2013 Joint DTC-EMC-JCSDA GSI Community Tutorial

Hui Shao

Developmental Testbed Center
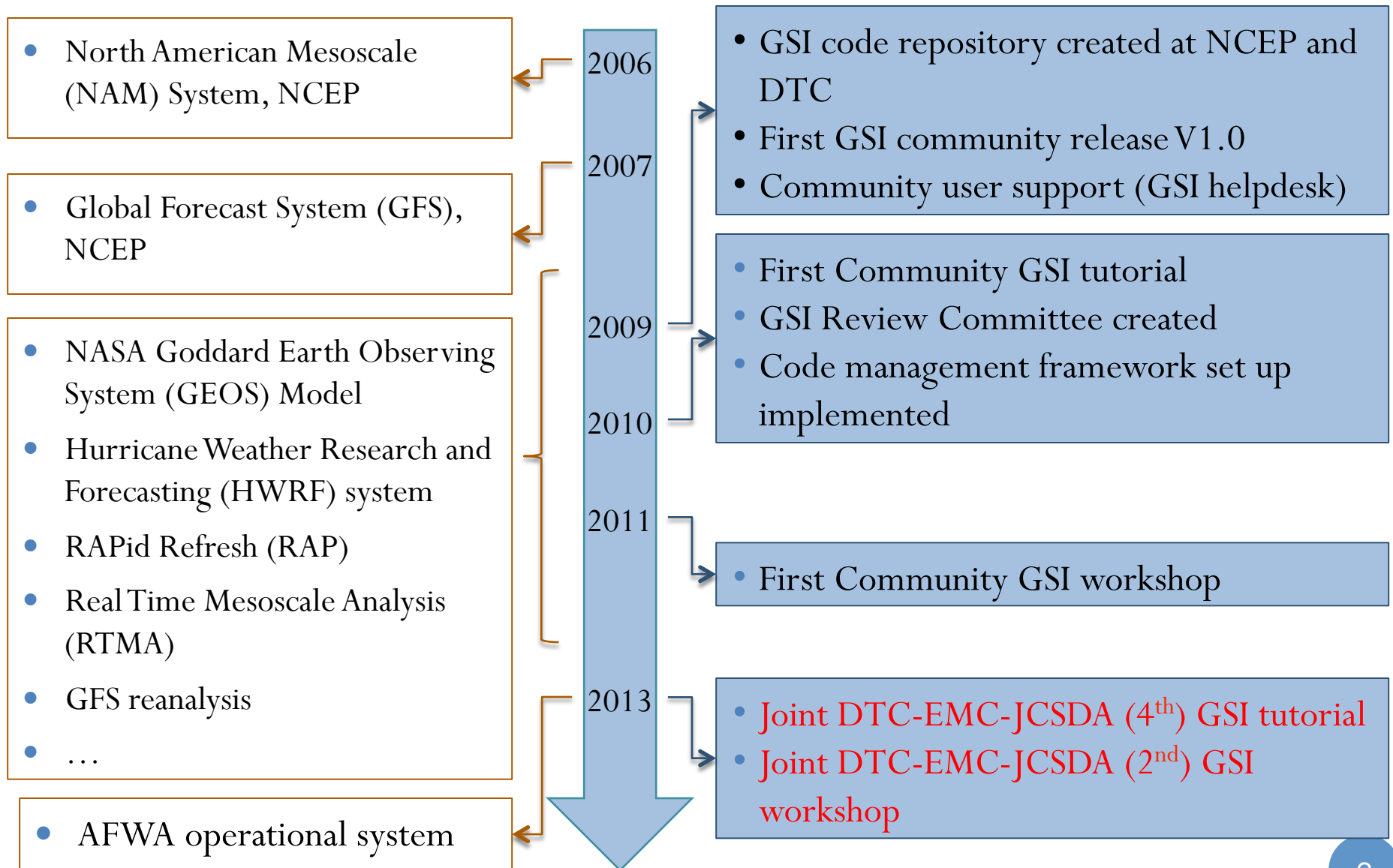
August 5-7, 2013, College Park, MD

DTC
Developmental Testbed Center

"History" of GSI (Community Service)

- North American Mesoscale (NAM) System, NCEP

- Global Forecast System (GFS), NCEP

- NASA Goddard Earth Observing System (GEOS) Model
- Hurricane Weather Research and Forecasting (HWRF) system
- RAPid Refresh (RAP)
- Real Time Mesoscale Analysis (RTMA)
- GFS reanalysis
- …

- AFWA operational system

2006

2007

2009

2010

2011

2013

- GSI code repository created at NCEP and DTC
- First GSI community release V1.0
- Community user support (GSI helpdesk)

- First Community GSI tutorial
- GSI Review Committee created
- Code management framework set up implemented

- First Community GSI workshop

- Joint DTC-EMC-JCSDA (4th) GSI tutorial
- Joint DTC-EMC-JCSDA (2nd) GSI workshop

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Who Made This Happen?

