

The Cooperative Institute for Climate Science

Presented by

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Geophysical Fluid Dynamics Laboratory Review

May 20 – May 22, 2014



What is CICS? History

- June 1967: Establishment of collaborative program in geophysical fluid dynamics between GFDL and Princeton University Atmospheric and Oceanic Sciences (AOS) program, an autonomous PhD program within the Department of Geosciences.
- October 2003: Establishment of CICS, combining AOS collaboration with new research initiatives in Princeton Climate Center of Princeton Environmental Institute, within NOAA CI framework.
- July 2008: CICS award renewed after re-competition
- July 2013: CICS award renewed for further 5 years, following “Outstanding” SAB review in 2011.

What is CICS?

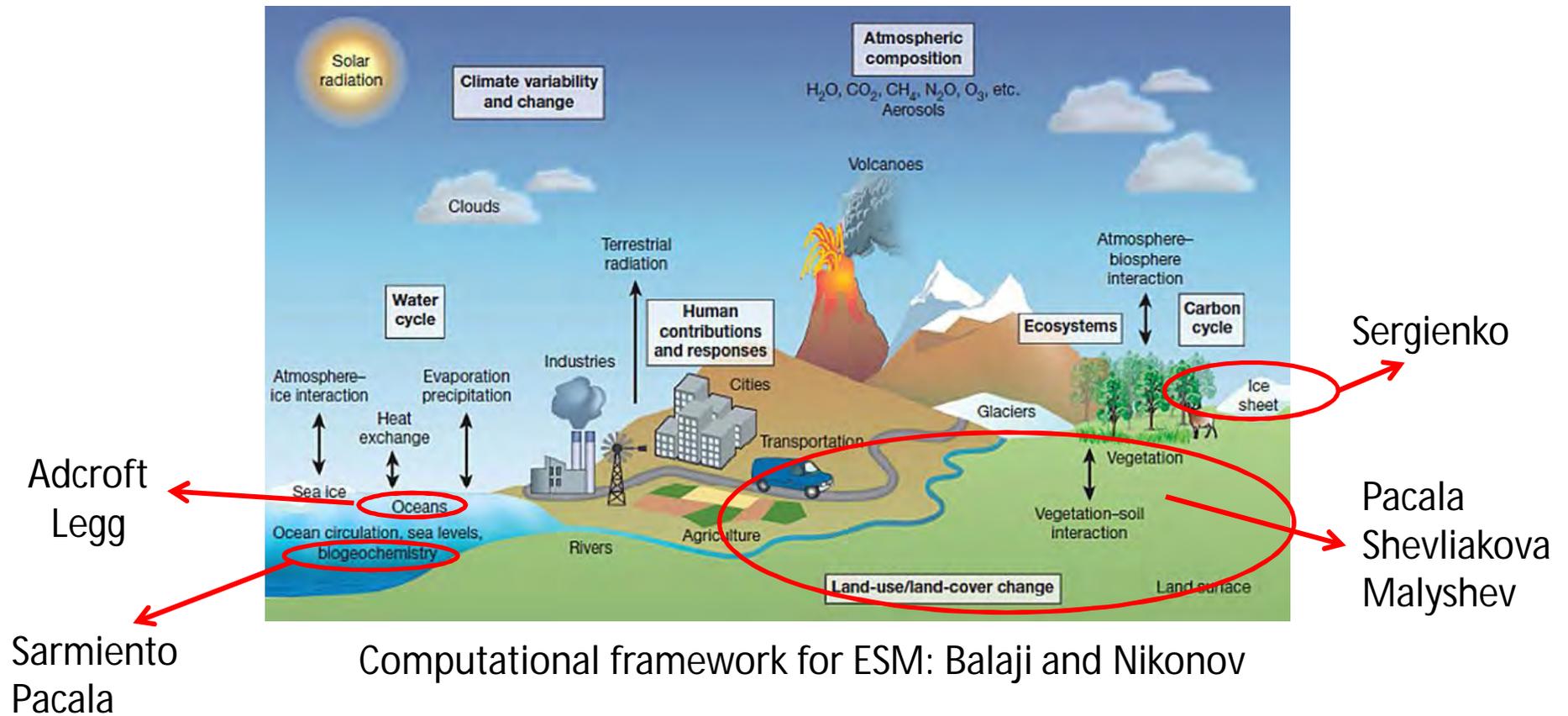
- A grant from NOAA to PU, providing
 - TASK I: administrative support for CICS, including outreach in AOS and PEI.
 - TASK II: Cooperative research projects , including support for Princeton research staff based at GFDL, and students and post-docs advised by GFDL scientists.
 - TASK III: Princeton faculty principal investigator-led research projects, supporting GFDL's goals
- CICS current personnel:
 - Task II: Princeton research staff based at GFDL: 7;
Postdocs and visiting scientists: 13; Students: 12
 - Task III: Princeton faculty with CICS funding (last 5 years): 13
 - Sandy supplemental personnel: 4
- CICS funds are leveraged with funds from other agencies raised by CICS personnel.

