

# The Cooperative Institute for Climate Science

Presented by

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# 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?

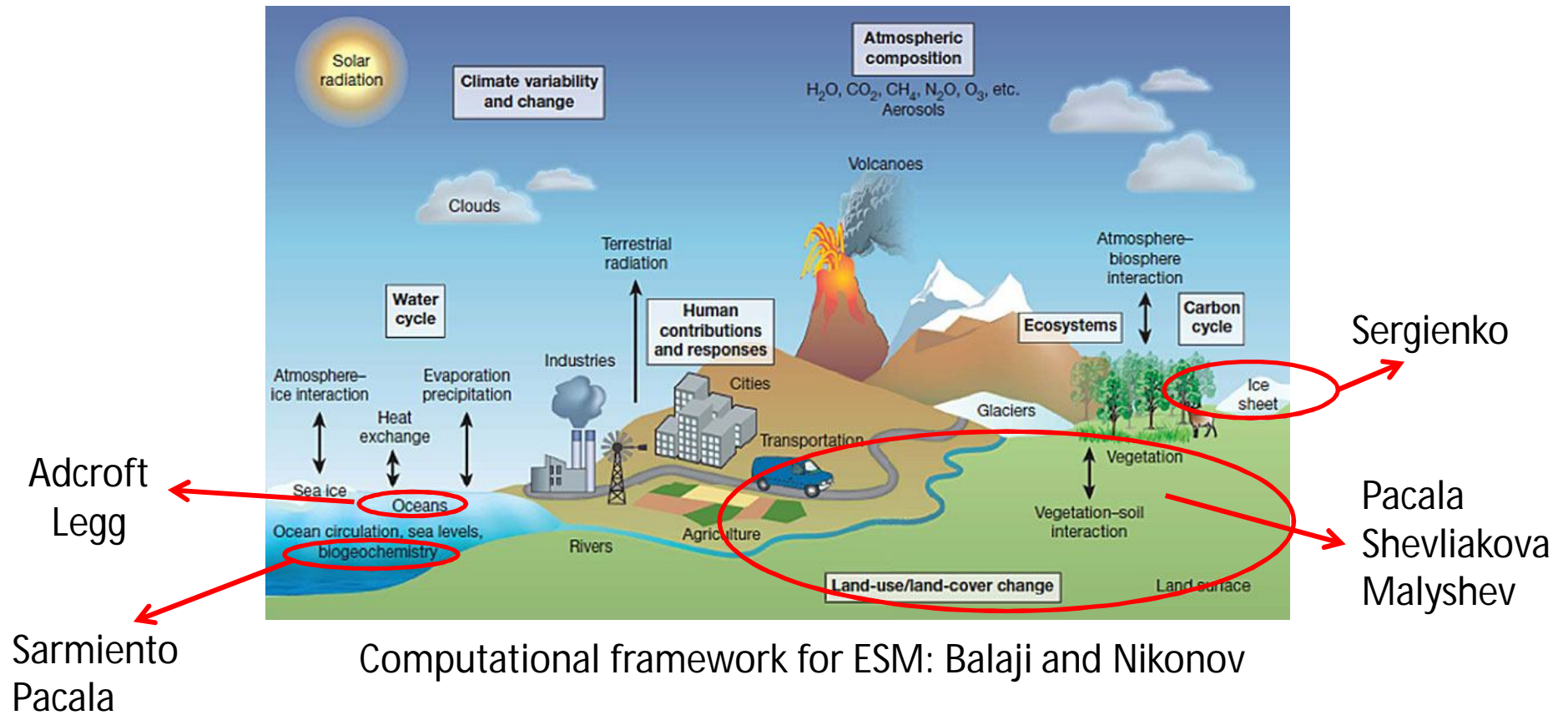
- A grant from NOAA to PU, providing
  - TASK I: administrative support for CICS, including outreach in AOS and PEI.
  - TASK II: Cooperative research projects , including support for Princeton research staff based at GFDL, and students and post-docs advised by GFDL scientists.
  - TASK III: Princeton 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

