Enhancing the User Interface (UI) with COG

ESGF F2F Workshop, December 2013

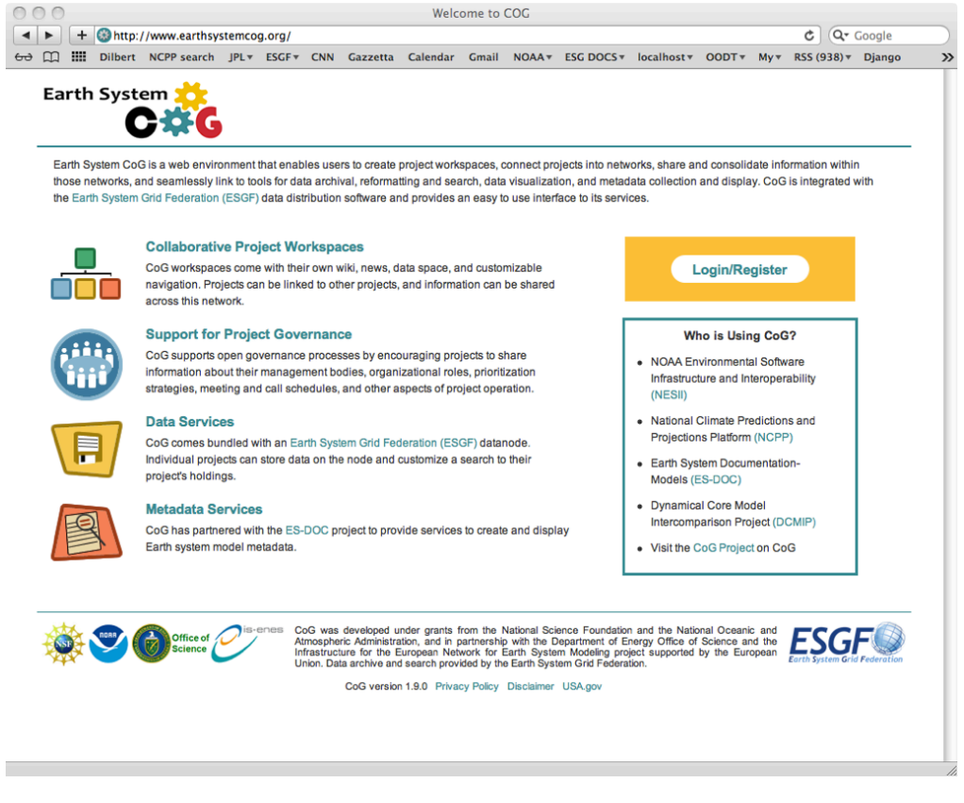
Luca Cinquini [1][2][3], Cecelia DeLuca [2], Sylvia Murphy [2], Allyn Treshansky [2]

[1] California Institute of Technology & Jet Propulsion Laboratory (NASA)
[2] Earth System Research Laboratory (NOAA)
[3] Lawrence Livermore National Laboratory (LLNL)

Brief CoG Overview

- CoG is a web-based environment for collaborative development of scientific projects that combines (1) data and metadata services, (2) content management, and (3) tools for project governance
- CoG is developed by NESII team at NOAA, first funded by NSF, now by NOAA
- CoG site is deployed operationally at NOAA: http://www.earthsystemcog.org/
- CoG currently supports a community of 10s of projects, 100s of users, including:
  - NCPP: National Climate Projections and Predictions
  - QED 2013: workshop on Quantitative Evaluation of Downscaling
  - DCMIP-2012: workshop on Dynamical Core Model Intercomparison
  - NESII projects: ESMF, NUOPC, ESMpy, ...
  - Obs4MIPs, Ana4MIPs, ...