Princeton faculty associated with CICS

- **Geosciences**
 - Michael Bender
 - Stephan Fueglistaler
 - David Medvigy
 - George Philander
 - Jorge Sarmiento
 - Daniel Sigman
 - Frederik Simons
 - Bess Ward
- **Civil and Environmental Engineering**
 - Elie Bou-Zeid
 - James Smith
 - Erik Vanmarcke
 - Eric Wood
- **Mechanical and Aerospace Engineering**
 - George Mellor
 - Alexander Smits
- **Ecology and Evolutionary Biology**
 - Lars Hedin
 - Steve Pacala
 - Simon Levin
- **Woodrow Wilson School**
 - Michael Oppenheimer
 - Denise Mauzerall
- **Rutgers University**
 - Enrique Curchitser

CICS contributions to GFDL research mission

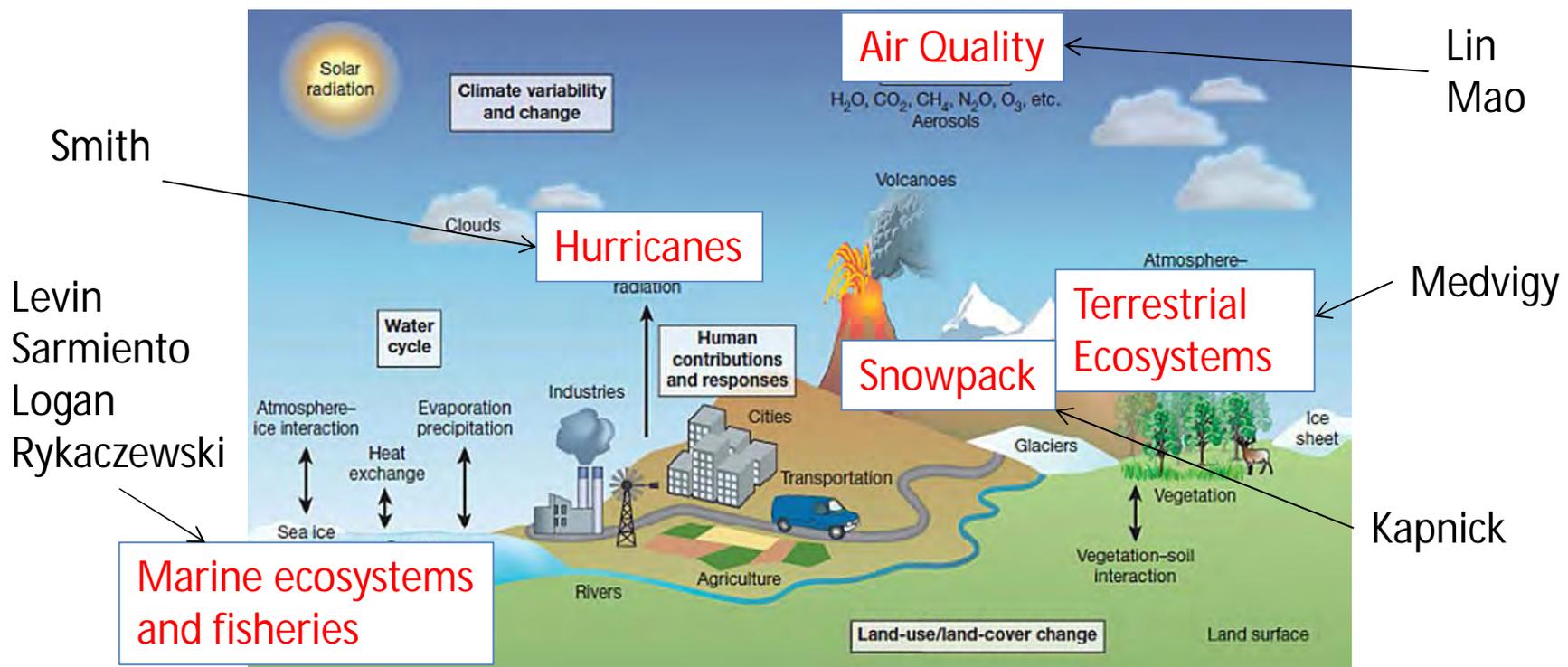
Major CICS contributions to Earth system model development