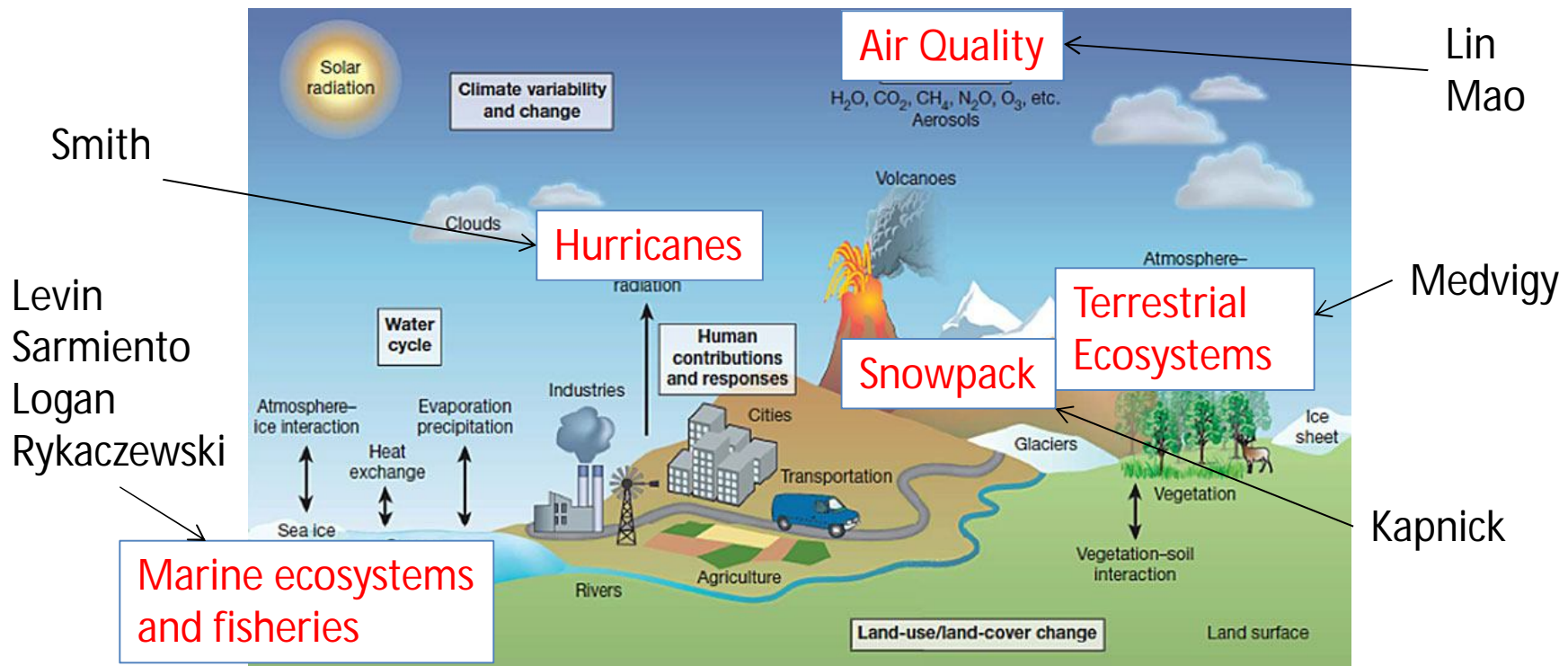


CICS research staff and Princeton faculty have a key role in development of ESM components



# CICS contributions to GFDL research mission

Examples of earth system model applications by CICS scientists.



