

ISPRS Technical Commission IV

Spatial Information Science

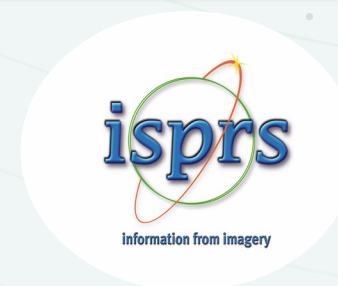
2026-2030

Advancing Spatial Information Science through
Collaboration, Innovation and Impact

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2026-2030

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Key priorities for TC IV

A coherent scientific agenda connecting data, methods, systems and societal applications

priority logic

**connect
foundational
research with
operational and
societal needs**

Data & semantics

- semantic models
- knowledge graphs
- interoperability
- spatial databases

GeoAI & analytics

- foundation models
- spatial inference
- uncertainty
- real-time intelligence

Systems & services

- digital twins
- visual analytics
- APIs, platforms and geospatial services
- agentic GIS and geospatial AI agents
- governance

People & impact

- mobility
- human behaviour
- SDGs and resilience
- policy support

Terms of Reference of TC IV

- Develop and promote spatial information science methods for modelling, managing, analysing, visualizing, sharing and governing multi-dimensional geospatial information.
- Advance semantic spatial data models, ontologies, knowledge graphs, linked and federated data, metadata, provenance, data quality and uncertainty modelling towards interoperable multi-source geospatial data integration.
- Strengthen geospatial AI, spatial analytics and computational methods, including Geospatial Foundation Models, GeoLLMs, representation learning, generative and explainable AI, towards spatial inference, forecasting and decision support.

Terms of Reference of TC IV

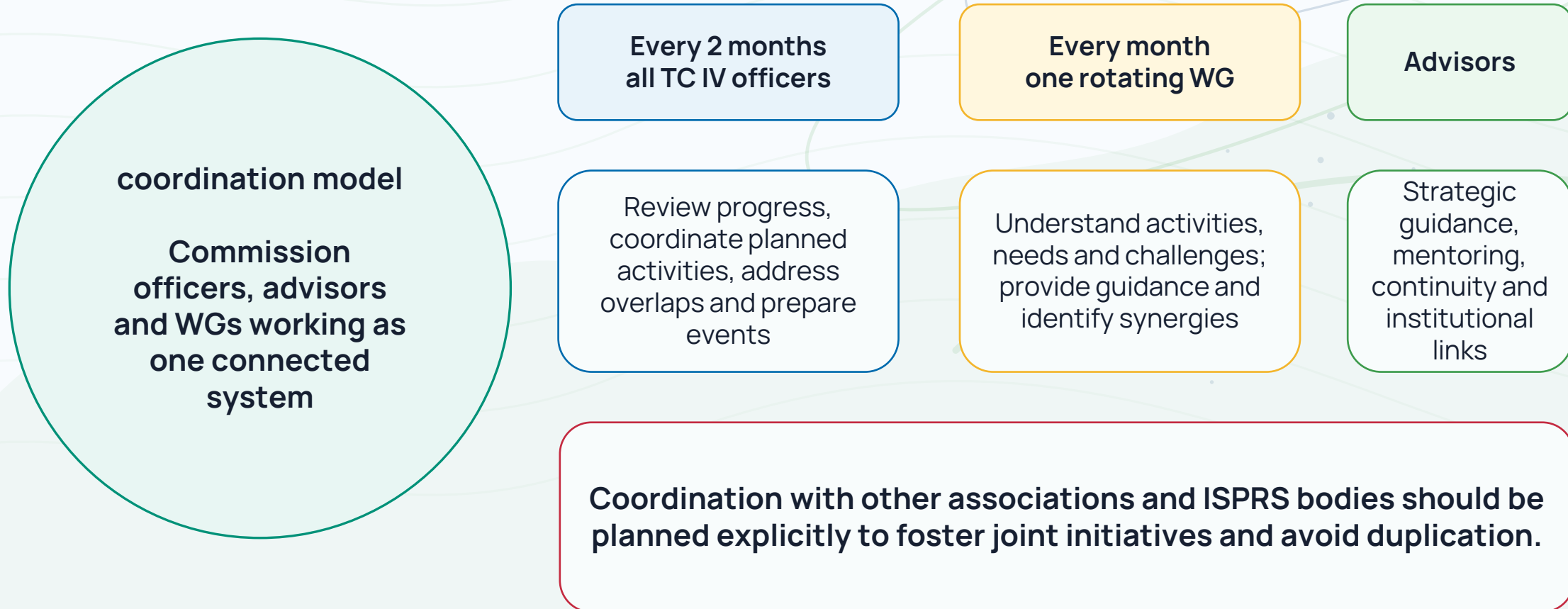
- Promote computational methods for change detection, anomaly detection, simulation and optimisation towards scalable analysis of dynamic space-time processes.
- Advance hybrid cloud-edge-HPC computing towards efficient, reliable and operational geospatial data processing and analytics.
- Support trusted geospatial services and operational platforms based on open standards, APIs, SaaS, cloud-edge and distributed infrastructures, service composition, open-source ecosystems, agentic GIS, geospatial AI agents and responsible automation.