DTC
- Hui Shao
- Don Stark
- Ming Hu
- MaryBeth Zarlingo

EMC
- Bill Lapenta
- John Derber
- Andrew Collard

JCSDA
- Lars Peter Riishojgaard
- Sid Boukabara
- James G. Yoe
- Rene Brown
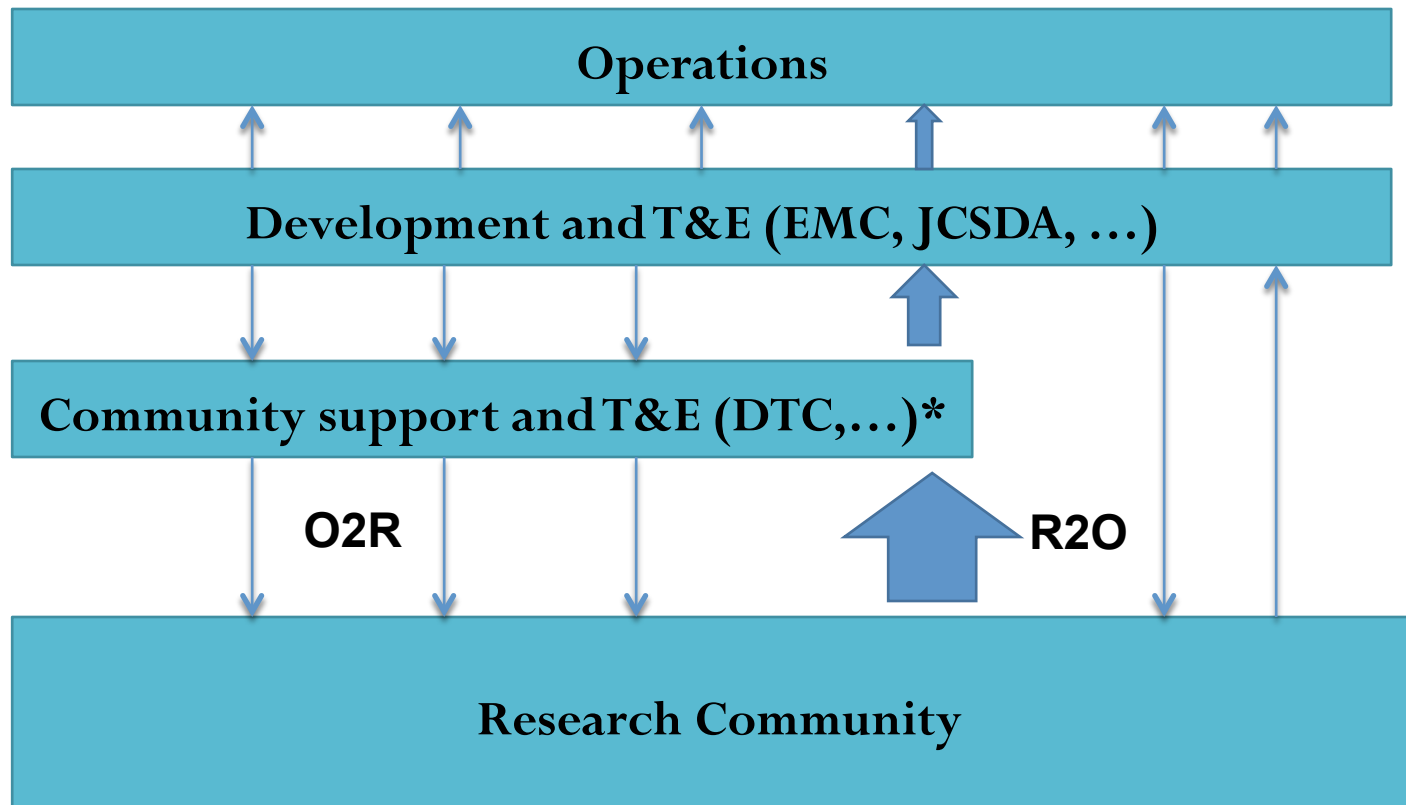- Ana Carrion
- Wan-chun Chen

NCO

Anne Arora, Doug Fenderson, Jason Rickett, Joey Mincey

And more…

Thank you!