# CICS and GFDL publications

## Publications

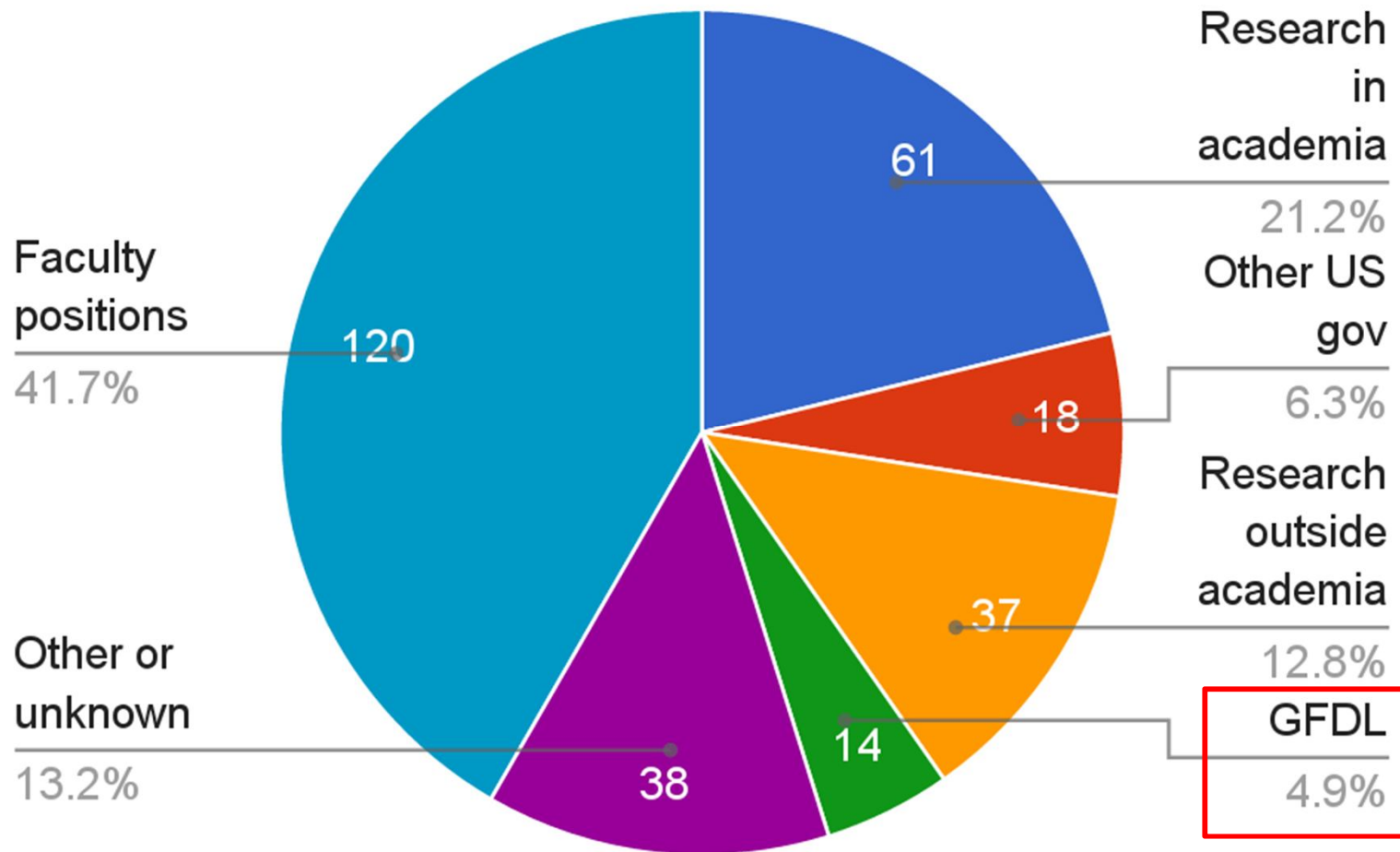
<b>Year</b>	<b>CICS</b> (Fiscal year)	<b>GFDL</b> (Calendar year)	<b>GFDL w/ Princeton co- authors</b>
2009	55	107	42 (39%)
2010	61	139	68 (49%)
2011	66	148	81 (55%)
2012	70	125	62 (50%)
2013	72	205	110 (54%)

