “KPI” Space Program toward a data-driven Earth Intelligence model.

Medium-term (6–18 months):

- Launch multi-year projects on innovative satellite technologies for the recovery of Ukraine, tied to the priorities identified by the Science Needs Working Group.
- Integrate a renewed geospatial data infrastructure and EO/AI tools into RDNA processes.
- Present results at international donor and policy forums (e.g., GEO, COP, EU-level events).
- Modernize curricula at NTUU “KPI” in line with Earth Intelligence priorities.

Long-term (18+ months):

- Formally establish the Center of Excellence in Earth Intelligence.
- Institutionalize coordination mechanisms between academia, ministries and industry.
- Scale validated EO/AI systems into routine ministerial operations.

4. Recommendations

1. Operationalize Mature EO/AI Systems. High-level TRL (technology readiness level) technologies must be transitioned into operational use for damage assessment, agricultural monitoring, and environmental compliance with the existing and forthcoming policies. Legislative efforts should be made to incorporate Earth observation data (and geospatial data in general) into the legal frameworks for decision-making.

2. Invest in National Geospatial Infrastructure. Prioritize national high-resolution orthophotos, authoritative vector layers, and NSDI updating and harmonization. Open data principles should be implemented alongside NATO-compliant security protocols.

3. Strengthen EU Alignment. Ensure synchronization with ESA, Copernicus, Horizon Europe, and CAP frameworks. This alignment is critical for EU integration and long-term funding eligibility.

4. Consolidate Academic Leadership. Codify the role of NTUU “KPI” as a national coordination hub (through the Center of Excellence) for Earth Intelligence, AI, and space-data analytics, supporting institutional continuity.

5. Institutionalize Mechanisms for Science-to-Policy Transition. Revitalize ministerial Science Councils or equivalent advisory structures to ensure scientific findings are systematically translated into policy, their implementation, and decision-making.

Concluding Statement

The ARW successfully transitioned from strategic dialogue to structured action planning. It positioned Ukraine not solely as a beneficiary of international assistance but as a contributor of advanced Earth Intelligence, AI-driven monitoring systems, and dual-use technologies relevant to NATO and EU frameworks.

Sustained coordination, institutional consolidation, and rapid operationalization of validated EO/AI tools are now essential to transform workshop outcomes into measurable recovery impact.

The participants are encouraged to remain actively engaged in follow-on initiatives, joint proposals, and publication efforts to ensure continuity of the established cooperation network.