Terms of Reference of TC IV

- Foster human-centred, visual and immersive approaches to spatial information, including visual analytics, XR, VR and AR environments, natural-language and conversational interfaces, multi-user collaboration, usability, accessibility and human behaviour in space.
- Promote application-driven spatial information science, including global mapping and big geospatial data analytics, for digital twins, smart cities and regions, sustainable development, climate action, disaster risk reduction, environmental monitoring, cultural heritage, healthy communities and policy support, with particular attention to supporting the UN Sustainable Development Goals.
- Strengthen international cooperation, capacity building, open science, ethics, privacy, transparency, responsible AI and digital sovereignty in spatial information science.

Governance and coordination

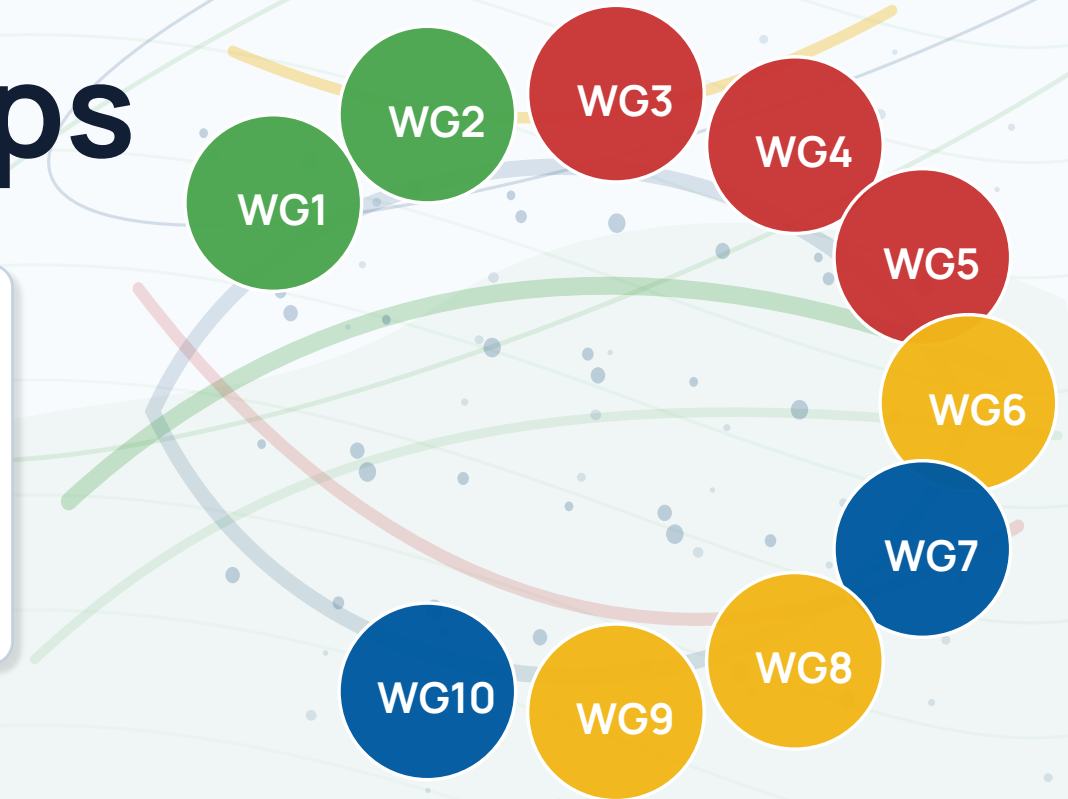
Regular coordination mechanisms to support continuity, alignment and joint action