- ESGF will adopt CoG as the next generation reference web interface - replacing the current web front end
- Goal: enhanced support for CMIP6 and other MIPs
- Timeline for CoG/ESGF integration: 12 months



CoG Functionality

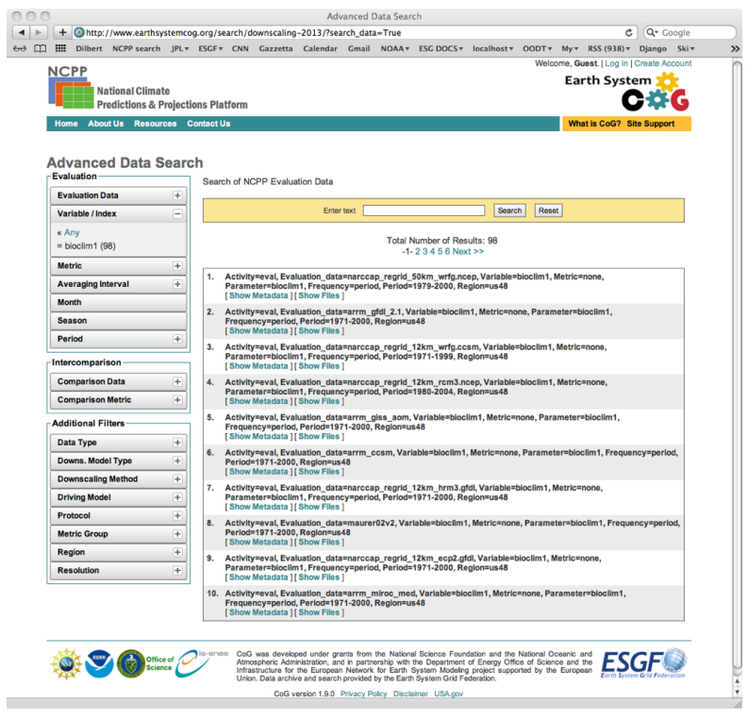
The CoG environment spans three areas of functionality:

- Data and metadata services: CoG provides a web UI to back-end services for data search and discovery, data download, and metadata display. In-fact, CoG can be configured as a UI to invoke the ESGF search services, and ES-DOC metadata viewer.
- Content management: CoG includes tools - wikis, file uploads, news feeds, ...- that allow project members to collaboratively author and expose project information, co-located with the data.
- Tools for project governance: CoG includes formal templates for formalizing and exposing the management structure and planning of a project: web pages for road maps, governance bodies, user support, funding sponsors, etc.

CoG Functionality

The CoG environment spans three areas of functionality:

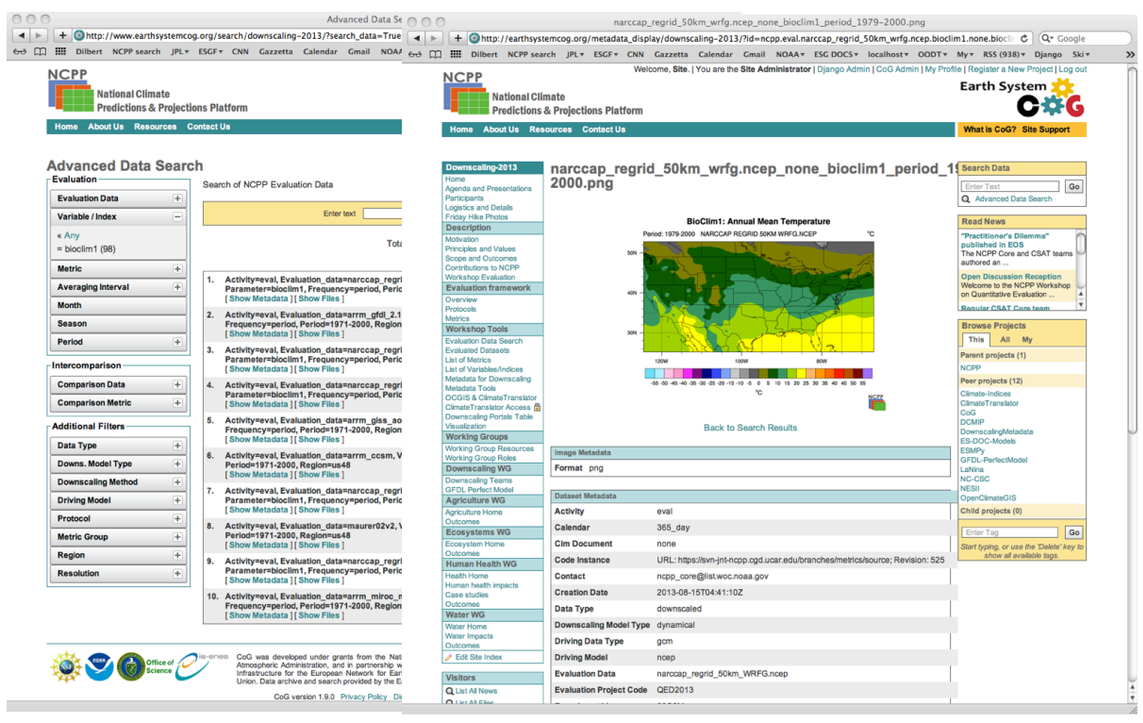
- Data and metadata services: CoG provides a web UI to back-end services for data search and discovery, data download, and metadata display. In-fact, CoG can be configured as a UI to invoke the ESGF search services, and ES-DOC metadata viewer.
- Content management: CoG includes tools - wikis, file uploads, news feeds, ...- that allow project members to collaboratively author and expose project information, co-located with the data.
- Tools for project governance: CoG includes formal templates for formalizing and exposing the management structure and planning of a project: web pages for road maps, governance bodies, user support, funding sponsors, etc.



