Climate and Disaster Resilience Pilot 2024

Chapter 1. Stakeholder-centric Pilot will accelerate our readiness for climate change and related disasters by optimizing on-demand information to better understand, trace, mitigate, adapt, and respond.

The Open Geospatial Consortium is offering sponsorship opportunities to support the OGC Climate & Disaster Resilience Pilot 2024 (CDRP24). This pilot is a follow on of the successful 2023 Climate Resilience Pilot and Disaster Pilots. In an effort to more effectively impact both the disasters and climate services and decision maker communities OGC is unifying these two pilots into one.

The intent is to:

- Enhance climate and disaster services by moving the underpinning technical systems towards FAIR Climate & Disaster Services; collaborative and equitable Findable, Accessible, Interoperable, and Reusable systems for information on demand to understand, trace, mitigate, adapt, and respond.
- Build sustainable relationships between science domains, researchers, decision makers, data & systems providers. Tailor innovative solutions that promote community and environmental resilience across disparate science and social domains accordingly, by better identifying stakeholder requirements towards information and knowledge needs.
- Improve visualization, use case driven simulations and communication approaches.
- Improve interactivity and interchanges with OGC's sponsors, members, and participants to ensure greatest applicability and broader pilot project scope and impact.

while building upon the lessons learned from all the past pilots. The OGC Climate and Disaster Resilience Pilot 2024 is therefore the next phase of an OGC disaster and climate initiative which has run for more than five years with multiple focus areas and cycles where specific technical challenges are tackled.

Interested Sponsors of this CDRP24 Pilot please contact the OGC Collaborative Solutions and Innovation Program (COSI) via the OGC Innovation Program contact form. **Applications for Sponsorship close September 22, 2024.**

Chapter 2. Vision

The objective of the Climate and Disaster Resilience Pilot 2024 is to accelerate our collective readiness for climate change and their related disasters by enhancing the value chain that transforms raw data to climate and disaster information, for the benefit of decision makers.

The concept is to have individual threads within the same pilot working towards specific end user, stakeholder, and technical goals that can advance either or both climate and disaster understanding and readiness while also inducing desired collaboration between the separate but interlinked domains. This is being done by accessing, fusing, and analyzing data from the climate change modeling community with earth observation and social science data in order to contribute to the global push for achieving climate change resilience. Additionally, by including all stakeholders from end user to data providers and the many science and responder systems that must be FAIR and Analysis Ready Data (ARD) and Decision Ready Indicators (DRI) ready this will be achieved. Our goal is to develop a reliable foundation from science services to users for climate change and disaster actions. For this purpose, OGC members engaged in this pilot will continue to develop a series of demonstrators that may include but are not limited to workflows, community collaborations, technical advances in APIs, etc. The demonstrators will show the integration and combined exploitation of data including, but not limited to numerical model data, EO data, and data from social science. Once developed they can be integrated into the Open Science Persistent Demonstrator, which aims to demonstrate interoperability amongst emerging Earth observation and science technologies and infrastructures accompanied with capacity building, provenance and learning material.

While the latest Climate Resilience and Disaster Pilots investigated interoperable techniques for creating visualization and communication tools along with advancing ARD and DRI to enhance access and resilience, the aspects of information flows for emergency decision making for both climate and disaster still do not integrate well for the benefit of both communities as well as for the benefits to society. These aspects, with a focus on wildland fire, drought, heat, land degradation, floods, and landslides & debris flows will be included in the CDRP24.

A number of international policy initiatives over the last three decades have been striving to limit the triple crisis: climate change, loss of biodiversity and pollution. Additionally, there is an effort to reverse land degradation, protect finite natural resources, and reduce the risks associated with environmental disasters. These policy initiatives are oriented by the umbrella of the United Nations Agenda 2030 and the Sustainable Development Goals (SDGs), which together aim at building the resilience of people and systems to new environmental and socioeconomic conditions in the future. Meanwhile disasters risk reduction initiatives similarly focus on mitigation, preparedness, response, and recovery while working with communities towards resilience to disasters. Beyond political will, achieving these objectives and tracking progress requires science, reliable data and interoperable technology. OGC participates as co-chairs and presenters in the many Global communities working within the climate domain and introduces the advancements and capabilities of open science and open solutions within the UN, CEOS, GEO, and other related organizations.

In contrast to the previous Pilots, where the approach was following the value chain from raw data to climate or disaster information the upcoming pilot will be following an stakeholder

centric approach.