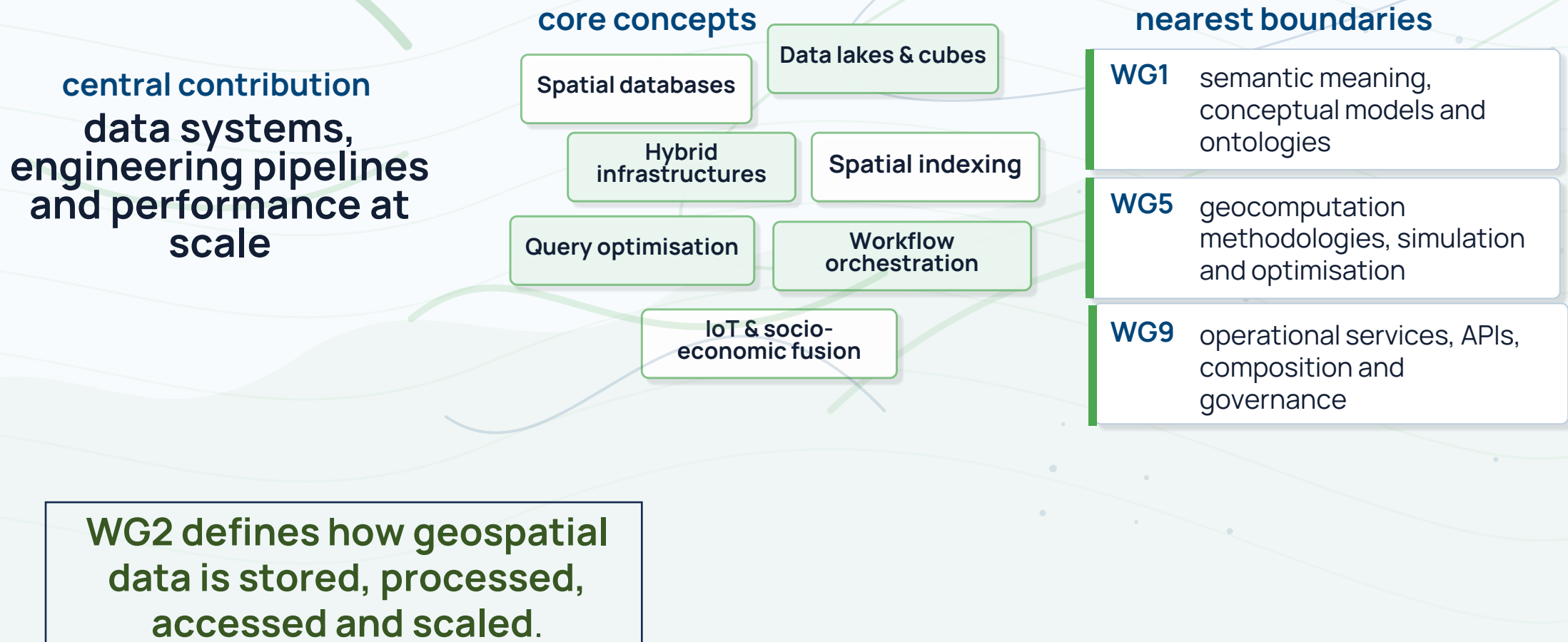
TC IV Working Groups

Purpose

Clarify where each WG leads, where it connects, and how authors can route contributions.