CICS research staff and Princeton faculty have a key role in development of ESM components

CICS contributions to GFDL research mission

Examples of earth system model applications by CICS scientists.



CICS and GFDL publications

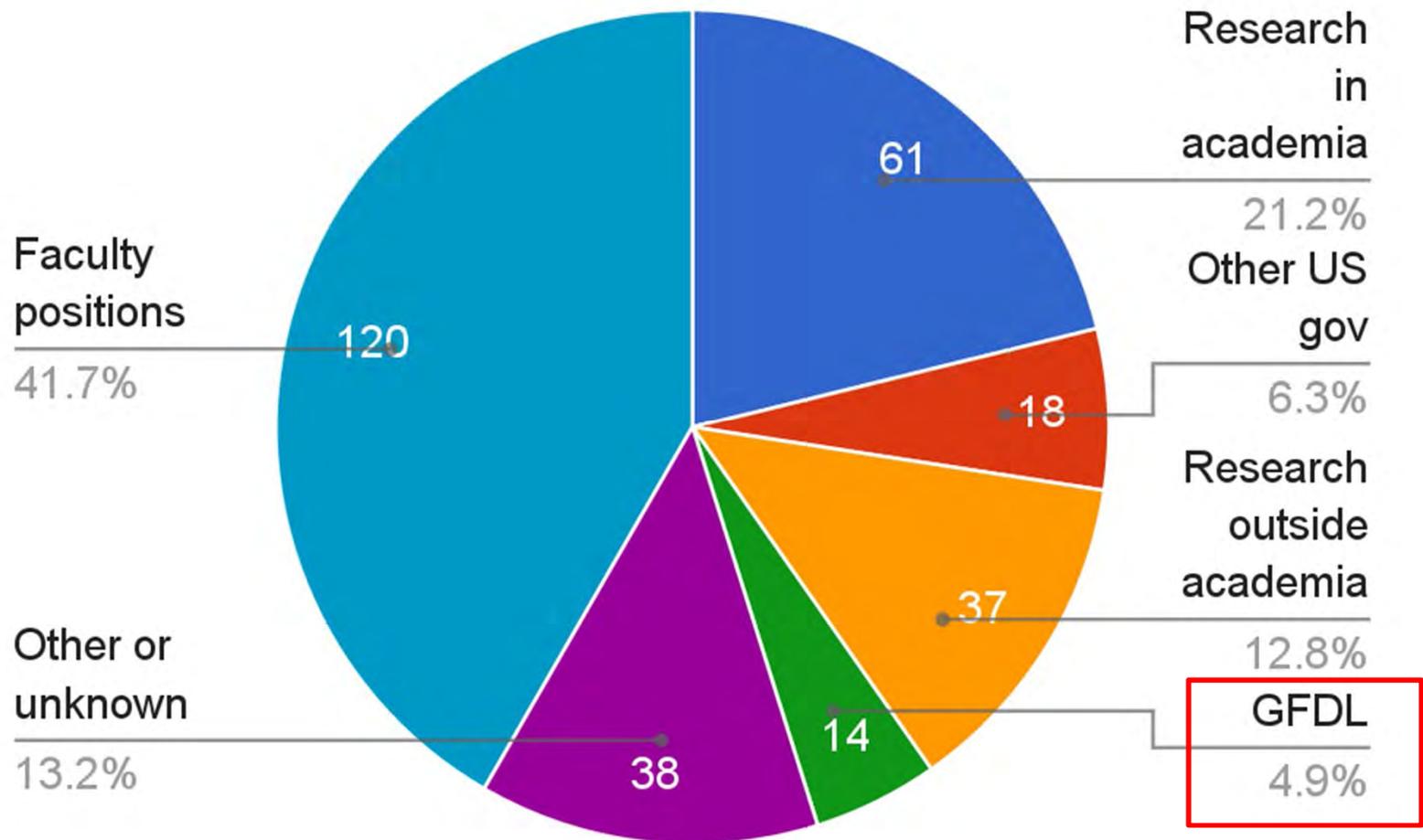
Publications

Year	CICS (Fiscal year)	GFDL (Calendar year)	GFDL w/ Princeton co- authors
2009	55	107	42 (39%)
2010	61	139	68 (49%)
2011	66	148	81 (55%)
2012	70	125	62 (50%)
2013	72	205	110 (54%)

CICS contributions to GFDL education and training: the postdoctoral and visiting scientist program.

- Program details
 - A standing crop of about 10 junior scientists (postdocs), funded by CICS.
 - Postdocs are selected by a committee of University and GFDL senior scientists and formally appointed through the University.
 - Senior scientists from other Universities may visit for short periods for joint research or sabbaticals.
- Attract the brightest junior scientists to GFDL
- Cross-fertilization between academia and GFDL
- Provide flexibility to GFDL workforce (e.g. Sandy supplemental)
- Facilitate GFDL involvement in multi-institutional academic collaborations e.g. Climate Process Teams.