Chapter 3. Focus Areas

The OGC CDRP24 will be executed around thematic areas that involve the detection, tracking, and response to selected phenomena , focusing on both technical and science domain issues. The CDRP24 focus is to develop capabilities and practices that are able to address the full cycle of climate and disaster awareness across a wide range of individual and combined hazards, including but not limited to:

- Flooding and Inundation
- Extreme Heat and Cold Waves
- Droughts, desertification and land degradation
- Landslides – Debris Flows
- Wildland Fires

Technical concentrations will include, but are not limited to:

- Datacubes
- Processing services
- Analysis Ready Data (ARD) - Decision Ready Indicators (DRI)
- Simulations/data visualizations

Chapter 4. Technical Scope

The technical scope of the Pilot will revolve around a set of significant technology trends and related standards that apply to the requirements of the stakeholders:

1. Optimization of the value chain from raw data to climate and disaster information: sophisticated observation instruments and networks, coordinated modeling experiments, scientific assessments, global data access infrastructures and analytical capacity to find, access, process and translate data into relevant use-case specific information on demand.
2. Hybrid applications-to-the-data EO cloud exploitation platforms that seamlessly bring imagery and other data streams into scalable cloud environments where advanced processing and algorithms can be directly and flexibly applied to them.
3. On-demand provisioning of datacubes and Analysis Ready Data (ARD) to local analysts and field responders through modern convenience API’s and mobile-ready online-offline Geopackage tools creating Decision Ready Indicators (DRI).
4. Mechanisms to systematically track, integrate, and document the provenance of multiple aggregated sources of data.
5. Web publication of "structured data" that connects well-known local geography with up-to-date conditions, observations, and predictions. Edge computing systems that provide local, actionable information based on local sensors such as interpretation of flooding activity from deployed cameras.

There are a number of other trending technologies and standardization activities that could additionally be supported in order to investigate their potential to improve disaster response. The OGC Climate and Disaster Pilot 2024 will focus on advancing integration of systems towards end user and provider advantage to improve resilience in climate change and disasters.

Chapter 5. Design Inputs

The Pilot thematic focus areas and technical scope described above clearly just begin to address the many serious challenges to effectively address climate and disaster concerns, particularly in addressing the needs of end users, whether they be global and national officials, local decision makers, impacted populations, first responders, or others. CDRP24 sponsors will have the opportunity to provide additional inputs into the design of the activity with the potential to further improve the ability of key decision makers and responders to discover, manage, access, qualify, share, and exploit location-based information in support of understanding, preparedness, and response.

Chapter 6. Opportunity

2022 Sustainable Value Study: “The survey finds companies taking decisive action to combat climate concerns are benefiting from unexpected financial value in areas like revenue growth and earnings, with 7 in 10 seeing financial benefits that exceed their expectations.”

Government and industry financing of systems to better understand, track, mitigate, and address climate and disaster requirements often lead to greater societal benefits, increased profits, and reduced costs.

