

Remote and In Situ Environmental Surveillance of Urban Streams to support Public Health Issues

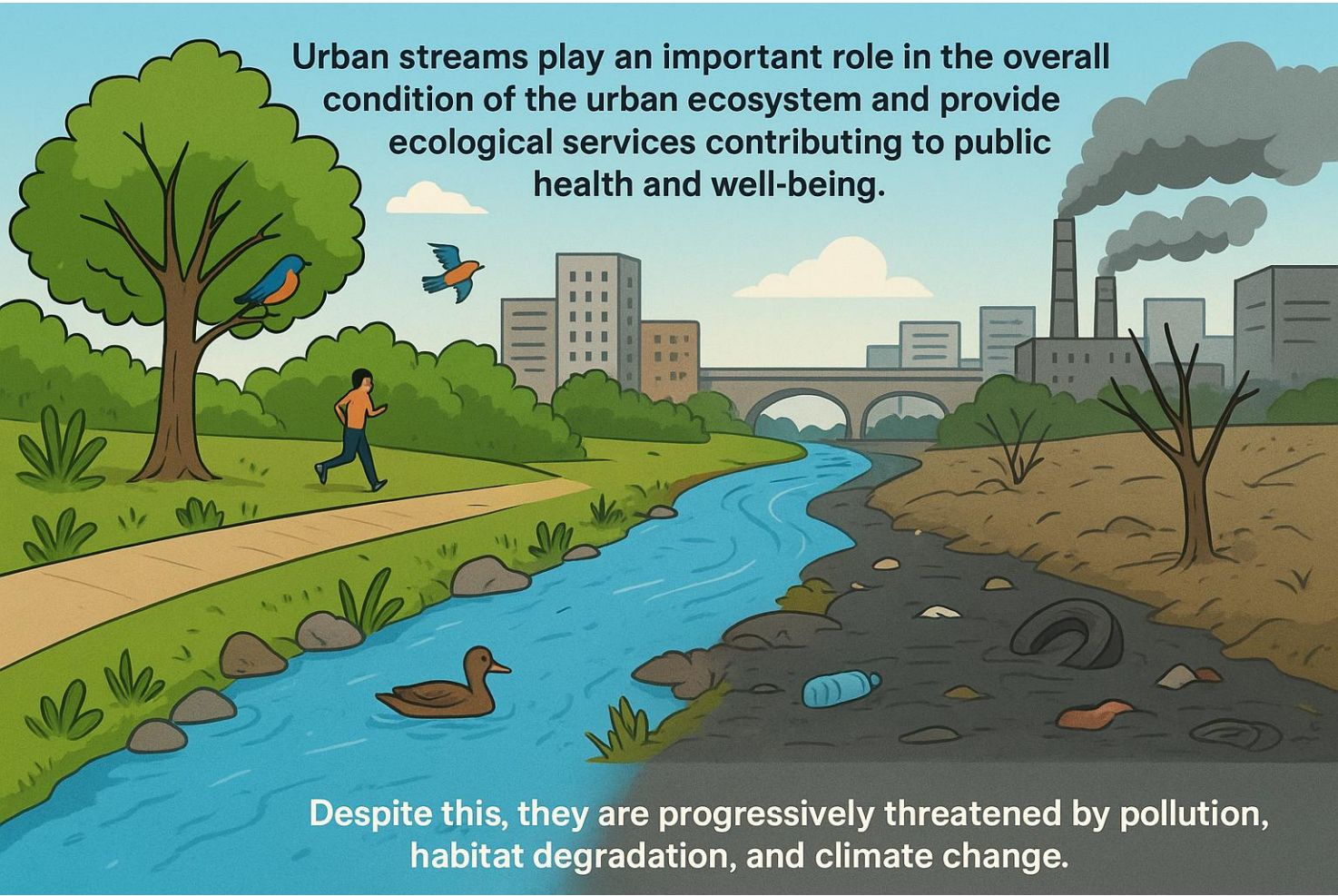
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Why healthy streams in general?..

- Provide clean water for drinking, agriculture, recreation, and industry
- Help filter pollutants from storm water and anthropogenic activities that flow into the stream
- Provide habitat for wildlife
- Invite fishing, kayaking, exploration, or just quiet listening as the water flows...

Urban Streams Matter



Urban streams play an important role in the overall condition of the urban ecosystem and provide ecological services contributing to public health and well-being.

Despite this, they are progressively threatened by pollution, habitat degradation, and climate change.