# DTC: Provide community support and help accelerate research transition

Operations

Development and T&E (EMC, JCSDA, …)

Community support and T&E (DTC,…)*

O2R   R2O

Research Community

- **DTC GSI helpdesk receives ~30 emails/month inquires regarding GSI**

GSI registered community users: 777

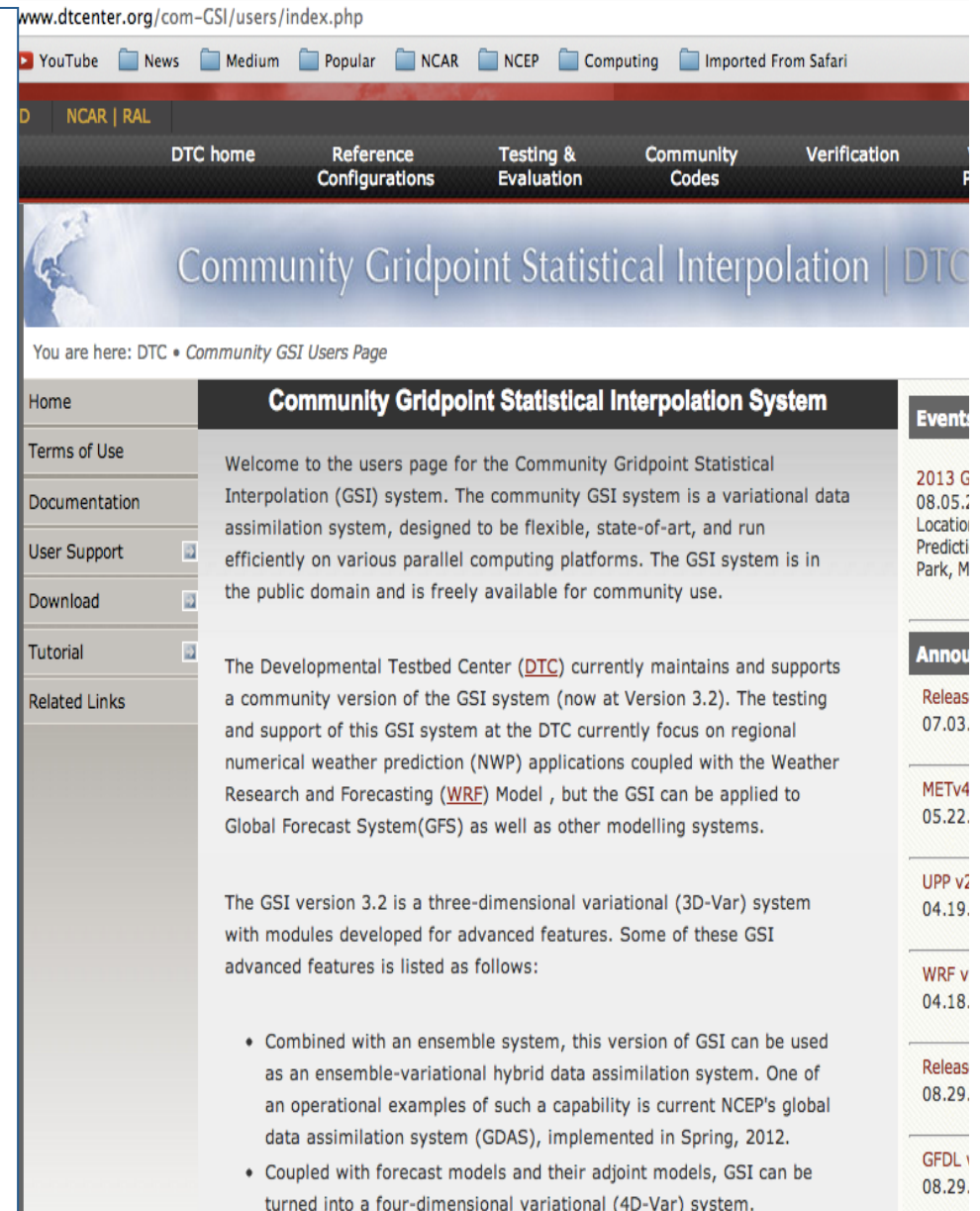University: 451 (58%), Government: 179 (23%)
Private Companies: 50 (6%), Non-Profit Comapanies: 97 (12%)