Present employment of AOS postdocs and senior visiting scientists

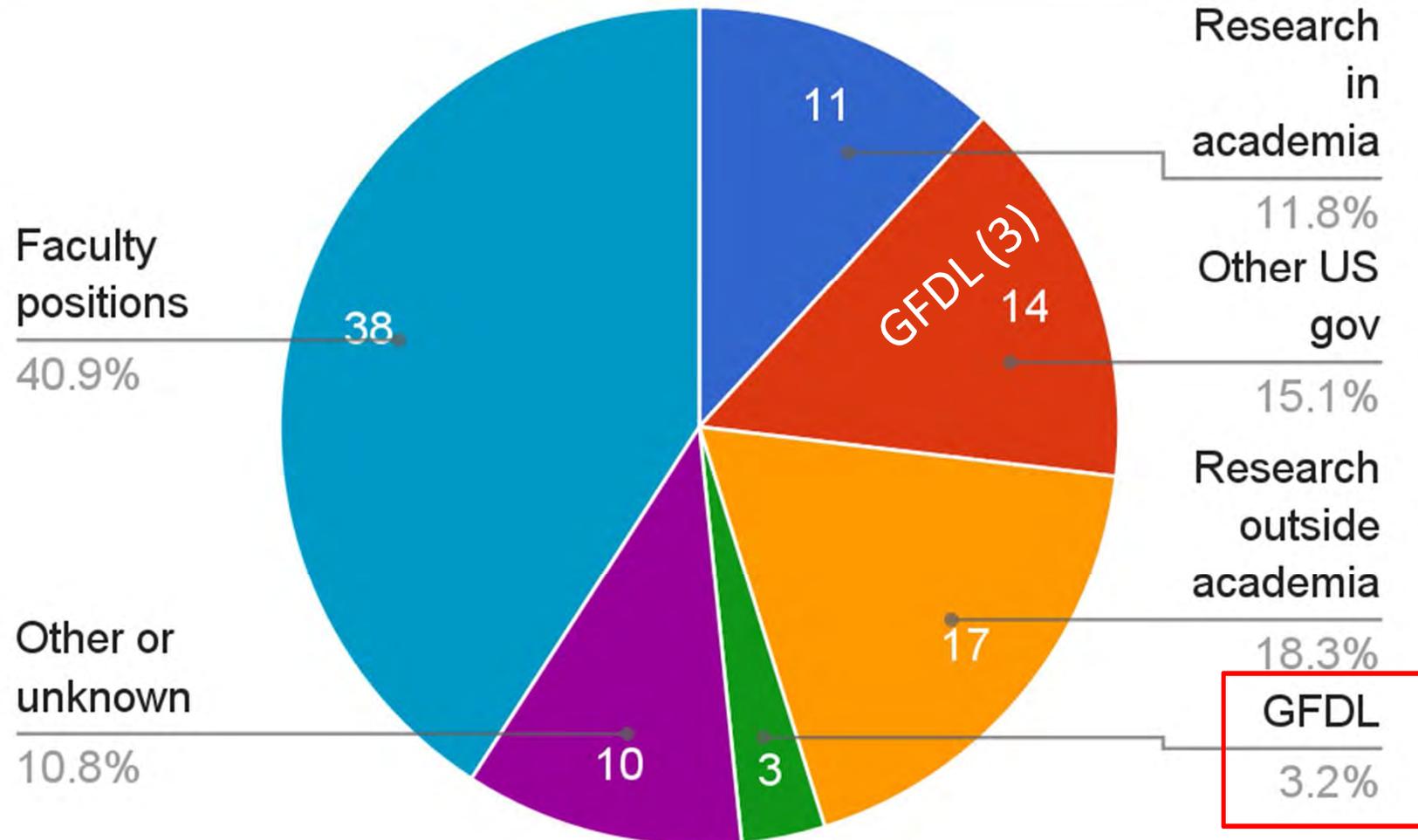


Postdoc program has been very successful, with many faculty and GFDL appointments.

CICS contribution to GFDL education and training: the AOS graduate program

- The Atmospheric and Oceanic Sciences (AOS) Program is an autonomous Program, part of the Dept. of Geosciences.
- Graduate program faculty of 12-15 includes about 10-12 GFDL employees, who teach courses and advise graduate students.
- About 20 students in total, supported in their first year by the University, subsequently by CICS as well as grants and fellowships. (Currently 5 students hold NSF fellowships).
- AOS students benefit from access to GFDL resources and Princeton academic environment.
- 93 Ph. D. graduates of the Program.