- Urban streams = lifelines for ecosystems & communities
- Provide biodiversity habitats, clean water regulation, climate resilience, public health & well-being
- Threats: pollution, habitat loss, climate change → waterborne diseases, antimicrobial resistance, chemical exposure

Problem Statement

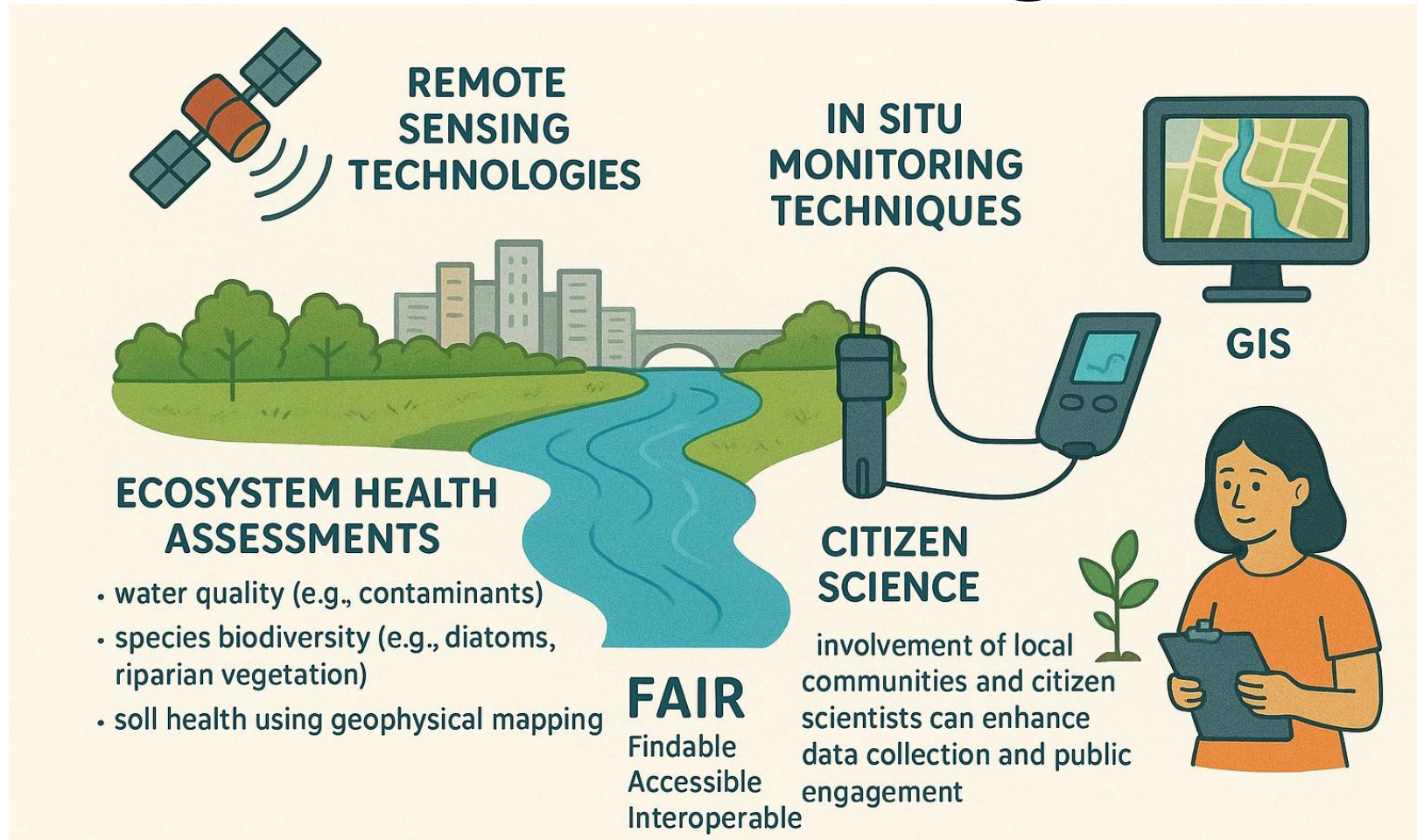
Fragmented &
inconsistent monitoring
methods

Limited integration of
environmental and
health data

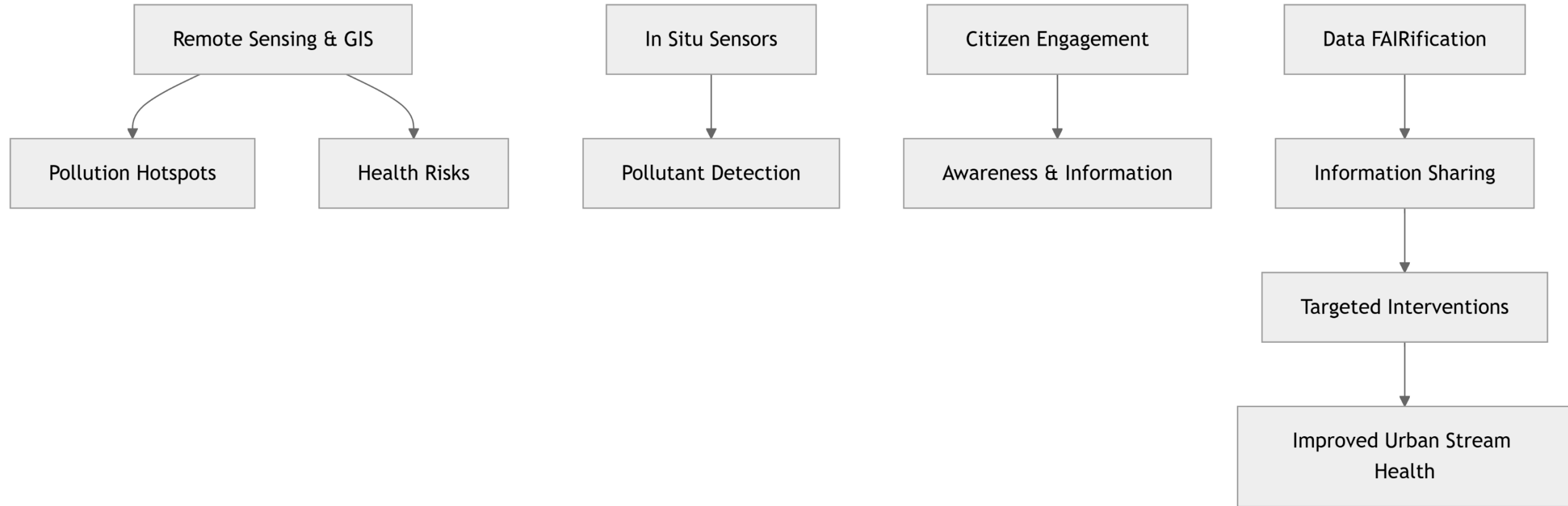
Weak public
engagement and data
accessibility