# 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

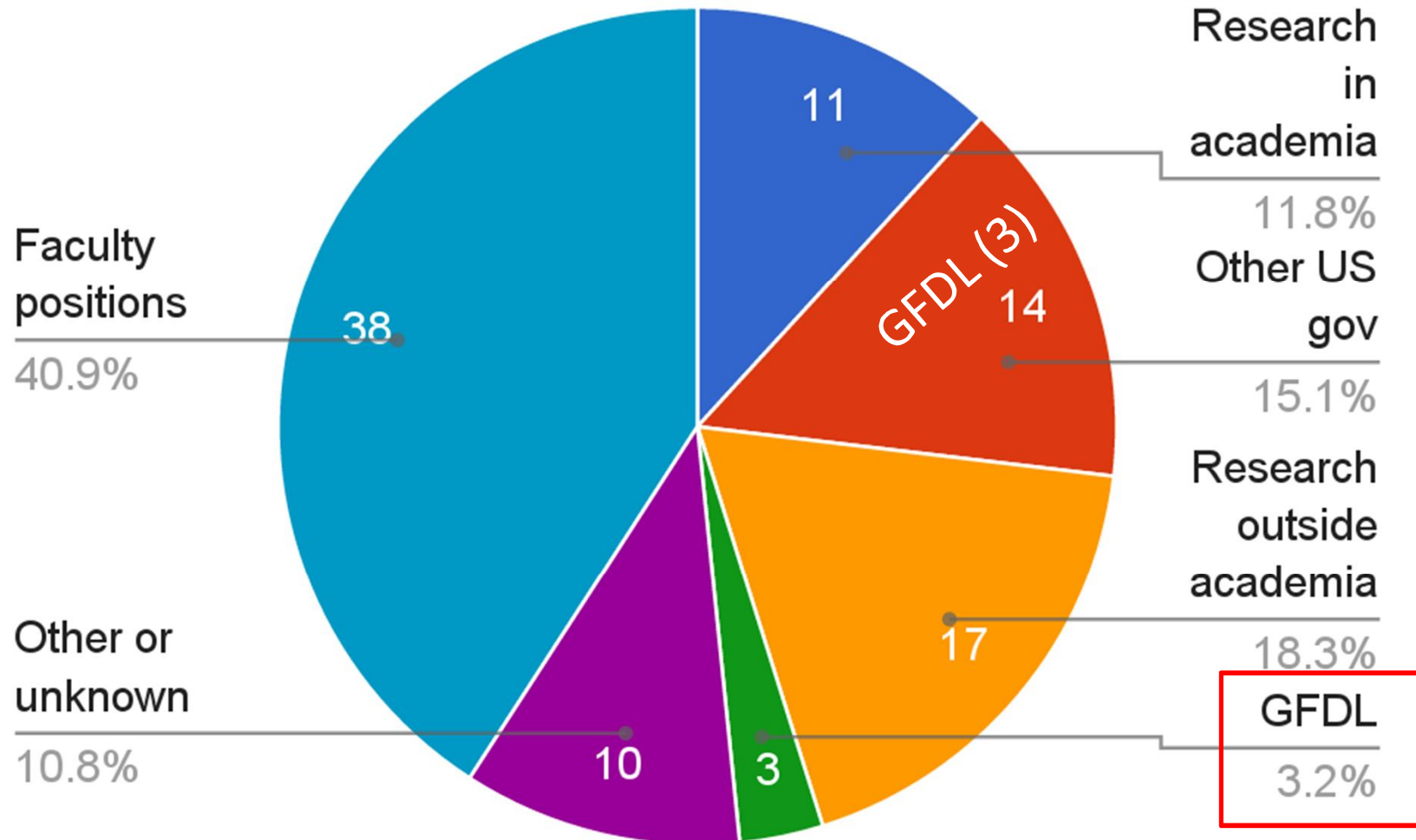


Postdoc program has been very successful, with many faculty and GFDL appointments.