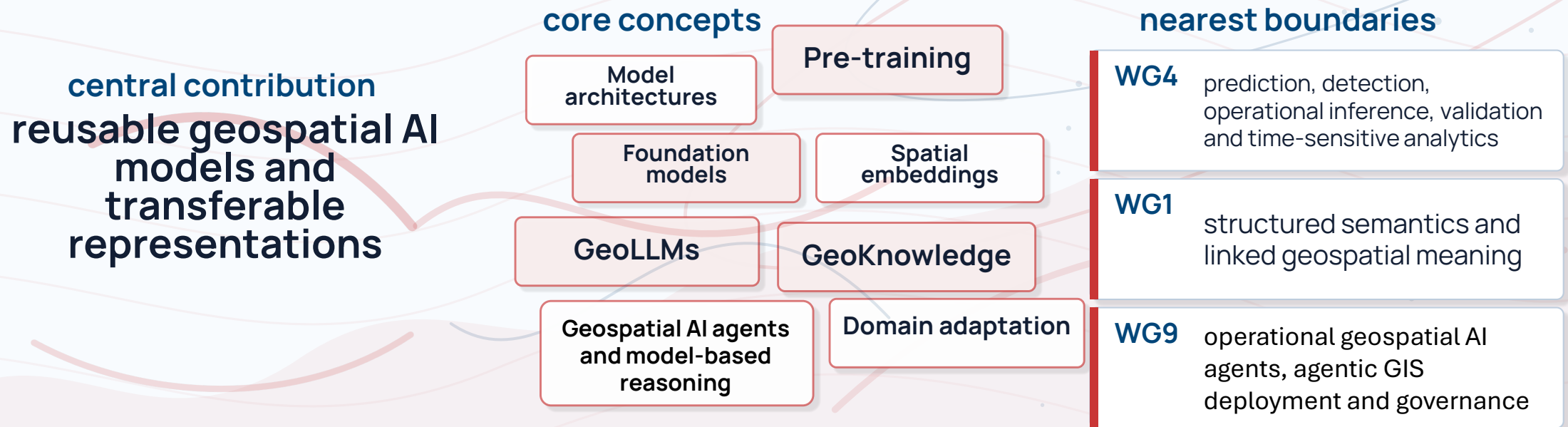


2. Spatial Data Engineering, Databases and Scalable Data Infrastructures



WG3

3. Geospatial AI Models and Representation Learning

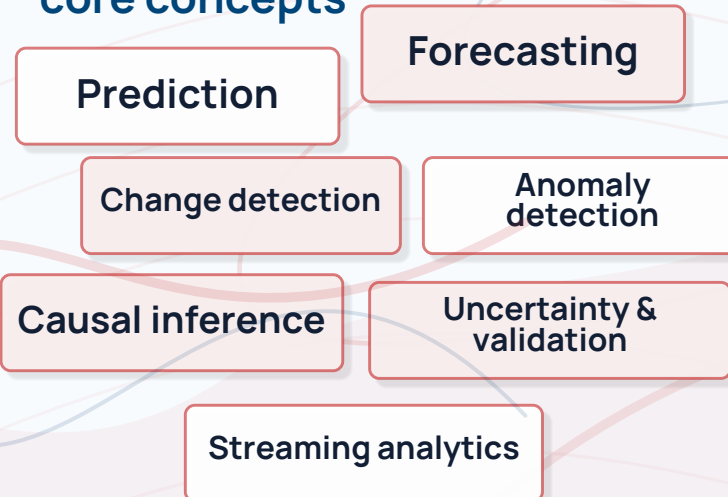


WG3 builds reusable model capacity before specific analytic use