Need for scalable,
interdisciplinary
surveillance to inform
timely interventions &
policy

Detailed framework of urban stream monitoring



Why this methodological Workflow?

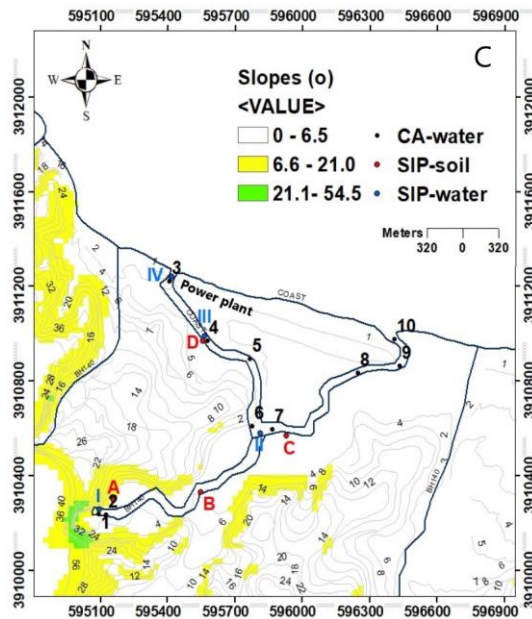
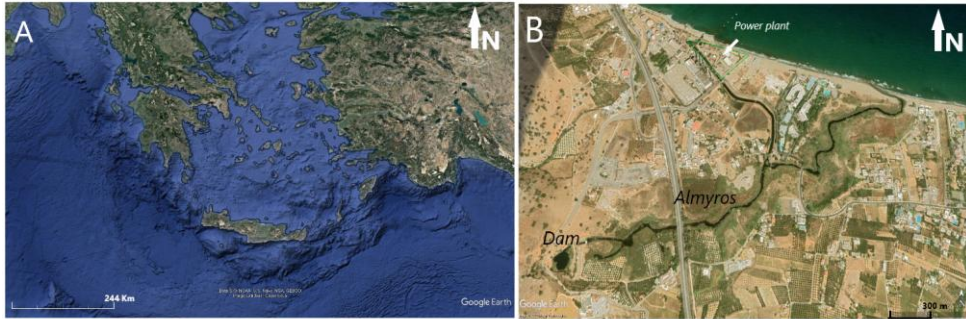


Case Example: OneAquaHealth

- Application in EU cities: mapping pollution + citizen reporting
- Integration of environmental & health indicators
- Supporting targeted restoration & policy response



The case of Almyros River (Heraklion, Crete, Greece)



Potential sources of pollution in the fragile karst ecosystem of Almyros

- Public and private infrastructure (transport networks, power plant and power lines, desalination plants, factories, hotels, etc.)
- Agricultural activities
- Livestock
- Domestic waste disposal
- Inert material dropping

Key Messages

- Monitoring urban streams links environmental degradation & public health risks.
- Combining remote sensing, in situ monitoring & GIS enables effective surveillance.
- FAIR data ensures transparency & rapid interventions across disciplines.
- Resilient water systems support ecological integrity & public health.

Thank you for your time!

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References

1. Kokinou, E., Zacharioudaki, D., Kokolakis, S. *et al.*, 2023. Spatiotemporal environmental monitoring of the karst-related Almyros Wetland (Heraklion, Crete, Greece, Eastern Mediterranean). *Environ Monit Assess* 195, 955 (2023).
<https://doi.org/10.1007/s10661-023-11571-5>
 2. Kokolakis, S.; Kokinou, E.; Karagiannidou, M.; Gerarchakis, N.; Vasilakos, C.; Kotti, M.; Chronaki, C. From Space to Stream: Combining Remote Sensing and In Situ Techniques for Comprehensive Stream Health Assessment. *Remote Sens.* 2025, 17, 1532. <https://doi.org/10.3390/rs17091532>
- OneAquaHelath, Newsletter #1, <https://preview.mailerlite.io/preview/335497/emails/123479239644153849>.