CoG Functionality

The CoG environment spans three areas of functionality:

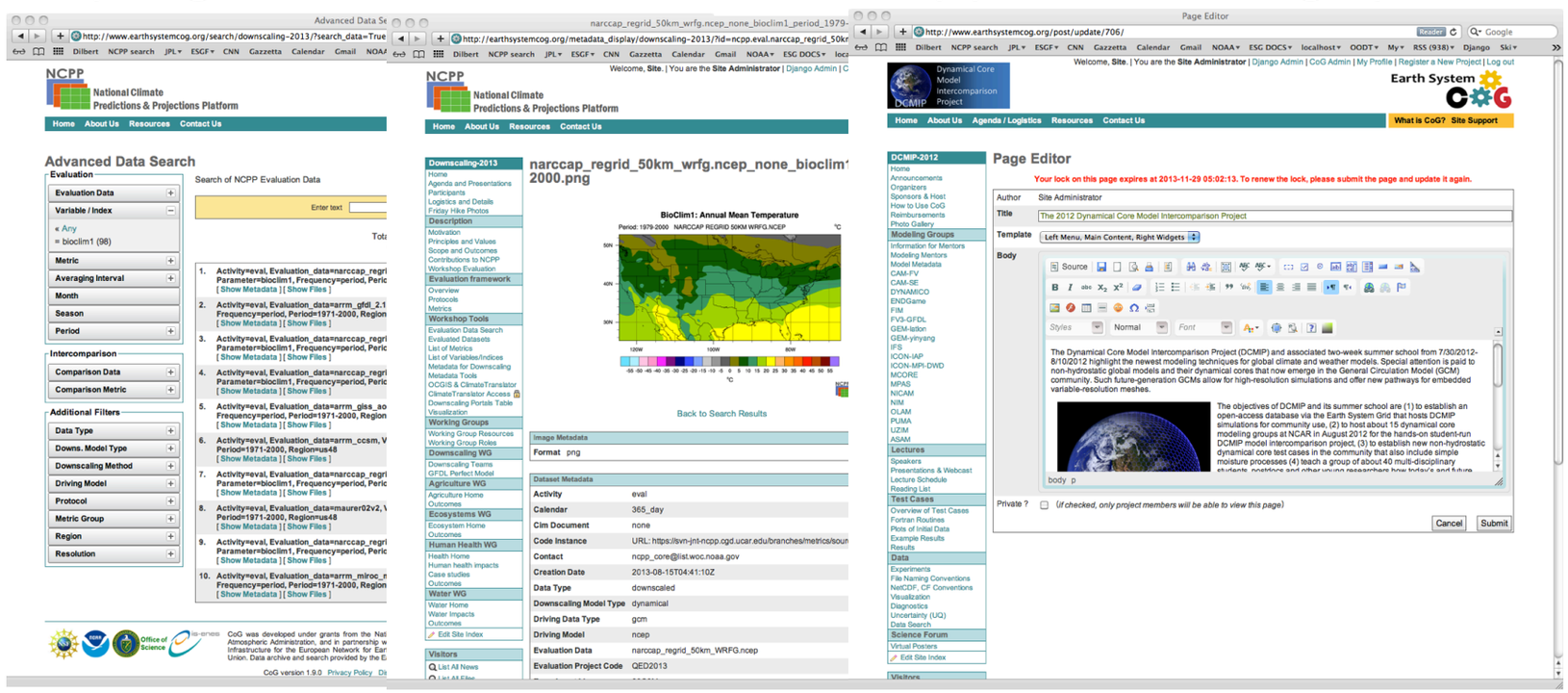
- Data and metadata services: CoG provides a web UI to back-end services for data search and discovery, data download, and metadata display. In-fact, CoG can be configured as a UI to invoke the ESGF search services, and ES-DOC metadata viewer.
- Content management: CoG includes tools - wikis, file uploads, news feeds, ...- that allow project members to collaboratively author and expose project information, co-located with the data.
- Tools for project governance: CoG includes formal templates for formalizing and exposing the management structure and planning of a project: web pages for road maps, governance bodies, user support, funding sponsors, etc.