WG4 4. Spatial Analytics, Inference, Uncertainty and Time-Sensitive Intelligence

central contribution
**analytical use of
models to answer
spatial questions**

core concepts



nearest boundaries

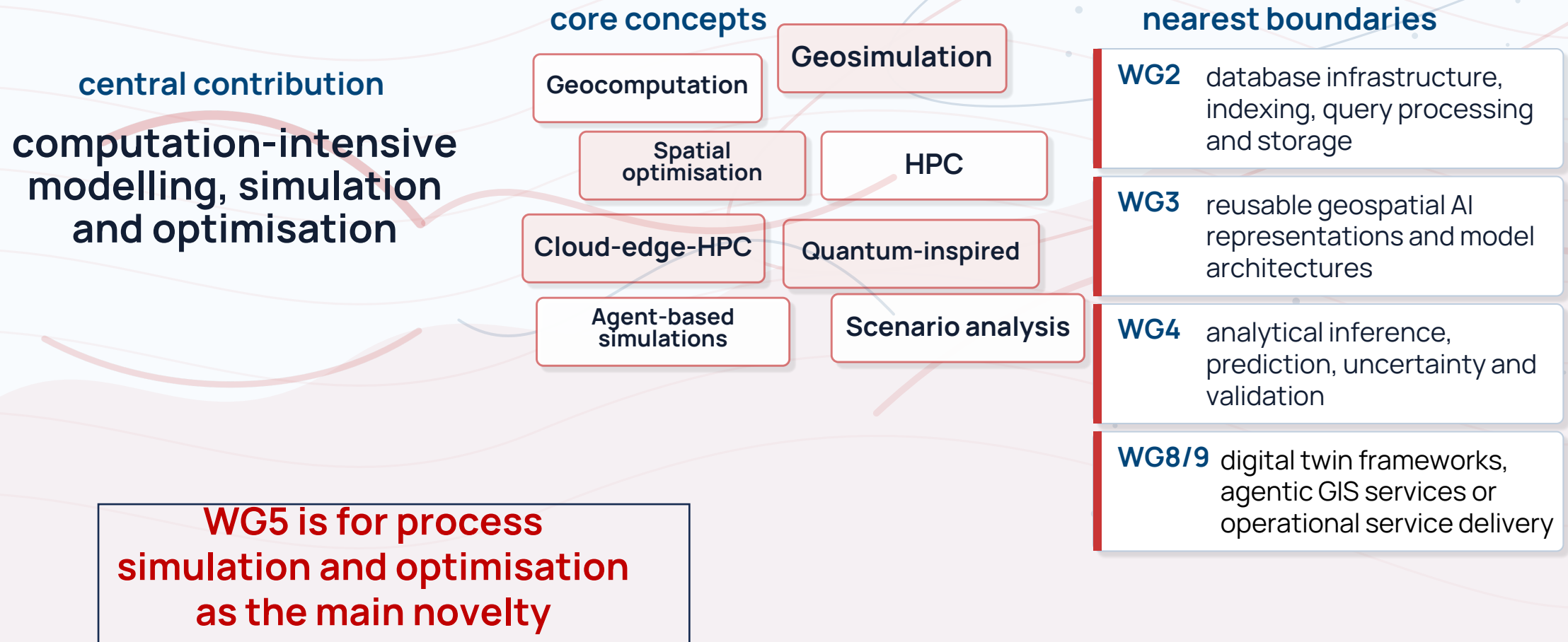
WG3 reusable geospatial AI
model creation and pre-
training

