

# CIG Strategic Objectives

*Revised May 2020*

## **Strategic Objective 1a: Community Leadership: Infrastructure**

Promote and advance the CIG scientific community through the use of modern computational methods, good data and software governance, to increase the visibility of its mission and science.

### **Actions**

- Promote credit for software development and data such as standards for citation in peer-reviewed journals, recognition in code communities, and other dissemination platforms.
- Engage in developing guidelines to meet FAIR for data and software.
- Advocate nationally for programs and infrastructure addressing community needs for computationally based science. Showcase CIG-enabled research internationally, possibly in coordination with related national organizations.
- Promote organizing of CIG-related science sessions at major meetings.

## **Strategic Objective 1b: Community Leadership: Broadening Diversity**

Foster and advance the CIG scientific community through the creation of inclusive communities at the crossroads of people, science, and technologies through the sustainment of collaboration across communities, nationally and internationally.

### **Actions**

- Regularly review membership and leadership in all programs for balance, diversity, and new opportunities.
- Provide forums to address multidisciplinary scientific and computational challenges requiring broad community participation.
- Create and sustain opportunities for collaboration between geoscientists and computational and mathematical scientists.
- Create opportunities for early career scientists to foster computational modeling.
- Seek greater opportunities to interact with diverse STEM communities to increase inclusivity.

## **Strategic Objective 2: Scientific Breadth**

Support integration and representation across related geoscience communities.

## Actions

- Engage related communities through collaborations and joint workshops.
- Seek collaborative science problems to actively engage with other communities, explore opportunities to address multidisciplinary challenges, and bring observational data into computational models.
- Explore connections with other institutions that can both leverage and expand capabilities.

## Strategic Objective 3: Infrastructure

Support the scientific community through planning, maintenance and capacity building supporting people, software and hardware as requested by the research community.

### Actions

#### Management & Governance

- Ensure management, governance, and operations meet community and sponsor needs.
- Plan for sustained software support, development and leadership.

#### Resource Acquisition

- Enable deployment of CIG codes on state-of-the art hardware, from desktop to leadership class computing and facilitate access to computing and HPC resources at all user levels.
- Promote and engage benchmarking exercises for both numerical accuracy and scientific efficiency with scalability in mind.
- Provide leadership in promoting numerical and algorithmic innovation for computational geosciences.
- Identify community needs and funding opportunities in cyber infrastructure.

#### Software Support

- Provide software infrastructure services to the community through dissemination, hosting and testing services.
- Support development of CIG community codes led by user-developers that leverage ideas and collaboration from active user communities.
- Provide guidance to software developers for code donations.
- Continue to engage in the broader community to improve and implement best practices.
- Improve accessibility and performance of existing codes as prioritized by the community, providing state-of-art software using modern techniques for computational geoscience through the deployment of modern technologies.

- Maintain forums to support software users and developers.

#### **Strategic Objective 4: Education and Outreach**

Build the capacity and diversity of the scientific community for numerical modeling in the geosciences and establish societal relevance through education and outreach activities.

##### **Actions**

- Build a broader developer and user community through training that builds progressively towards advanced levels.
- Promote education at all levels in computational modeling and HPC for the geosciences that cuts across domains.
- Develop and deliver educational materials and training to facilitate broader adoption of modern software engineering and best software development practices though-out the geodynamics modeling community.
- Provide a forum to share code experience both from the user and developer perspective.
- Create societal relevance by promoting geodynamics research that supports the public interest in natural hazards and climate change.

#### **Strategic Objective 5: Resources**

Diversify the resource base in support of the science community.

##### **Action**

- Cultivate new funding in support of the overall mission including federal, industry, private foundations, and international collaborations.

#### **Strategic Objective 6: High Performance Computing**

Facilitate access to High Performance Computing resources to meet the needs of the CIG community, from the mesoscale (mid-sized clusters) to leadership class computing.

##### **Actions**

- Facilitate access for the community to existing HPC resources such as XSEDE, Frontera, and INCITE.
- Cultivate new partnerships for access to HPC resources for community projects.
- Increase accessibility of software to resources.
- Work closely with computational and numerical experts to improve parallel performance.