



Institute for Geospatial Understanding through an Integrative Discovery Environment (I-GUIDE)



Mission

Transform geospatial data-intensive sciences through integration of AI and cyberGIS, reproducible data-intensive analytics and modeling, FAIR (Findable, Accessible, Interoperable, and Reusable) data principles, and innovative education and workforce development programs

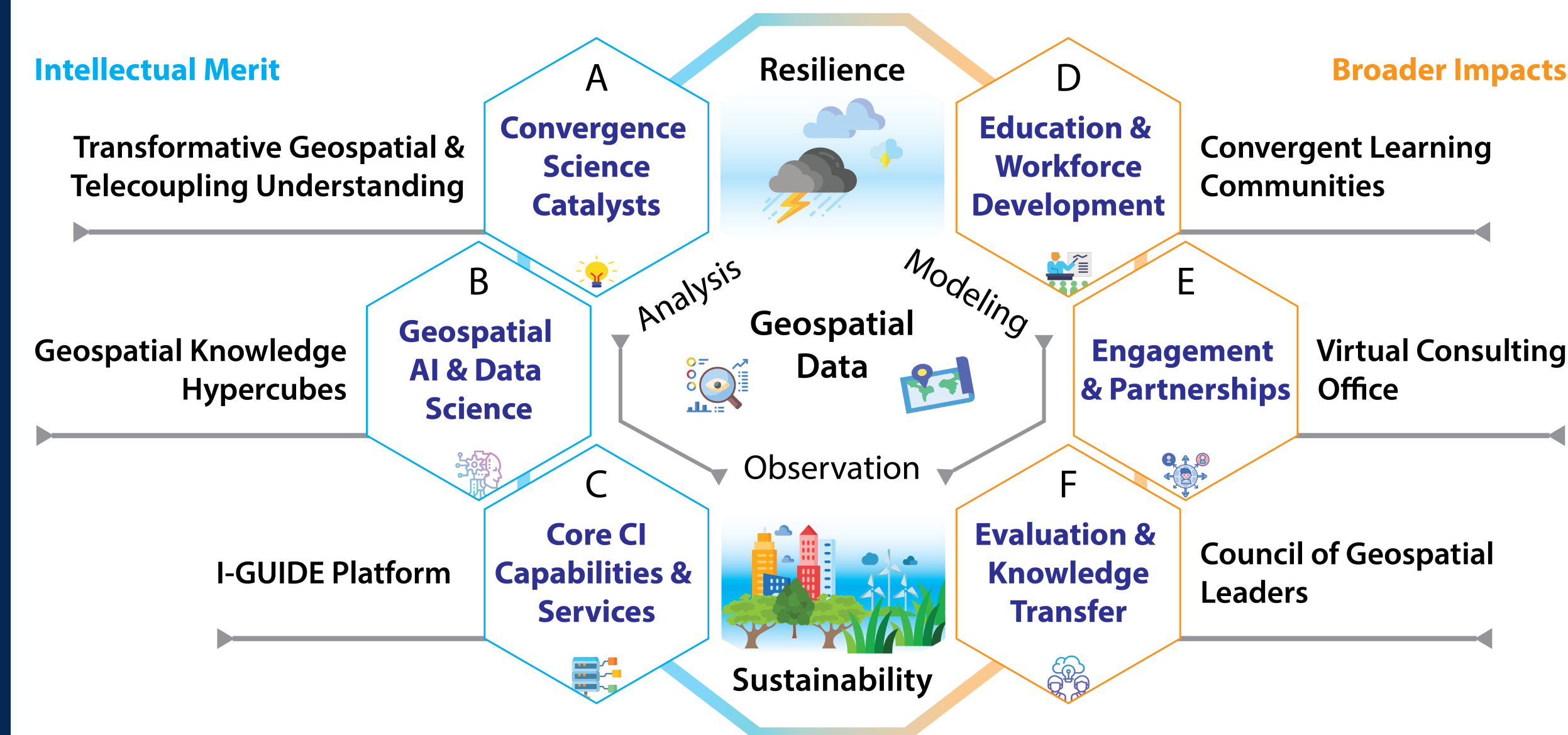
Vision

Establish a novel, integrative geospatial discovery environment for empowering diverse communities to produce data-intensive solutions to society's resilience and sustainability challenges