WG5 simulation, optimisation and
high-performance
computational frameworks

WG7-10 real-time applications and
deployments by domain
focus

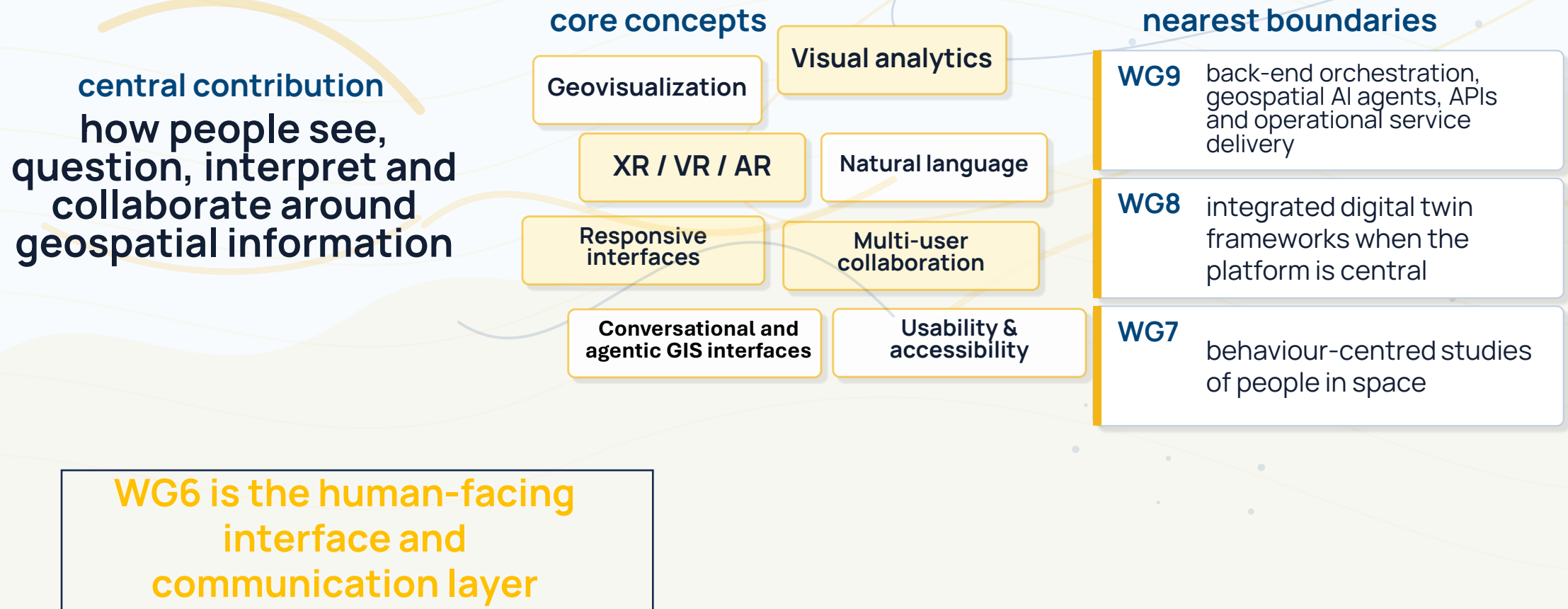
**WG4 uses methods to
infer, explain, detect and
validate**

