VALIDATED LOCAL RISK ACTIONABLE DATA FOR ADAPTATION

CHAMPION STORY #3
APRIL 2026

Supporting Climate Change Risk Management in the Statutory Cities of Přerov & Mladá Boleslav (Czechia)

The Challenge

Přerov is a medium-sized city (58,45 km²) in the Olomouc Region of the Czech Republic with a population of 41,634. Mladá Boleslav (28,9 km²) is the second most populated city in the Central Bohemian Region, with a population of 45,000 and is located about 45 km northeast of Prague.
Both cities are crossed by rivers, the Bečva River for Přerov, and the Jizera River (at its confluence with the Klenice River) for Mladá Boleslav. Neither cities have a particularly mountainous landscape with Přerov's highest point being the Čekyňský kopec at 307 m above sea level (in Nízký Jeseník range) and Mladá Boleslav's highest point being the Chlum hill, at 301 m above sea level. Přerov is mainly made up of agricultural or forested land, whereas Mladá Boleslav has a slightly smaller share of agricultural and forested land. Mladá Boleslav is a major centre of the Czech automotive industry featuring the headquarters of the the Škoda Auto company. Přerov is also a seat of industrial activities with several large companies operating in different economic areas.

In both cities, climate change is manifesting through increased average temperatures, altering the character of both summer and winter seasons. These changes bring about more intense and erratic precipitation patterns, posing challenges for urban water management and increasing the risk of both flooding and droughts. The urban heat island effect exacerbates discomfort during peak summer months, while air quality issues may become more pronounced, affecting public health. The local ecosystems, including urban green spaces, face pressures from the shifting climate, impacting biodiversity and recreational areas. Economically, sectors such as agriculture, manufacturing, and tourism might need to navigate the challenges and opportunities presented by a changing climate.

Figure 1 - Location of the statutory cities of Mladá Boleslav & Přerov, Czech Republic

In Přerov, overheating and drought stress are most visible in the dense city centre, in surrounding agricultural zones and around the airport area, where large impervious surfaces limit cooling and infiltration. During intense rainfall, small watercourses (including the Olešnice stream) and constrained drainage capacity can trigger fast-onset flooding that affects transport links and nearby assets.
While in Mladá Boleslav, high surface temperatures are pronounced in the city centre and around the Škoda Auto industrial complex, where large built-up areas and paved surfaces intensify heat. Drought affects peri-urban agricultural landscapes, while the Jizera river corridor can concentrate flash-flood exposure for riverside infrastructure and connected transport routes.

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A Climate Impact Chain (CIC)[1] was generated for both cities, translating local knowledge into a transparent driver → hazard → exposure/vulnerability → impact logic that can be operationalised through indicators.

For Přerov, the CIC focused on the degradation of urban ecosystems under increasing heat and drought: long-term warming, water stress and land-use change can weaken ecosystem services, increase pest and pathogen pressure, and reduce the cooling function of urban green areas. For Mladá Boleslav, the CIC addressed issues related to high temperatures and public health within the context of transportation systems, linking extreme heat to its impacts on the health of residents and commuters, exposure to such heat along transportation routes and in public spaces, and the role of infrastructure design (shading at transit stops, types of surfaces in the surrounding area, planting of trees and green corridors) in mitigating risks.

SDG 13: Climate Action calls for urgent action to combat climate change and its impacts by strengthening resilience and adaptive capacity worldwide. It emphasizes the integration of climate measures into national policies, strategies, and planning (Target 13.2), and the need to improve education, awareness, and institutional capacity for climate change mitigation, adaptation, and early warning (Target 13.3).

How can VALORADA help ?

In response to the increasing climate pressures faced by Přerov and Mladá Boleslav, the VALORADA project developed a set of climate indicators designed to improve the understanding, and monitoring, of the area's exposure to key climate risks.

The process began with the creation of an initial list of indicators to characterise and quantify the interaction between territorial, environmental and socio-economic factors and changing climatic conditions. These indicators form the backbone of the regional analysis, providing the basis for evidence-based adaptation strategies. From this initial set, the most relevant indicators were selected in collaboration with regional stakeholders, reflecting Přerov and Mladá Boleslav's specific climatic, geographical and socio-economic characteristics. These include:

- Urban heat & health: hot-day and tropical-night indicators, heatwave duration, land surface temperature hot spots, and indicators describing shading/cooling capacity.
- Urban ecosystems & green infrastructure: vegetation condition (greenness/ Normalized Difference Vegetation Index (NDVI) anomalies), tree-cover and imperviousness metrics, drought stress indicators, and indicators describing green-area functionality and accessibility.
- Heavy rainfall & flash-flood exposure: intense precipitation indices, runoff/retention potential, flood-prone area mapping (where available), and exposure of people, properties, critical assets and transport links.