Focus Areas



Major Outcomes



Collaborating Institutions

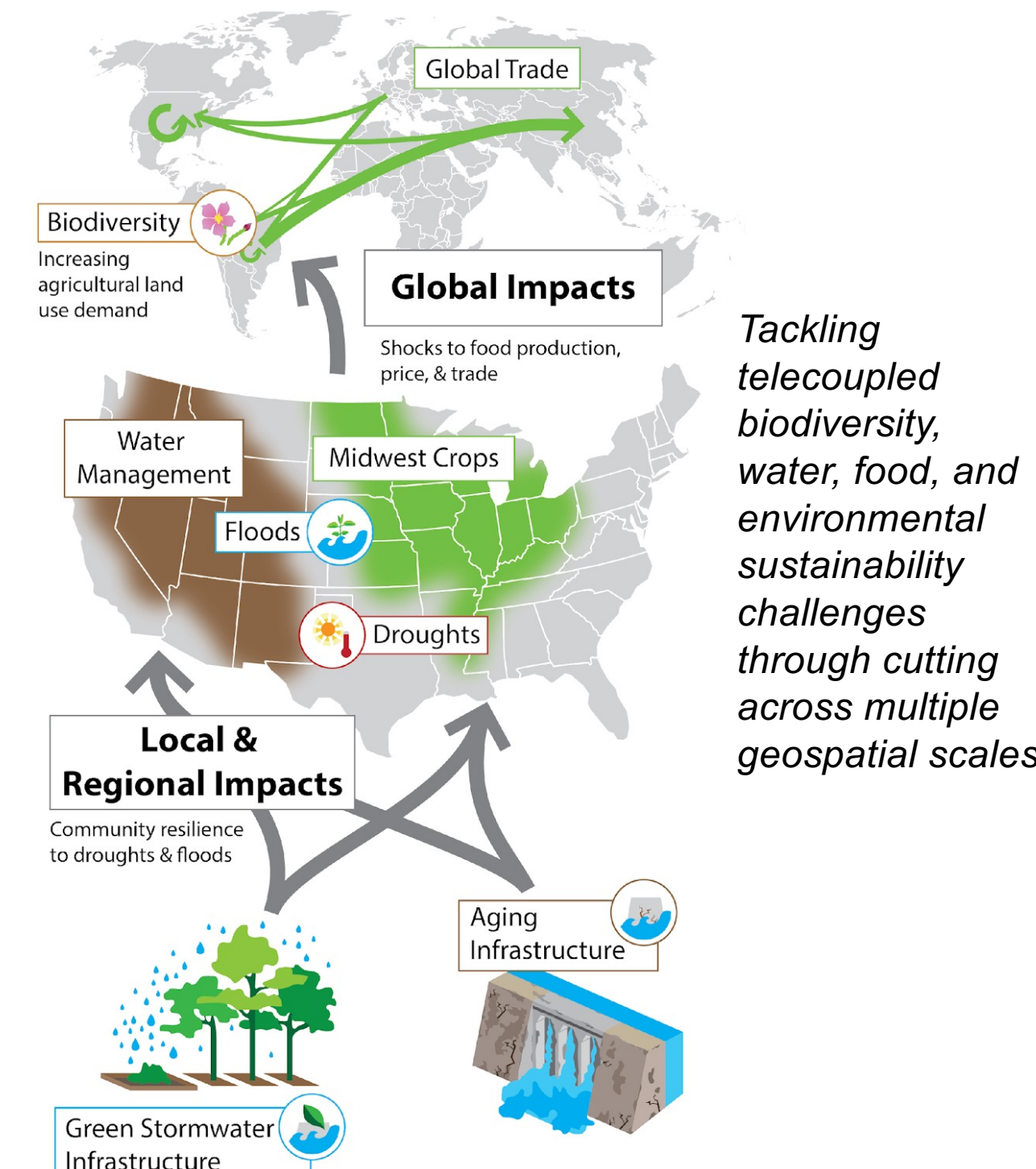


Convergence Science Catalysts

Objective: Create the knowledge needed to solve complex problems of resilience and sustainability in a multi-scale and telecoupled context through geospatial data-intensive and multi-type (AI, theory-based, and mechanistic) analysis and modeling

Major Tasks

Understand	Assess
C1-1: Understand cross-scale vulnerability to hydroclimate extremes	C1-2: Assess sustainability of water management infrastructure
Understand	Evaluate
C2-1: Understand impacts of global changes on land use and food security	C2-2: Evaluate telecoupling of biodiversity, distant disasters, land use, and food trade