CoG Functionality

The CoG environment spans three areas of functionality:

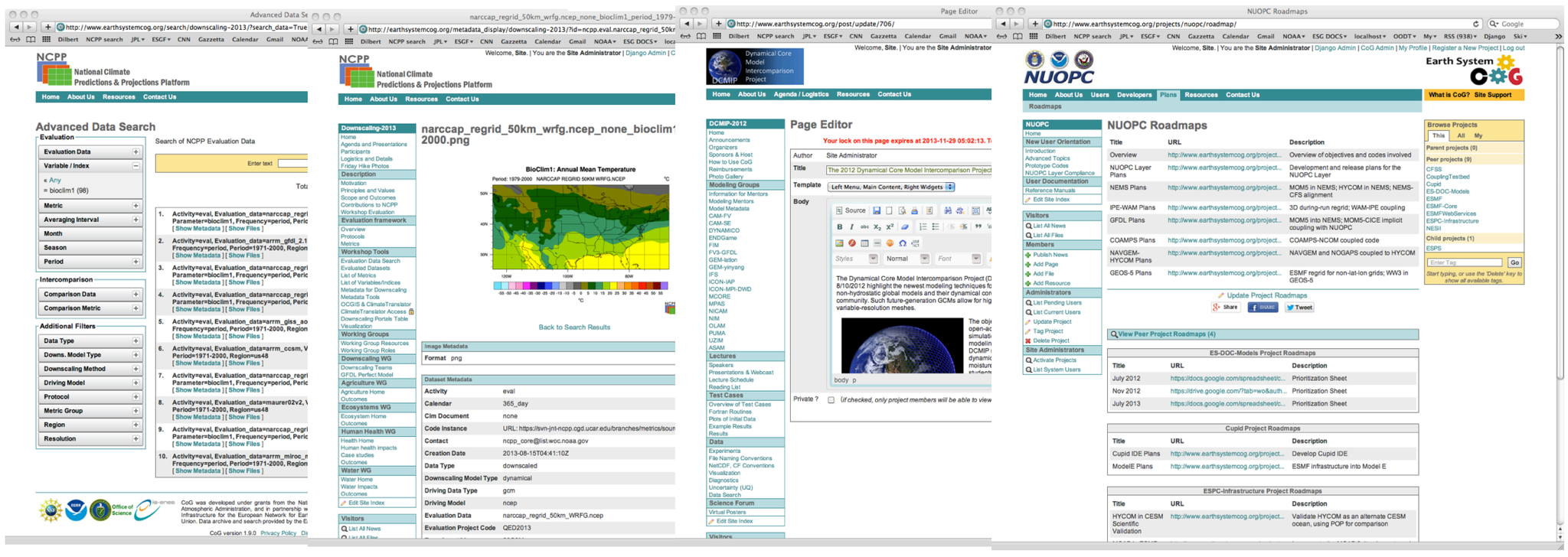
- Data and metadata services: CoG provides a web UI to back-end services for data search and discovery, data download, and metadata display. In-fact, CoG can be configured as a UI to invoke the ESGF search services, and ES-DOC metadata viewer.
- Content management: CoG includes tools - wikis, file uploads, news feeds, ...- that allow project members to collaboratively author and expose project information, co-located with the data.
- Tools for project governance: CoG includes formal templates for formalizing and exposing the management structure and planning of a project: web pages for road maps, governance bodies, user support, funding sponsors, etc.