# 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

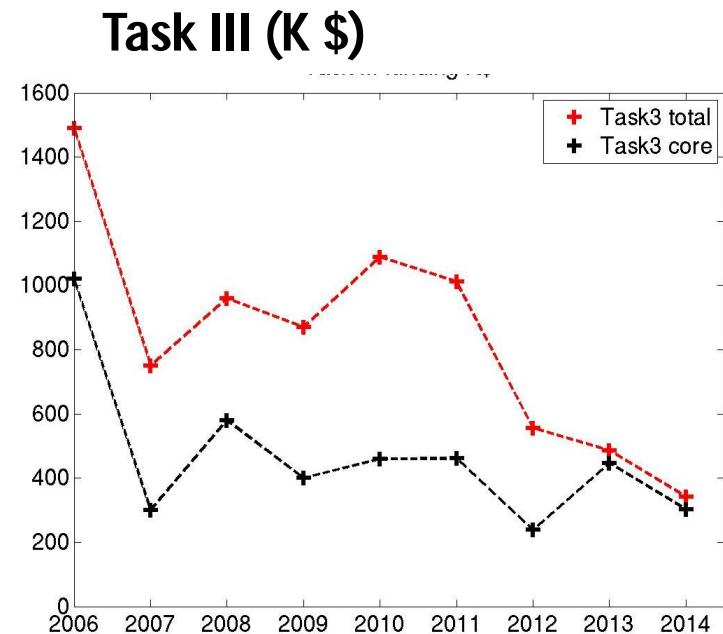
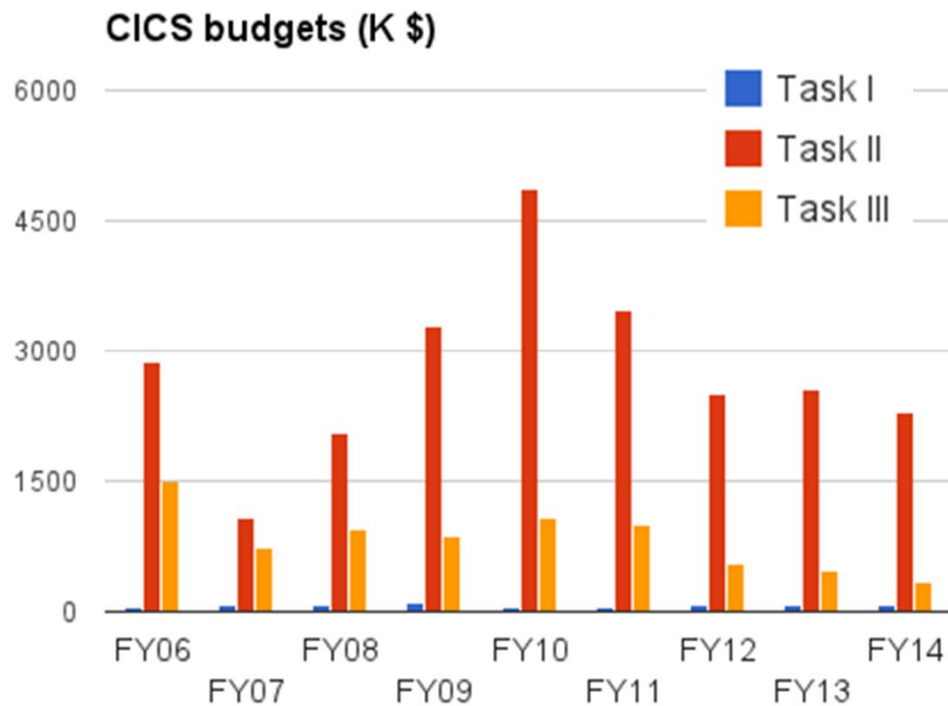


One of the most successful graduate programs in the country in placing PhDs in academic and research employment.

# 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.