EarthCube

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National Science Foundation

a joint venture between the Directorate for Geosciences and Office of Cyberinfrastructure

Big Questions, Big Problems

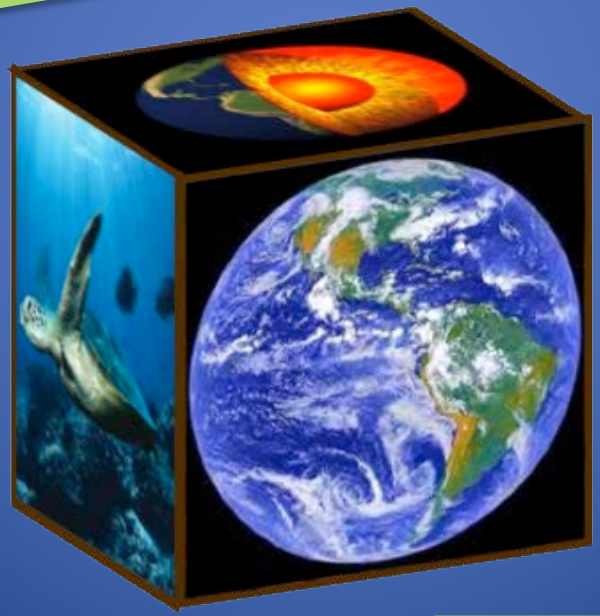
environmental change & resilience

formation & evolution of the atmosphere & oceans

human-earth interactions

the origin of life

climate change



deep – surface earth Interactions & feedbacks

extreme events – causes, periodicity, & implications

resource discovery & abundance

geohazards

life as a geologic agent

continental evolution & changes thru time

future world

Community: Cyber/Model Sophistication Index

Age of Enlightenment

Computer/Cyberinfrastructure Communities

The 15%

Modern Age

Atmospheric and Climate Modeling Communities

Industrial Age

Seismology/Earthquake and Physical Oceanography Communities

The 85%

Bronze Age

Nearly all other Geoscience groups

Present Relative State of Cyber-Sophistication and Knowledge in the Geosciences

Read It and Weep

The 15% spend an increasing amount of time having problems wrestling with unmanageably large data arrays, complex models, and problems scaling from global to regional or local scales