CoG Functionality

The CoG environment spans three areas of functionality:

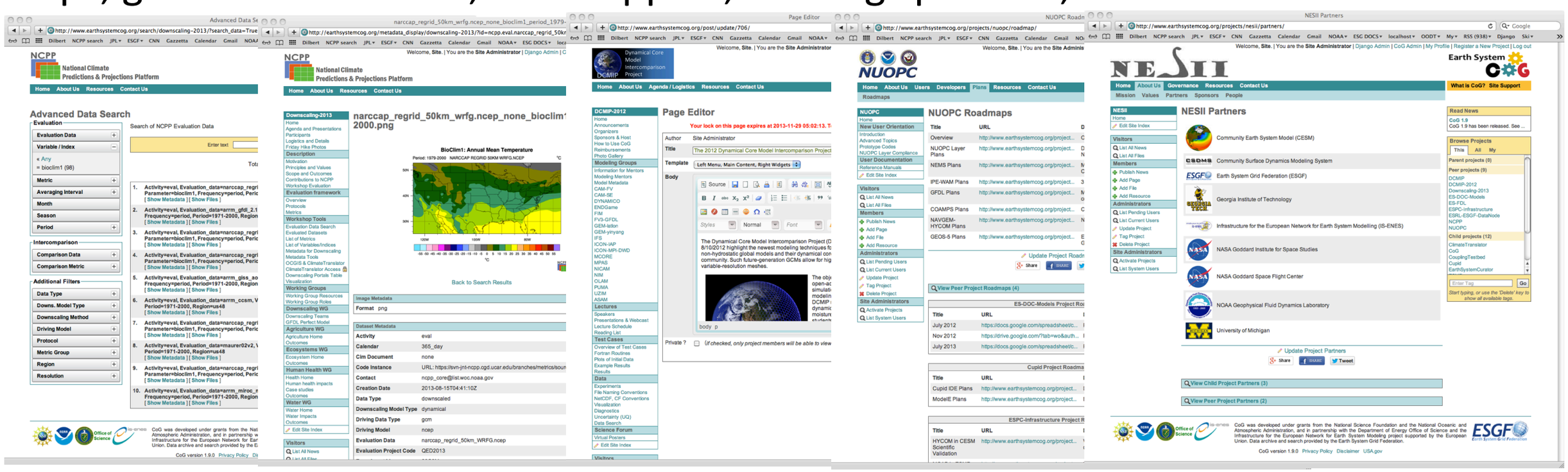
- Data and metadata services: CoG provides a web UI to back-end services for data search and discovery, data download, and metadata display. In-fact, CoG can be configured as a UI to invoke the ESGF search services, and ES-DOC metadata viewer.
- Content management: CoG includes tools - wikis, file uploads, news feeds, ...- that allow project members to collaboratively author and expose project information, co-located with the data.
- Tools for project governance: CoG includes formal templates for formalizing and exposing the management structure and planning of a project: web pages for road maps, governance bodies, user support, funding sponsors, etc.