Following the indicator selection, the next step was to identify and prepare the local data sources needed to compute each indicator. This required collecting and formatting a broad set of non-climate spatial datasets—such as demographic, agricultural, infrastructure and land-use information—often provided through municipal or local authorities (e.g., green inventories/passports, asset registers, land-use layers, and flood-risk mapping). During this phase, several challenges emerged, notably restrictions on data access and inconsistencies with INSPIRE compliance standards.

[1] The Climate Impact Chain (VALORADA public deliverable 2.1: https://valorada-project.eu/downloads/) shows climate change mainly through higher temperatures and shifting rainfall patterns, which together intensify compound hazards—heatwaves and drought that raise wildfire risk, alongside episodes of extreme precipitation. These interconnected pressures create cascading impacts across water, ecosystems, land management and exposed assets, highlighting why impact chains are useful to trace how hazards turn into risk and where vulnerabilities amplify impacts.

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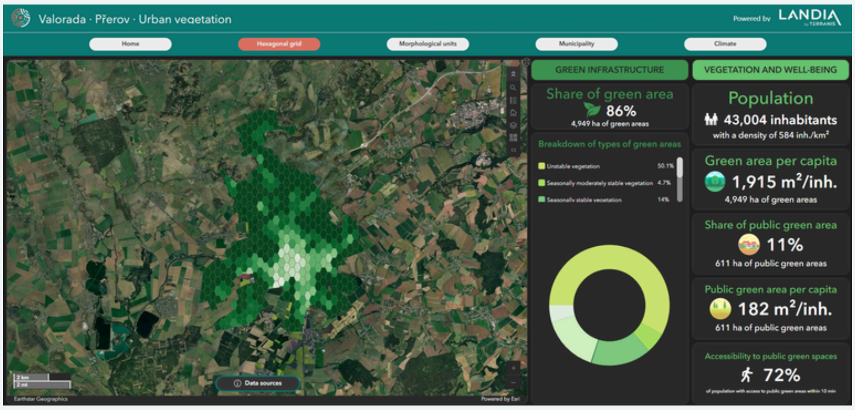
To complement these local inputs and ensure a consistent, scientifically robust basis for baseline analysis and scenario comparison, climate datasets were sourced from Copernicus (via the Copernicus Climate Data Store, supporting baselines and future projections). These include mean temperature, number of tropical nights, days of extreme precipitation, extreme wind events and flood occurrence. In the dashboards, these climate layers are combined with Copernicus Land Monitoring Service products (land cover, imperviousness, tree cover) and satellite-derived layers from Sentinel-2 and Landsat (vegetation indices and temperature, with LST still in progress) to provide a harmonised view across hazards, exposure and local assets.

Přerov and Mladá Boleslav provided a significant portion of the data for the dashboards. This includes data on the floodplains of individual rivers and data on building types (residential/non-residential), which were used to calculate the share of the population at risk of flooding. They also provided data on erosion levels over the past 5 years, and the types of crops grown in fields in 2024 and 2025, which were important for calculating future irrigation needs.

They also provided data for a forest monitoring dashboard, which originally only contained general, outdated CORINE Land Cover data. As well as CORINE Land Cover, the dashboard now features a detailed analysis of forest types from 2021 to 2023. This makes it possible to track which forest types are declining and where they are declining.

The resulting VALORADA dashboards for Přerov and Mladá Boleslav provide a comprehensive and user-friendly overview of the region's climate and vulnerability indicators, bringing together climate baselines and projections, EO monitoring of land cover and vegetation dynamics, and city-owned datasets into a single, decision-ready evidence base for urban adaptation planning.