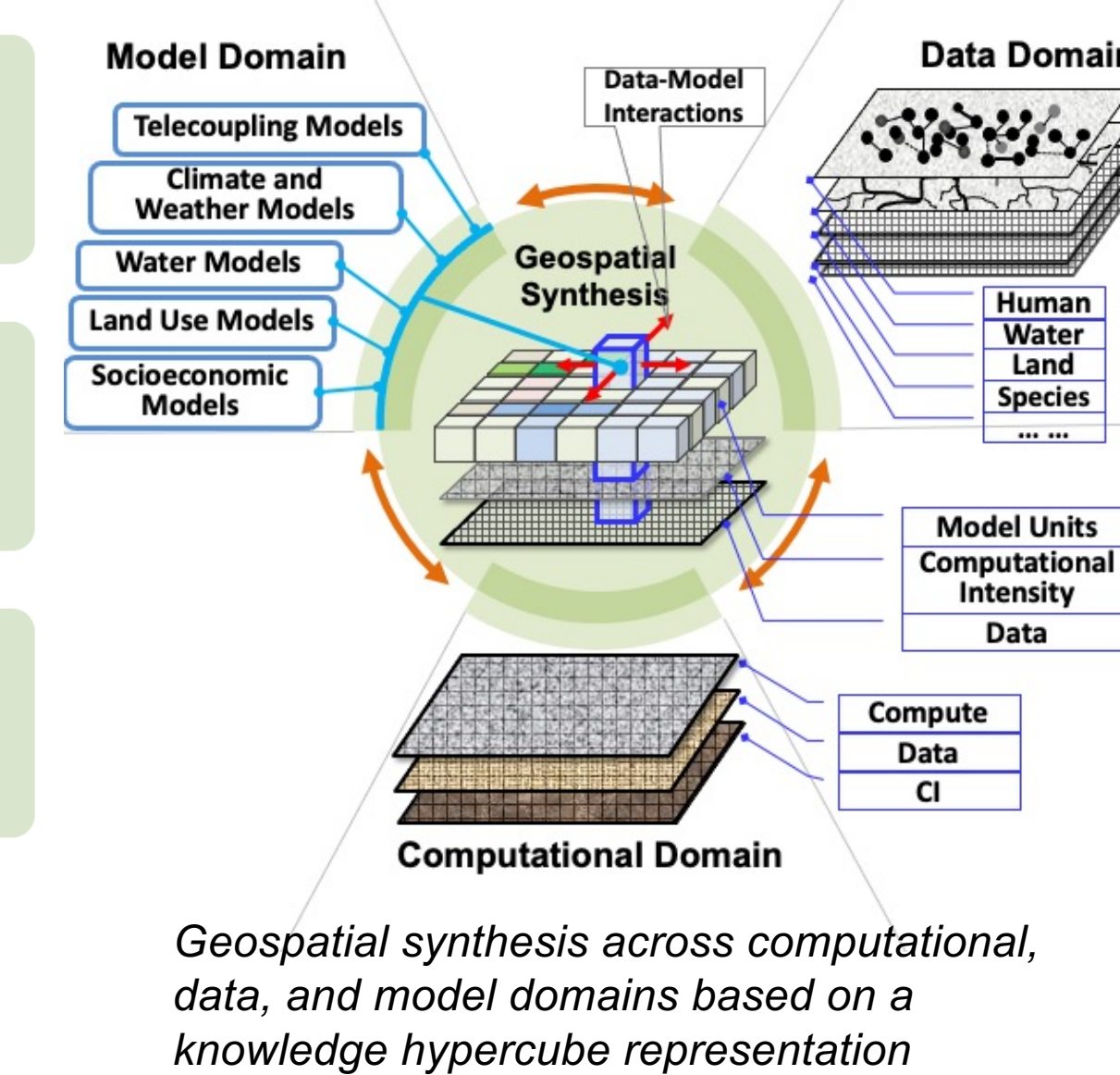


Geospatial AI & Data Science

Objective: Advance geospatial AI and data science frontiers to enable convergence research and education through innovation of geospatial knowledge hypercubes

Major Tasks

- AI-1: Advance geospatial AI and data science foundations
- AI-2: Innovate geospatial knowledge hypercubes
- AI-3: Develop structural guidance for computational reproducibility and data ethics