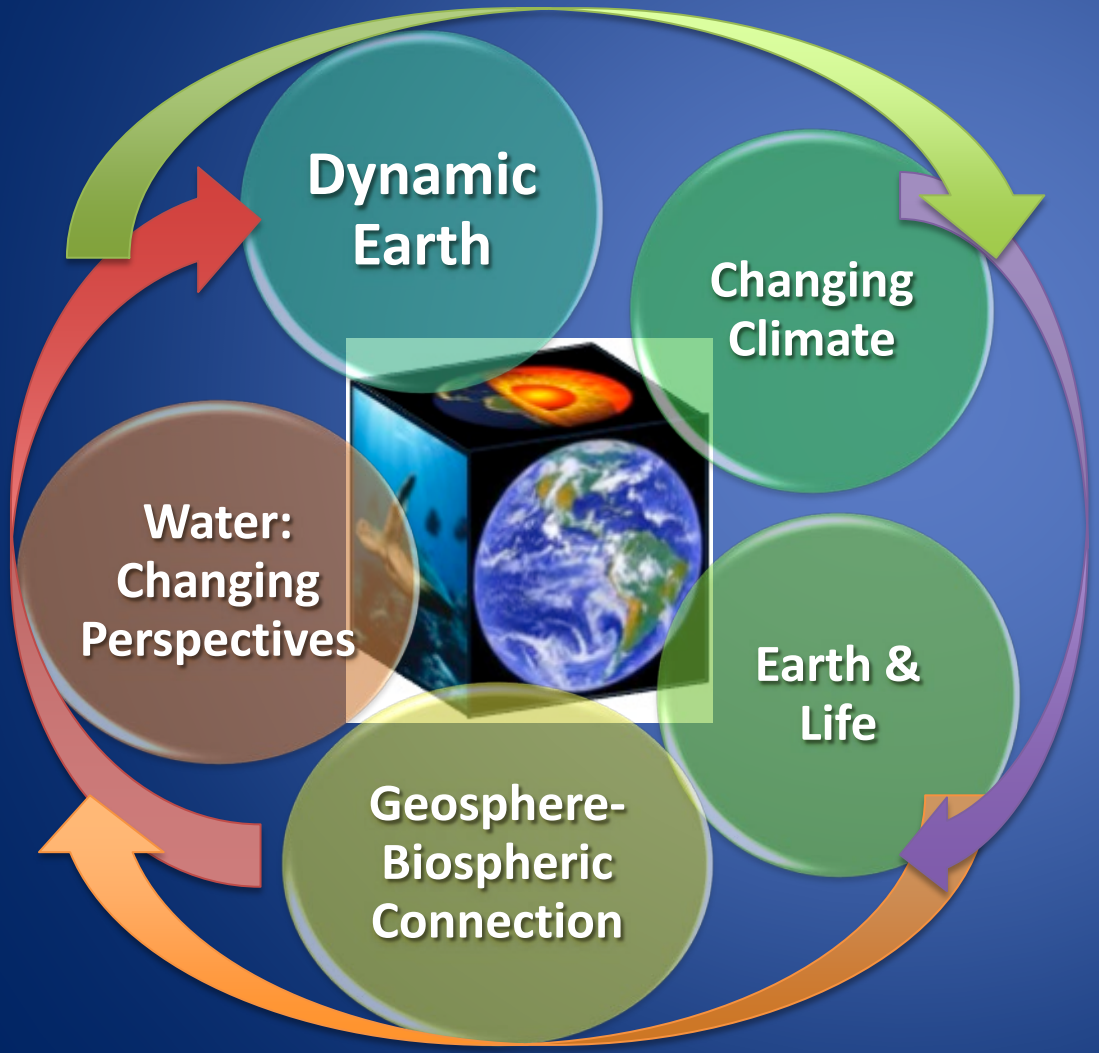
The 85% spend about 80% of their time looking for, collecting, and getting the necessary data together in a format they can use and about 20% of their time actually thinking/doing science

Both groups are not well integrated with one another and integration is needed to solve the complex, inter-related, and pressing environmental problems we and Earth are facing, with seriously heterogeneous data linking more homogeneous large data arrays

Why EarthCube?