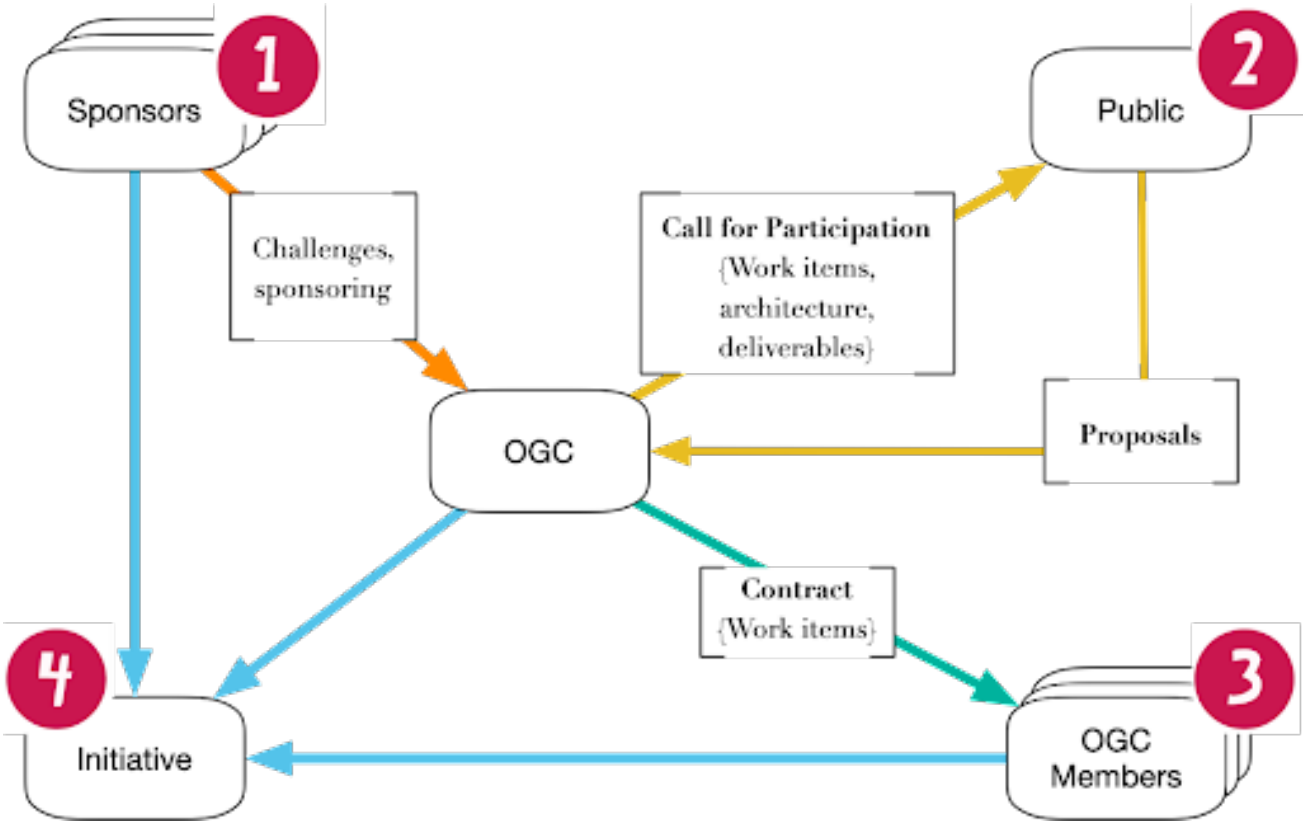
Government agencies worldwide are producing huge streams of observation data, industry is innovating with remarkable analytics and AI tools, and yet climate and disaster understanding such as disease, wildland fires, land degradation, and flooding are still creating almost unimaginable social and economic impacts. What is missing? A critical component is that these amazing systems still don’t talk to each other. The whole is less than, not greater than the sum of the parts.

With the OGC Climate and Disaster Resilience Pilot 2024, the participants have the opportunity to help put the puzzle pieces together that connect the people, the data systems, and the research, forming a pattern that supports understanding change and adapting to any region with any combination of data sources and tools.

What OGC and its industry, government and academic sponsors do is to make it easier and faster to fit those puzzle pieces to the pattern when needed, because the immense array of complex combinations of technological, architectural, standardization and operational requirements have been rigorously tested and documented in past OGC initiatives such as the Climate and Disaster Pilots.

Chapter 7. About the OGC Collaborative Solutions and Innovation (COSI) Program

The OGC COSI Program is an innovative, collaborative, and hands-on engineering and rapid prototyping program. In the COSI, OGC members bring forward technology and technology integration challenges. These challenges are refined and mapped to a set of requirements, use cases, and implementation plans and eventually addressed in different types of initiatives. These initiatives bring OGC vendors and research institutions together with sponsoring organizations. Coordinated and managed by the OGC COSI Team, each initiative has the goal to stepwise increase Technology Readiness Levels (TRL) for geospatial IT solutions, including software architecture, interface design, information and data models, as well as related standards and specifications. Run globally, the COSI Program further validates and tests geospatial technology based on OGC standards, identifies future OGC standardization work items, and builds know-how in applying existing standards to real world spatial data sharing challenges.



Throughout the COSI Program initiatives OGC continually meets and works with the sponsors, the participants, and the public ensuring information is readily available and everyone is aware of progress and plans.

Chapter 8. Call to Action

Interested in joining OGC as a Pilot supporter? Please contact COSI Directors, Marge Cole, Trent Tinker, or Nils Hempelmann, via the OGC Innovation Program contact form

Chapter 9. Timeline

The following figure illustrates the tentative timeline. The OGC Team will work with sponsoring organizations to adjust the timeline based on funding and timing constraints.

Milestone	Date	Event
M01	Oct 1, 2023	Public Release: Call for Participation
M02	Nov 15, 2022	Close of Call for Participation
M03	Dec 01, 2023	Kick-off Workshop
M04	Dec 05,2023	preliminary presentation at OGC Innovation Days
M05	Feb 15, 2024	Delivery of intermediare Engineering Reports by participants
M06	Feb 2024	Preliminary DEMO at OGC Member Meeting
M07	May 31, 2024	Submission Candidate for Engineering Report
M08	June 15, 2023	aggregated DEMO at OGC Member Meeting Climate Resilience DWG
M09	July 31 2023	Development of call for participation for next initiatives