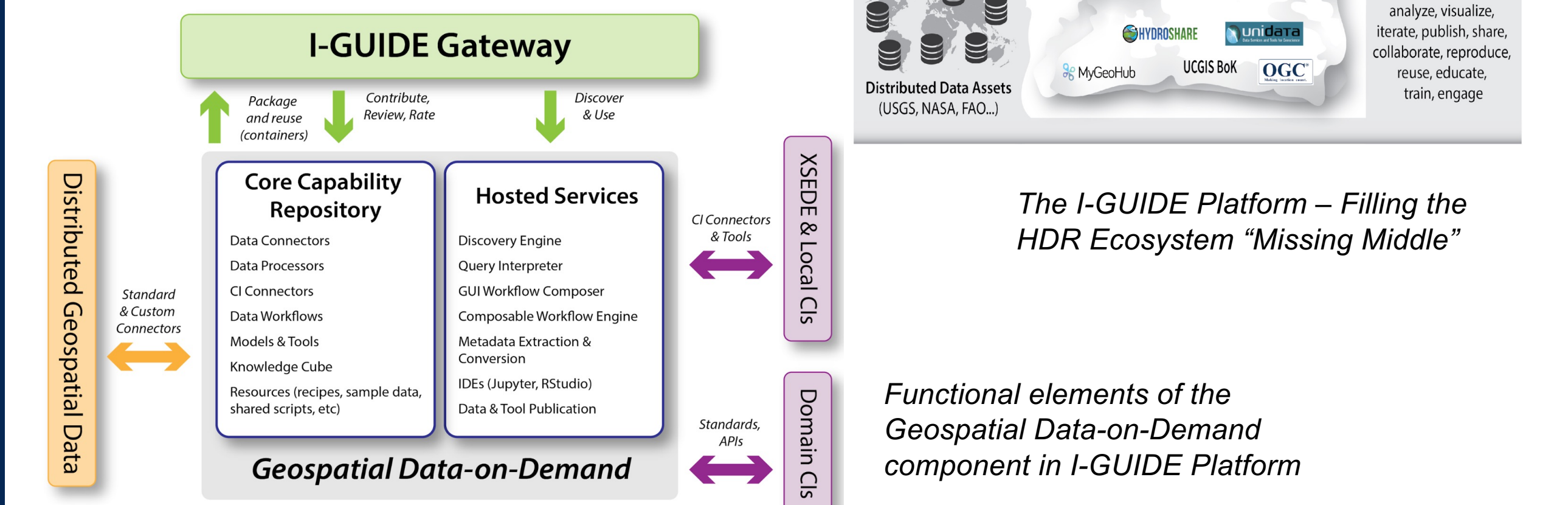


Core Cyberinfrastructure Capabilities & Services

Objective: Integrate distributed geospatial data capabilities and advanced CI to form a composable and open I-GUIDE Platform to accelerate scientific workflows and support education and workforce development as well as broader community engagement

Major Tasks

- CI-1: Geospatial Data-on-Demand for seamless data access and analysis
- CI-2: Interoperation between models and data
- CI-3: Enable, facilitate and support education and workforce development
- CI-4: Integrate and interoperate with existing CIs
- CI-5: Establish consulting and support services



Education & Workforce Development

Objective: Create convergent learning resources and programs to promote knowledge and skill acquisition and build geospatial data science competencies for diverse learners

Major Tasks

- Edu-1: Understand, learn from, and forge connections with communities of practice
- Edu-2: Design connections to the I-GUIDE platform to support research-linked learning pathways
- Edu-3: Innovative instructional and training activities for convergence science education

Engagement & Partnerships

Objective: Sustain a multi-faceted, ongoing engagement campaign consisting of a virtual consulting office, a partnership program, and a science communication program

Major Tasks

Establish	EP-1: Establish a virtual consulting office
Engage	EP-2: Engage external organizations through a partnership program
Develop	EP-3: Develop collaborative science communication space

Evaluation & Knowledge Transfer

Objective: Evaluate and optimize I-GUIDE through bi-directional knowledge transfer to industry and public sector stakeholders by leveraging partnerships to assess both transfer mechanisms and the degree to which I-GUIDE's outcomes align with real-world needs

Major Tasks

- EKT-1: I-GUIDE internship program: students as bidirectional knowledge transfer agents
- EKT-2: I-GUIDE Council of Geospatial Leaders (CGL): private and public sector evaluation and optimizing of workforce training
- EKT-3: Evaluation and coordination of knowledge production and its transfer across I-GUIDE