5. Geocomputation, Geosimulation and Hybrid Computing



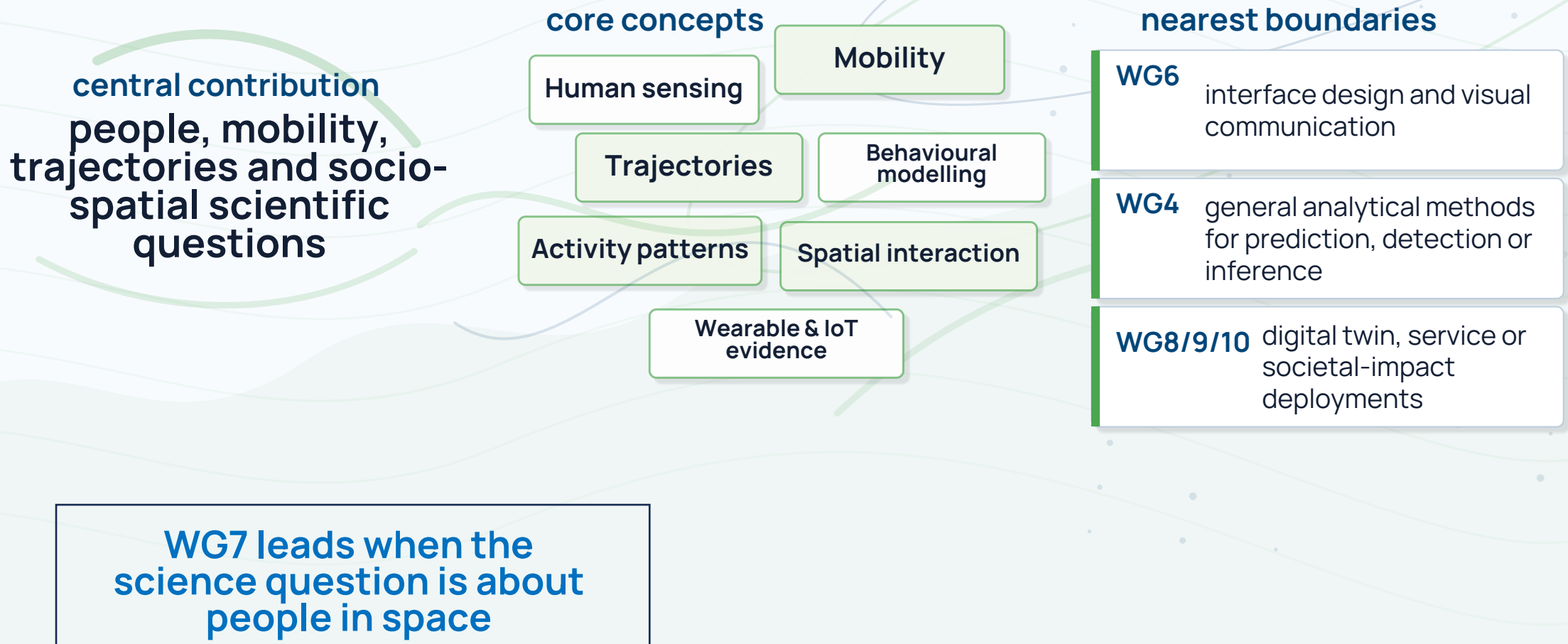
WG6

6. Visual Analytics, Immersive Environments and Natural-Language Interaction



WG7

7. Human Behaviour, Mobility and Socio-Spatial Dynamics

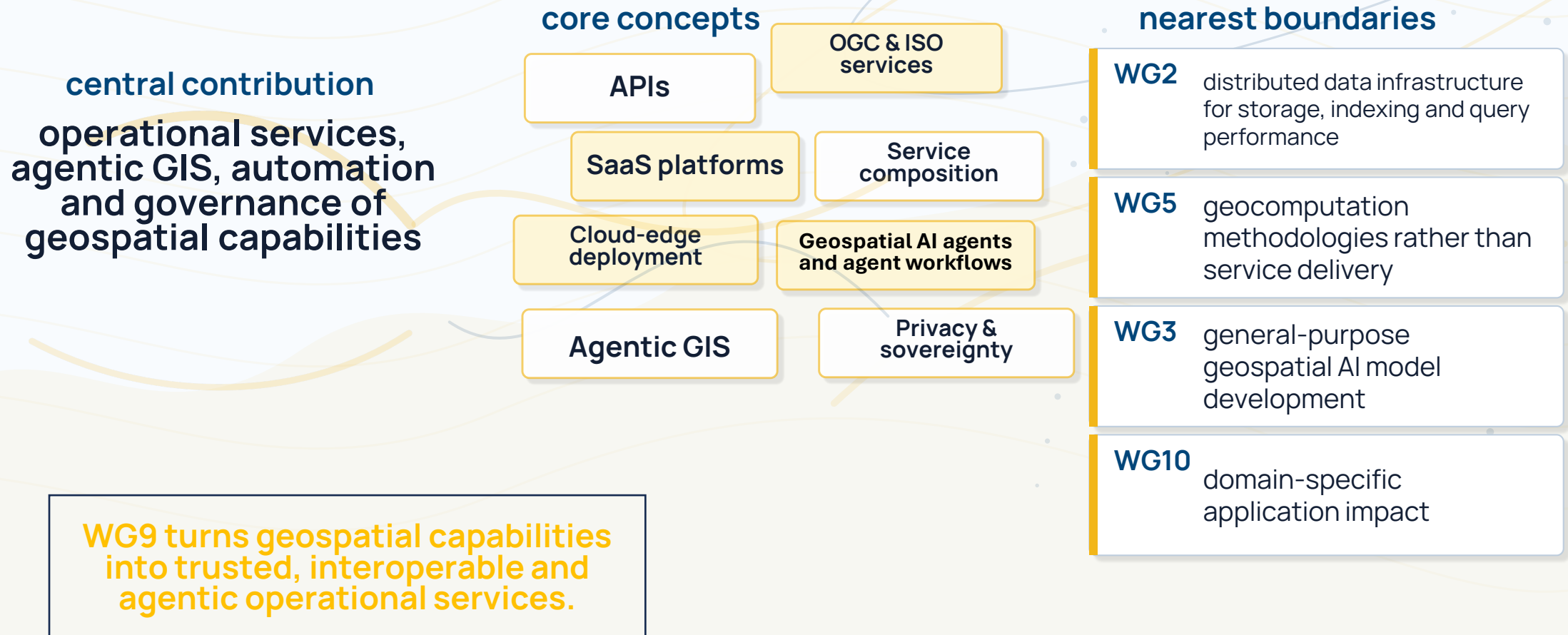


8. Spatial Digital Twins for Buildings, Cities and Regions



WG8 leads when the integrated digital twin framework is central.