ACCESS THE PLATFORM HERE

Figure 2 VALORADA Dashboard for Přerov

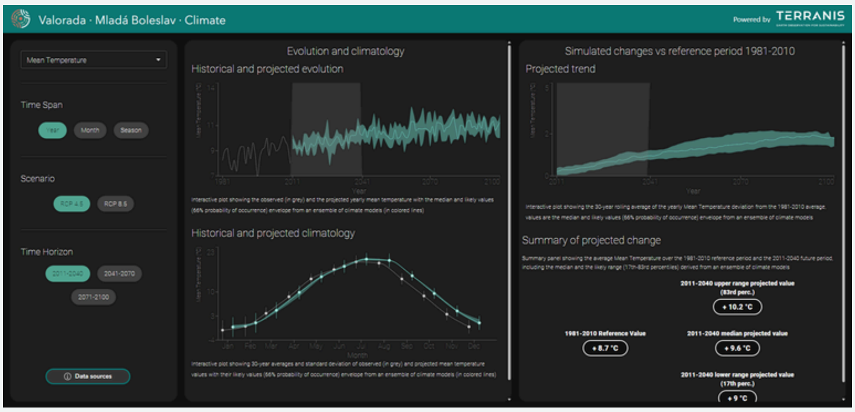


Figure 3 VALORADA Dashboard for Mladá Boleslav

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More specifically, the Czechia demonstrators support three core issues: identifying vulnerable green areas and key green-infrastructure elements that provide cooling and retention services; tracking and stress-testing how green functional areas may evolve under future climate conditions (heat/drought); evaluating and prioritising additional nature-based solutions and retrofitting measures to improve resilience and long-term liveability.
By consolidating these diverse data streams, the dashboard becomes a practical tool for the Přerov and Mladá Boleslav city administration and local stakeholders. It supports their efforts to identify emerging risks, prioritise adaptation measures and monitor progress in reducing vulnerability over time. Most importantly, it transforms scientific and statistical information into actionable insights, helping decision-makers to strengthen resilience and adaptation policies and actions.

Who is concerned?

In Přerov and Mladá Boleslav, the organisations most directly concerned are the city administrations because they are the level of governance that must turn climate risk into concrete decisions on streets, parks, drainage, public buildings and everyday services. Both municipalities have already formalised this responsibility through local policy instruments: Přerov's Climate Change Adaptation Strategy (2021–2030) focuses on the city's priority threats (heatwaves, drought and floods) and the measures needed to reduce risk while improving liveability. Mladá Boleslav likewise developed an adaptation strategy (supported via EEA/Norway Grants), establishing a risk-based framework and a pipeline of measures for city officials and residents.
This municipal action sits within a wider Czech policy framework. Adaptation is coordinated nationally through the Strategy on Adaptation to Climate Change in the Czech Republic (2021–2030) and its implementing National Action Plan on Adaptation to Climate Change (updated for 2021–2025), approved by the Czech Government (Resolution 785 of 13 September 2021). These national instruments provide the overarching direction (risk management across sectors such as water, health, urban areas, transport and emergency protection) while local authorities operationalise it through territorial planning, investment programming and service delivery.
At the same time, municipal decisions are anchored in the Czech Republic's spatial planning system, where the municipal "Územní plán" (local territorial plan) is the binding instrument that shapes land use, development conditions and the location of infrastructure and green space, precisely the levers needed for heat mitigation, retention and flood-risk reduction. VALORADA's role is to connect this planning reality with a shared, traceable evidence base so that climate considerations can be integrated more consistently into local plans, maintenance priorities and investment choices.

These policies are themselves aligned with the EU level framework, including: the EU Strategy on Adaptation to Climate Change (2021), which calls for all regions and cities to become more resilient by 2050, emphasising improved data, risk assessment and cross-sectoral coordination[2]; the European Climate Law (Regulation (EU) 2021/1119) which establishes adaptation as a legal obligation, requiring Member States to develop coherent national and regional adaptation strategies and to report regularly on progress to support climate-resilient development in line with the Paris Agreement; and the Regulation on the Governance of the Energy Union and Climate Action (EU) 2018/1999 which imposes reporting obligations that require regions to contribute data and updates on adaptation policies, actions, and observed impacts[3].

[2] This strategy will be complemented by a new integrated framework for European climate resilience and risk management, which should be adopted by the end of 2026. This new framework aims to overcome existing barriers to climate adaptation and acknowledge the different nature of climate risks and impacts between EU members states and their regions.
[3] This information is then fed into national submissions to the European Environment Agency (EEA) and the European Commission. The regulation should be revised in 2026 to ensure an adequate response to the increasing impacts from climate change and other crises while fostering and supporting regional cooperation.

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The indicators and dashboards developed as part of the VALORADA project can directly serve as a basis for local governments in Přerov and Mladá Boleslav in developing their strategies for climate change adaptation and mitigation, as well as for measures in the areas of spatial and strategic planning. They can also serve as a foundation for the creation of regional planning documents and benefit other entities, such as water management companies, transportation companies, organizations managing municipal property, and other municipal organizations. Finally, as an indirect consequence, they can contribute to sustainable economic development and a healthier environment for citizens.

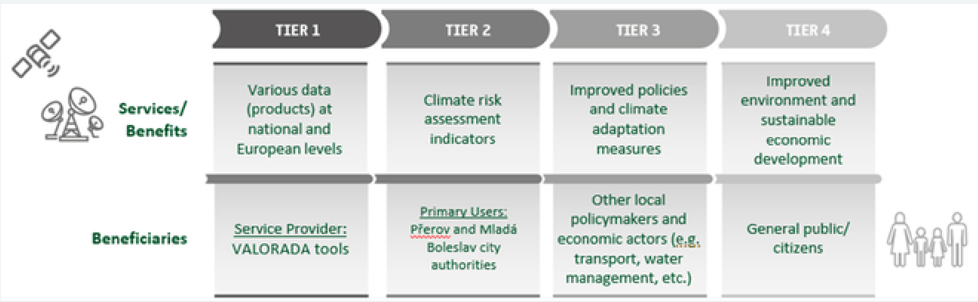

Figure 3 Value chain of the use case

What are the benefits?

