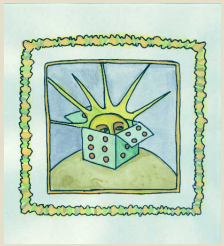
Overview of Geophysical Statistics Project

Outline

- **Mission and overview**
- **GSP members: past, present and future.**
- **Project Leader**



GSP Advisory Panel, April 27, 2006

NCAR

Mission of GSP

The Geophysical Statistics Project pursues the innovative application and development of statistical methodology to address problems faced in the Earth sciences. A complementary activity is to generalize specific problems in the geophysical sciences to broad based statistical research.

GSP overview

PI's: Rol Madden (CGD)* Rick Katz (ISSE), Joe Tribbia (CGD), Doug Nychka (GSP),Jeff Anderson** (DA)

Base Funding: NSF-DMS probability and statistics
Original* 7/93–6/99 4M
Renewal 7/99–6/04 3M
Current ** 7/04–6/07 500K, 330K, *450K*

Permanent Staff: Project leader, Associate Scientist III (Tim Hoar at 50%)

Postdocs: 4-6 recent Statistics PhD's on two year terms

Visitors: Senior and junior statistical scientists, local statistics faculty, shorter term visitors, Ph D graduate students.

Guidance: External advisory panel of statistical and atmospheric scientists.

GSP Accomplishments

- Statistical research with application to the geosciences
- Statistics postdoctoral training
- Impact on NCAR and the geosciences
- Enrichments to statistics community

GSP members and placement

- Reinhard Furrer, Colorado School of Mines
  (GSP Sep 2002 – Jun 2005)
- Curtis Storlie, Univ. New Mexico, SAMSI post doc
  (GSP graduate student 5/03 – 8/05)
- Mikyoung Jun, Texas A&M University,
  (GSP Aug 2005 – Dec 2005)
- Dorin Drignei, Oakland University, MI
  (GSP 6/04 – 8/06)
- Tomoko Matsuo, (GSP 6/03 –)
- Eva Furrer, Postdoctoral Researcher (8/05 –)
  currently on maternity leave
- Shree Khare, (GSP 7/05 – 8/06)
  SAMSI post doc 12/04-6/05

GSP members (cont)

- **Anders Malmberg, (GSP (9/05 –)**
- **Dan Cooley (GSP 09/05 –)**
  Joint with Colorado State University
  (GSP graduate student 6/03 – 10/05)
- **Local statistics faculty: Steve Sain (2 months)**
  Currently supported through other sources

Project leader support

Interim Senior mentoring and leadership:

- Chris Wikle, Univ. Missouri, Fall '05
  Collabotating Anders Malmberg
- Steven Sain, CU-Denver, Spring '06
  Collaborating with Dan Cooley
- Richard Smith, Univ. North Carolina, Jan- June '06
  Project leadership and mentoring Dan Cooley.
- Rick Katz, 20% joint appointment in GSP
  Project leadership, mentoring Eva Furrer.

Recruitment of permanent Project Leader:

Budget approval in December 2005.

Position is to be filled at least at the level of Scientist 3 (Associate Professor). Interviews of three qualified candidates completed.

Search committee has evaluated candidates (4/24).

HR approval for offers early next week.