CoG Functionality

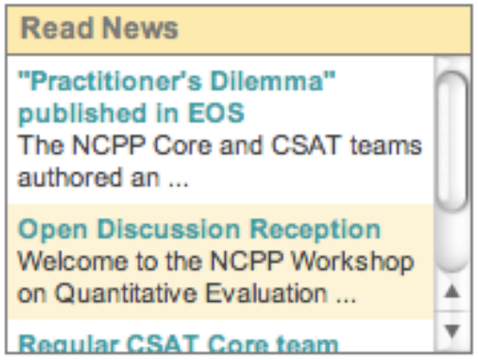
The CoG environment spans three areas of functionality:

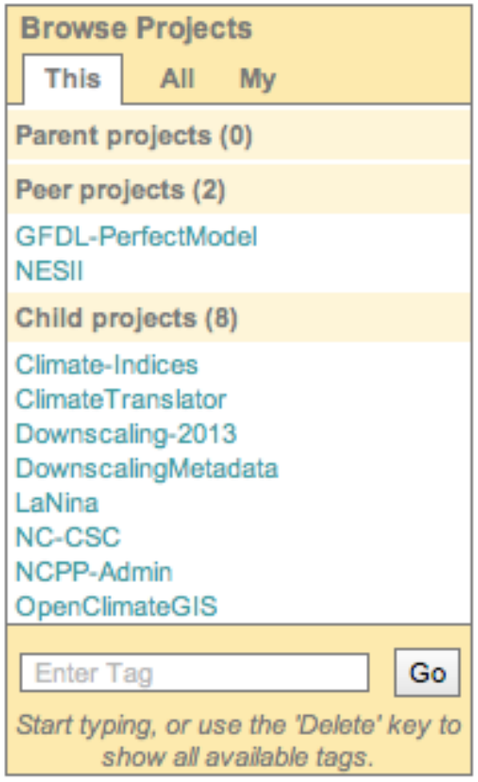
- Data and metadata services: CoG provides a web UI to back-end services for data search and discovery, data download, and metadata display. In-fact, CoG can be configured as a UI to invoke the ESGF search services, and ES-DOC metadata viewer.
- Content management: CoG includes tools - wikis, file uploads, news feeds, ...- that allow project members to collaboratively author and expose project information, co-located with the data.
- Tools for project governance: CoG includes formal templates for formalizing and exposing the management structure and planning of a project: web pages for road maps, governance bodies, user support, funding sponsors, etc.



Rationale for CoG Adoption

- Platform that combines data services (search, download) with content management:
  - Data and documentation can be co-located
  - Documentation can be developed collaboratively by project members
- Support for multiple projects, with customizable features:
  - Projects can customize content, home page, search constraints and facets
  - Projects can establish a network of peers, parents and children
  - Related projects can be tagged with keywords (“MIP”, “Climate”)
- Includes many additional features not currently available in ESGF:
  - Broadcasting of news to a network of projects
  - Support for images and other media as data products
  - Users may upload files to share with others
  - Project level bookmarks, organized by topic
  - Users profile, integration with social media
- Pleasing, functional, well tested UI
- Software stack is based on Python+Django:
  - Modular composition of apps within CoG project
  - Integration path with UV-CDAT Live, other Django apps
  - Collaborative development with ESGF Python community





Roadmap for ESGF-CoG Integration

Most critical development tasks needed before CoG can replace current ESGF web-fe:

- Support for single Sign On authentication (with openID)
- Interfaces to services for management of ESGF group membership (for access control)
- Projects federation
- Data cart with support for wget scripts
- Expanded configuration for site customization
- Installation
  - Integration with ESGF installer (with Apache httpd and mod_wsgi)
  - Standalone upgrade
- Migration of current users and memberships (or re-registration)

CoG Infrastructure and Governance

- CoG is open source, with BSD-2 license
- CoG software is hosted on GutHub: https://github.com/EarthSystemCoG
  - Code repository
  - Ticket tracking, organized by release
- CoG documentation on CoG site itself: http://earthsystemcog.org/projects/cog/

- Development process:
  - Current team composed of 4 people (developers and managers) at NESII/NOAA
  - Weekly technical meetings
  - Quarterly prioritization meetings with stakeholders, scheduling tasks for next one or two releases

- Rigorous release process:
  - Release candidate is deployed on test server
  - Each ticket tested and closed by a person other than the developer
  - Full site functionality is tested before and after the release
  - Since inception: 19 almost monthly releases, approx. 80 database migrations, with no data loss :)