Using the VALORADA tools generates a wide range of scientific, regulatory, societal, economic and environmental benefits, strengthening the capacity for climate adaptation across the Přerov and Mladá Boleslav areas. By combining validated EO inputs with climate data and information, stakeholder-driven indicators and accessible dashboards, the tools improve the availability and usability of climate risk information. This supports more informed decision-making, more efficient governance processes and more resilient regional development. The following are some of the key benefits:

Regulatory

- Evidence-based policymaking enabled by VALORADA supports the design of regional adaptation measures aligned with EU and national strategies (tier 2)
- Harmonised stakeholder-driven indicators enable continuous assessment of climate risks and progress toward adaptation targets (tier 2)
- Public dashboards and visual tools improve stakeholder awareness of local hazards (tier 2, 4)
- Enables assessment of the effectiveness of adaptation actions over time (tier 2)
- Objective EO-based evidence supports transparency in public climate decision-making (tier 2)
- Faster, more coherent cross-department decision-making through a shared, traceable indicator set (tier 2 and 3)
- Stronger monitoring and reporting capacity through repeatable methods and documented metadata (tier 2 and 3)

Economic

- Avoided costs for developing new local data infrastructures thanks to access to Copernicus and VALORADA data services (tier 2)
- Reduced time and cost for gathering, harmonising and validating climate data due to integration through the VALORADA dashboard (tier 2)
- Faster access to validated risk indicators enables more effective updates to adaptation strategies and policy decisions at both the national and regional levels (tier 2)

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Societal

- Available information on risks supports climate awareness and proactive behavior (tier 4)
- A shared geospatial operational overview enhances coordination among departments within local governments, between agencies in different cities, and, for example, between city transportation companies, emergency response agencies, and others (tier 2).

Environmental

- Better prioritisation of green-infrastructure actions by showing where cooling and retention gains are likely to be highest.
- More proactive maintenance by tracking vegetation condition and drought stress and identifying where ecosystem services may degrade.

Innovative/entrepreunarial

- New workflows for integrating EO data into planning processes and monitoring systems (tier 2)

Scientific

- The CIC methodology developed as part of the VALORADA project can be further developed within the framework of research projects, in collaboration with universities (tier 1 and 4)

Concrete examples already visible in the dashboards include flood-exposure screening (people, properties and critical infrastructures within flood-prone zones) and green-space service metrics (green area per capita and accessibility to public green spaces). Together, they support the prioritisation of nature-based solutions and targeted retrofit measures.
These benefits align with SDG 13 (Climate Action), particularly Target 13.2 (integrating climate measures into planning) and Target 13.3 (improving awareness and institutional capacity for adaptation and early warning).

Extended impact

The Czechia demonstrator provides a replicable blueprint for other European cities facing combined heat–drought–intense rainfall pressures. The approach can be transferred by reusing the shared Copernicus-based indicator backbone and CIC logic, while substituting local municipal datasets (green inventories, asset registers, flood-risk layers and vulnerability profiles). At European level, the work demonstrates how local datasets become more valuable for adaptation when linked to standardised EO and climate indicators through transparent metadata and governance practices. Datasets and indicator outputs are described with standardised metadata and published through an INSPIRE/FAIR-aligned catalogue, supporting re-use, comparability and long-term sustainability.
A clear roadmap for scaling is already embedded in the indicator registry: several heat-vulnerability and Landia-derived composite indicators remain 'not started' because they require additional socio-economic inputs and harmonised vegetation classes. Making these inputs available would allow the cities to extend from hazard and exposure screening to deeper vulnerability analysis and more targeted heat-health action planning.
From an exploitation perspective, VALORADA distinguishes between open, royalty-free outputs (indicator definitions, metadata and guidance material) and components that may be operationalised by service providers under agreed licences. This enables municipalities to adopt the public-good elements immediately while keeping a pathway for sustained service provision after the project.

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The Ministry of the Environment of the Czech Republic has submitted an application for a ten-year LIFE ADAPT-CZ project, which, among other things, envisages updating the Czech national adaptation strategy. As part of this project, in which ASITIS is also involved, there are plans to integrate the outputs of VALORADA, specifically further progress in the evidence-based approach and the use of data catalogues, indicators, and selected other elements of the VALORADA results.

ASITIS' selection in SPACE4Cities during Phase 1 and 2 built upon VALORADA's climate impact chain methodology and plans to develop further activities related to the climate impact chain methodology as part of the development of an application to strengthen the resilience of cities to climate change, which uses innovative space technologies and the CIC methodology to analyse and model the cascading effects of climate phenomena in urban environments.

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