Composition of GSP Year 3

Anders Malmberg (–7/2007)
CO fields, Balance constraints in ensemble forecasts

Dan Cooley (–7/2007)
Extremes

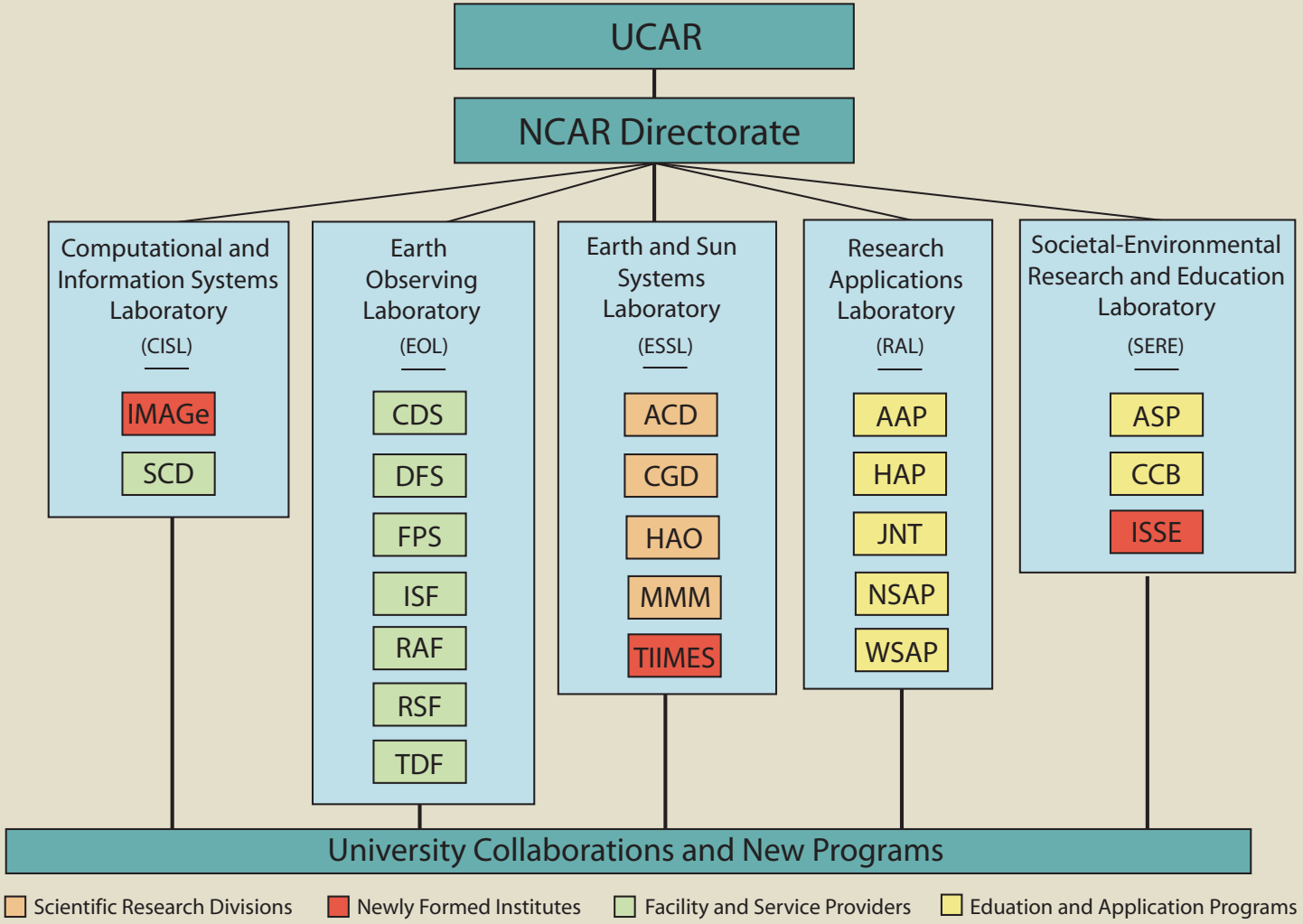
Eva Furrer (flexible –)
Weather generators, Kriging asymptotics.

Cari Kaufman, Carnegie Mellon, (8/2006–7/2008) (joint appointment with SAMSI) MLE for large covariance matrices, Inference for spatial fields.

Bo Li, Texas A&M, (7/2006 – 6/2008) Calibration of Doppler radar, Climate and health.

Potential support for one additional post doc or for joint appointments.

Background on GSP's Home



Institute for Mathematics Applied to the Geosciences (IMAGe)

IMAGe is an Institute at NCAR on par with the traditional science divisions created as part of the reorganization of NCAR (October 2004). It is part of the Computational and Information Systems Laboratory.

Vision:

IMAGe brings mathematical models and tools to bear on fundamental problems in the geosciences and will be a center of activity for the mathematical and geophysical communities.

What is new about IMAGe

- Organized around models and methods instead of a specific area of geosciences.
  e.g. *Turbulence*: a fundamental multiscale phenomena that cut across all NCAR science,
  Data Assimilation: general methods for fusing numerical models and data.
- Will coordinate and sponsor a regular *Theme-of-the-year* that focuses on a particular topic in the geosciences that has mathematical import.
- Large visitor program and training component.
- Community resource for computational and statistical methods.

Who we are ...

Current Roster: **18 staff (8 post docs) and 5 other scientific joint appointments.**

Support: **Balanced between NCAR core funds and external grants.**

IMAGe sections:

- *Data Assimilation Research Section* **(DAReS)**
- *Geophysical Turbulence Program* **(GTP)**
  Turbulence Numerics Team **(TNT)**
- *Geophysical Statistics Project* **(GSP)**

Provisional: TOY '07 Statistical science and geophysical models

Linking the modeling and analysis of climate models with statisticial methods for the design and analysis of computer experiments and the analysis of large spatial data sets.

SAMSI programs:
High Dimensional Inference and Random Matrices (Fall 2006)
Development, Assessment and Utilization of Complex Computer Models (Full year 2006-2007)

TOY Program:
Two or more cosponsored workshops at NCAR
Shared post doc(s).
Coordinated and web-linked working groups.
Long term statistical visitors at NCAR.