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Co-Creating Cloud-Based Tools for Urban Climate-Resilience: The CLIMRES Project

Claudio Pisa¹, Marica Antonacci¹, Vasileios Baousis¹, Sotirios Aspragkathos², Iasonas Sotiropoulos², and Stamatia Rizou²

¹ECMWF, Reading, UK (claudio.pisa@ecmwf.int)

²SingularLogic S.A., Cholargos, Greece (srizou@singularlogic.eu)

Europe faces a growing frequency of extreme weather events, from heatwaves and floods to wildfires and earthquakes, increasingly threatening urban environments. Unusually warm winters are becoming progressively common, destabilizing ecosystems and altering traditional weather dynamics.

Addressing these crucial changes, the CLIMRES project aims to foster a “Leadership for Climate-Resilient Buildings” by identifying and categorizing vulnerabilities within the built environment and assessing their effects within urban systems. This effort integrates diverse data sources, including Copernicus services, IoT networks, and municipal datasets, and considers hazard warnings and weather forecasts. Moreover, a liaison with the Destination Earth initiative enhances the project with the capacity to leverage extreme weather predictions and future climate models.

CLIMRES aims to deliver vulnerability assessment and impact evaluation methodologies, along with a “hub of measures” inventory for cost-effective building design and materials against climate risks, as well as decision support tools, to aid building owners, policymakers and stakeholders in planning effective interventions and to address vulnerabilities, targeting three levels of decision making at strategic, tactical and operational levels. The project deploys cloud technologies like OpenStack and Kubernetes to host an interoperable platform for vulnerability analysis, data harmonization, and decision-making. Its solutions will be tested and validated on 3 Large Scale Pilots in Spain, Greece, Italy, and Slovenia, addressing hazards such as heatwaves, flooding, fires, and earthquakes. A multi-hazard replication pilot in France will further evaluate the scalability and versatility of these approaches across diverse contexts.

Insights from these pilots will feed into a replication roadmap and a capacity-building program designed to train future leaders in climate-resilient urban development. By fostering co-creation with local stakeholders and communities, CLIMRES ensures its innovative solutions are practical, cost-effective, and replicable, targeting Technology Readiness Levels (TRL) 6-8.

CLIMRES aims to bridge innovation with actionable solutions, equipping building owners, policymakers, and communities with the tools needed to enhance urban climate resilience. This presentation highlights the project's interdisciplinary approach, outputs and technological underpinnings, offering insights into scalable solutions for climate adaptation in urban settings.