Present employment of AOS PhD recipients

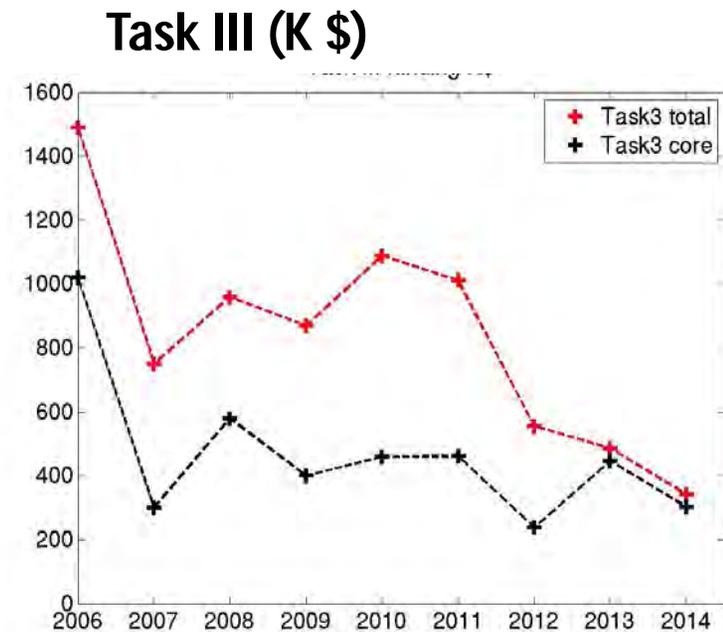
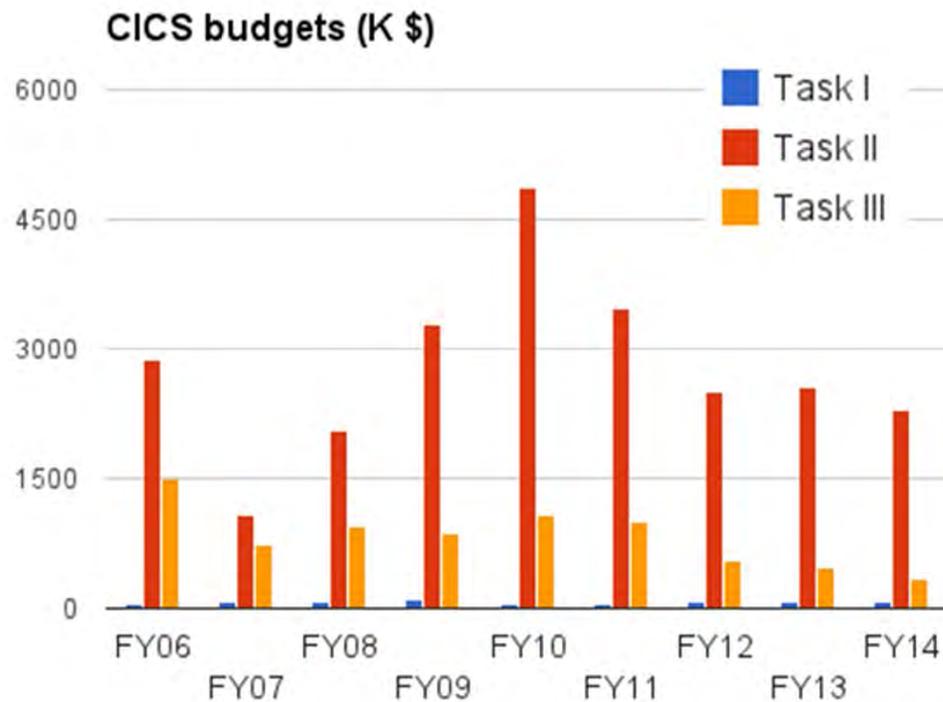


One of the most successful graduate programs in the country in placing PhDs in academic and research employment.

CICS contribution to GFDL education and training: Workshops and outreach

- CICS Workshops and summer schools: Combine GFDL expertise and resources with Princeton University facilities and support through CICS.
- Examples:
 - Professional development summer institute in weather and climate
 - Applying IPCC-class models of global warming to fisheries prediction
 - Coral vulnerability workshop
 - Advancing land-use modeling and analysis for carbon cycling
- Internships: MPOWIR graduate internship funded through CICS.
- K-12 Outreach events: GFDL/AOS participation facilitated by CICS.

Challenges to CICS mission



Large variability in funding levels.

FY14 does not include Sandy Suppl. (\$2770K for 4 years)

Cooperative institute for Climate Science: summary

- CICS provides mutual benefit to GFDL and Princeton.
- GFDL benefits from involvement with students, postdocs, researchers and faculty with diverse climate-related interests.
- CICS-facilitated collaboration with GFDL is key to Princeton University climate science research.
- Interaction with a wider range of faculty limited by availability of funding.