9. Geospatial Services, Agentic GIS, Governance and Digital Sovereignty

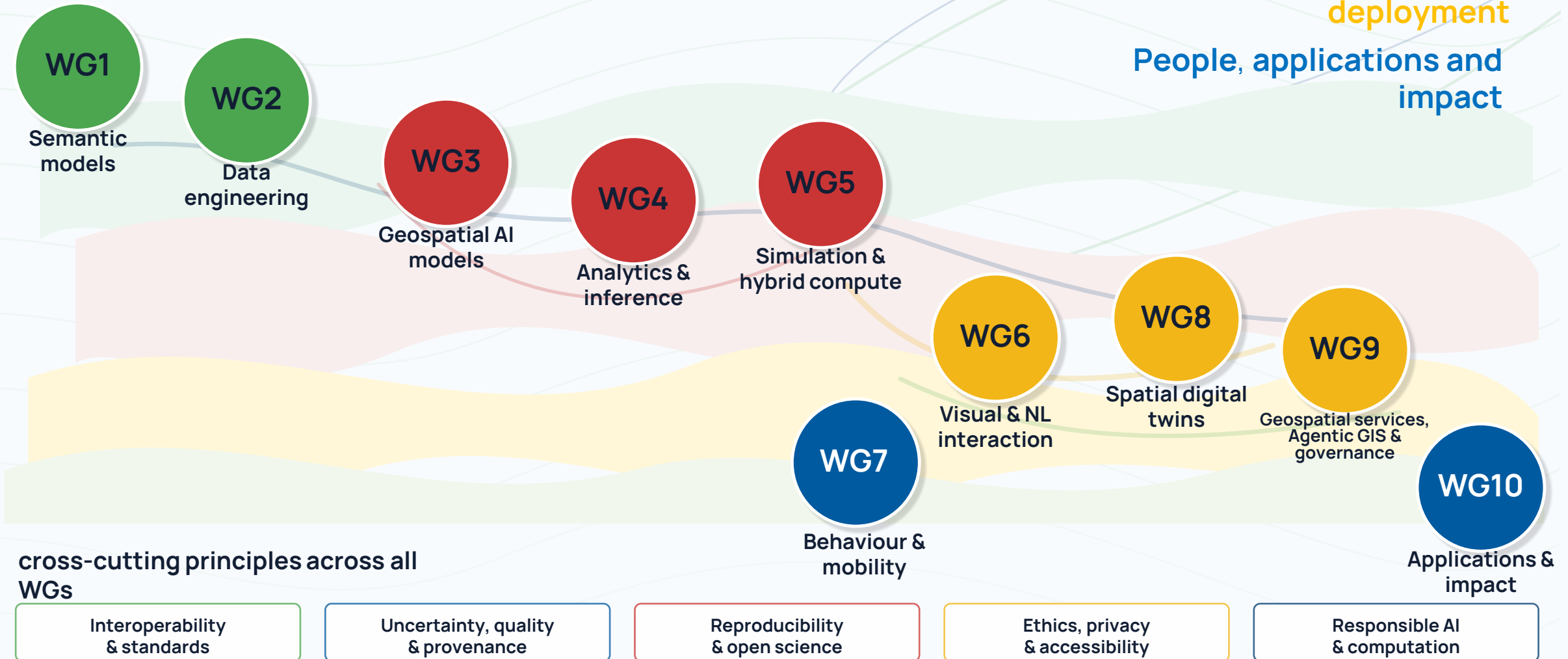


WG10

10. Application-Driven Spatial Information Science for Societal and Environmental Challenges



All WGs - concept landscape
and referral boundaries



ICWG IV/III - Global Geospatial Data and Intelligence for SDGs

**ICWG IV/III/II/I/V - Open Geomatics Science for Digital Commons
and Capacity Building**

**ICWG I/IV - Embodied Sensor Systems for Mapping and Spatial
Intelligence**