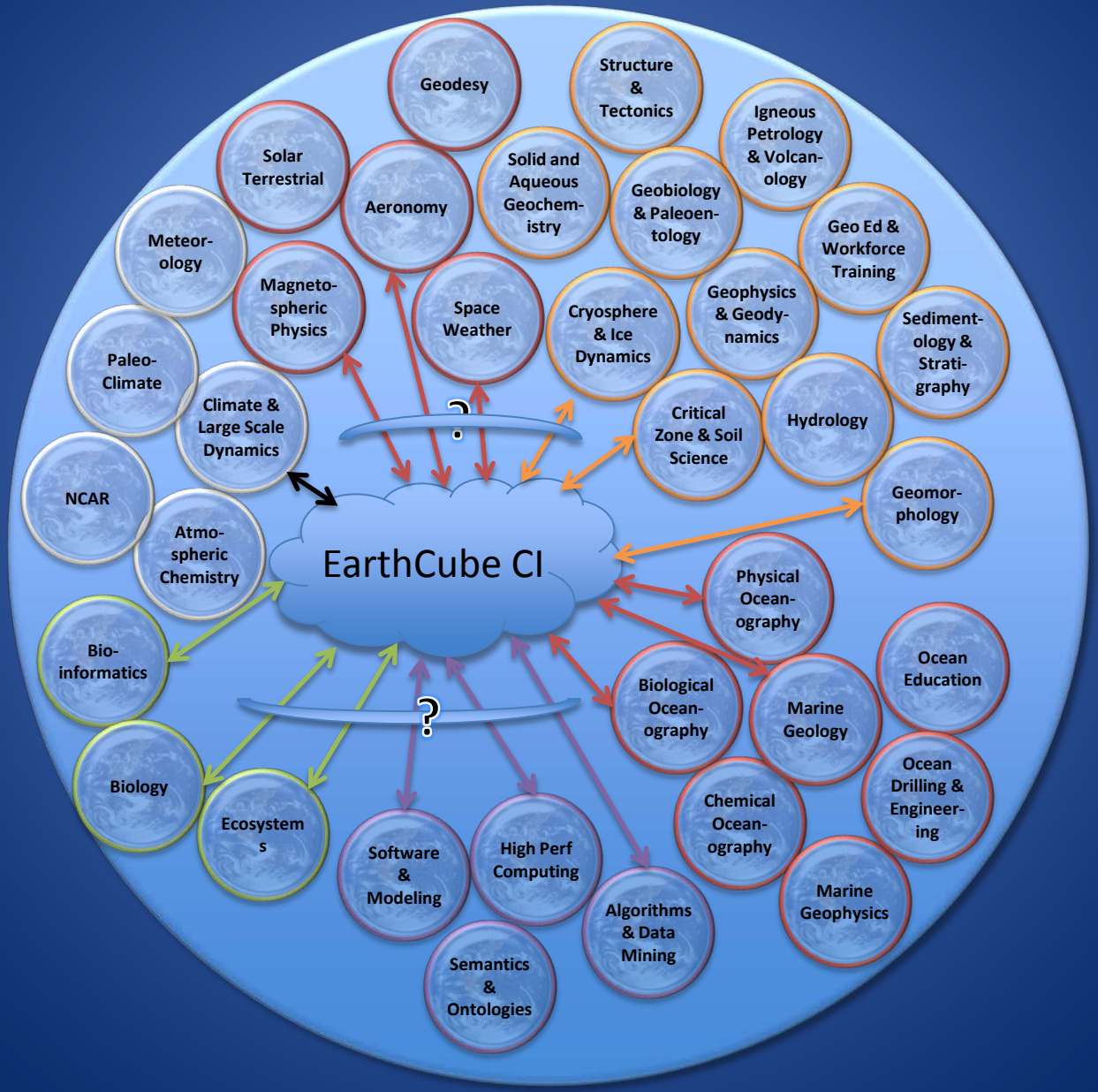
- Nature does not recognize separate disciplines.
- EarthCube will democratize access to data.
- EarthCube will increase research time by reducing time needed to find, access, and analyze data.
- EarthCube will enable more interdisciplinary research and the pursuit of new questions.
- EarthCube will accelerate the pace of discovery.
- EarthCube will give all scientists the same chance of making major contributions regardless of institution size or institutional endowment.

What Is EarthCube?



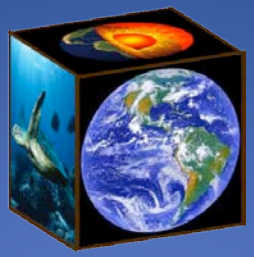
- Transform the conduct of data-enabled geoscience-related research.
- Create effective community-driven cyberinfrastructure.
- Allow global data discovery and knowledge management.
- Achieve interoperability and data integration across disciplines.

Who Is EarthCube? You Are!



Path to the Vision

An alternative approach to respond to daunting science and CI challenges



EarthCube is an outcome AND a process

EarthCube will require NSF and broad community involvement; new ways of doing

Important Features:

- Builds off existing data/modeling systems/cyberinfrastructure investments
- Provides tools/approaches that enhance data discovery, access, and integration
- Addresses serious cyber needs in fields where individual data points and observations are important
- Leverages investments across fields
- Allows for more integrative and interdisciplinary science

Blue Skying the EarthCube Future

Imagine:

- A world without laptops and WiFi - 22 yrs ago
- A world without cell phones – 20 yrs ago
- A world without digital cameras - 11 yrs ago
- A world without mobile GPS - 8 yrs ago
- A world without iPhones - 5 yrs ago
- A world without iPads – 2.5 yrs ago

Think of how much you depend on these tools!

Imagine:

- What would your life/science be without them?
- What the next advance will make possible!

Science Senarios Needed!

- 2-3 sentences on the science goal.
- 2-3 sentences on its importance.
- Summary of info, models, and tools needed and if they are all presently available and easy to use.
- Summary of expected results/deliverables (conclutions, models, derived/raw data products, etc.)
- A graphic of project workflow, potential data product.
- Person/group creating the scenario, institution, contact information (email).