1695 places mapped @ 11:02 pm EST Aug 2
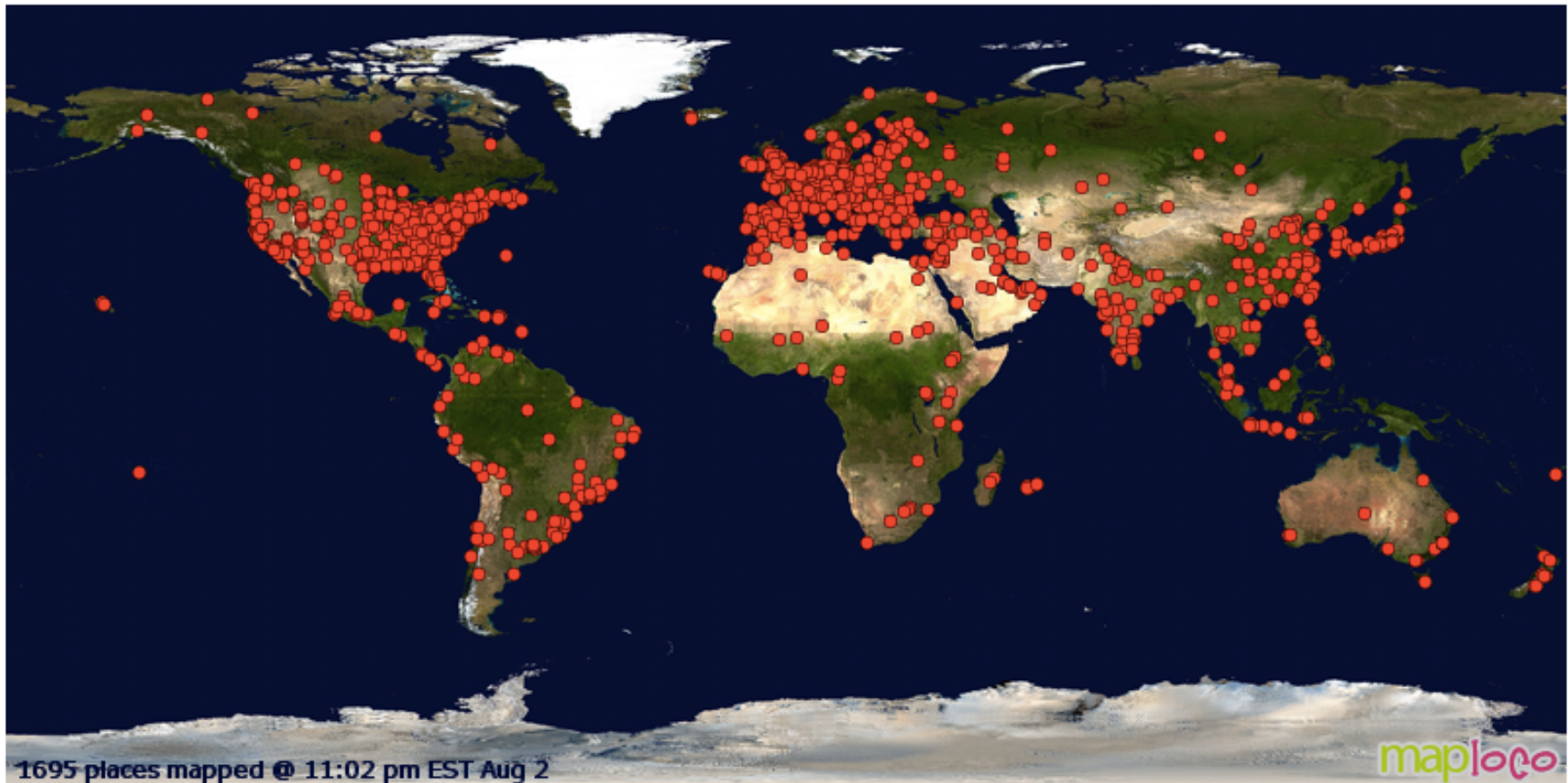
Map of the DTC GSI Users Webpage visitors

DTC GSI Users Webpage: http://www.dtcenter.org/com-GSI/users/

- Documentation
  - Users Guide
  - Workshop/tutorial presentations
  - Code browser
- Users Support
  - Known issues
  - FAQ
  - Helpdesk (gsi_help@ucar.edu)
- Download
  - Annual released code (GSI code, libraries)
  - Testing data
  - Practical cases
- Tutorial
  - Online
  - Residential
- Related Links (e.g., EMC GSI webpage)

Dual GSI Code Repository Structure (2013)

All code changes are committed to the EMC ops. trunk first

Branch

GFS   **Branch**   **NAM**   **Branch**   **Branch**

EMC Operational GSI repo.

Branch

Branch   **Code release**   **Branch**   **Branch**

DTC Community GSI repo.

Use local tags or branches for release, new development, bug fix

DTC community trunk is synced with the EMC ops. trunk
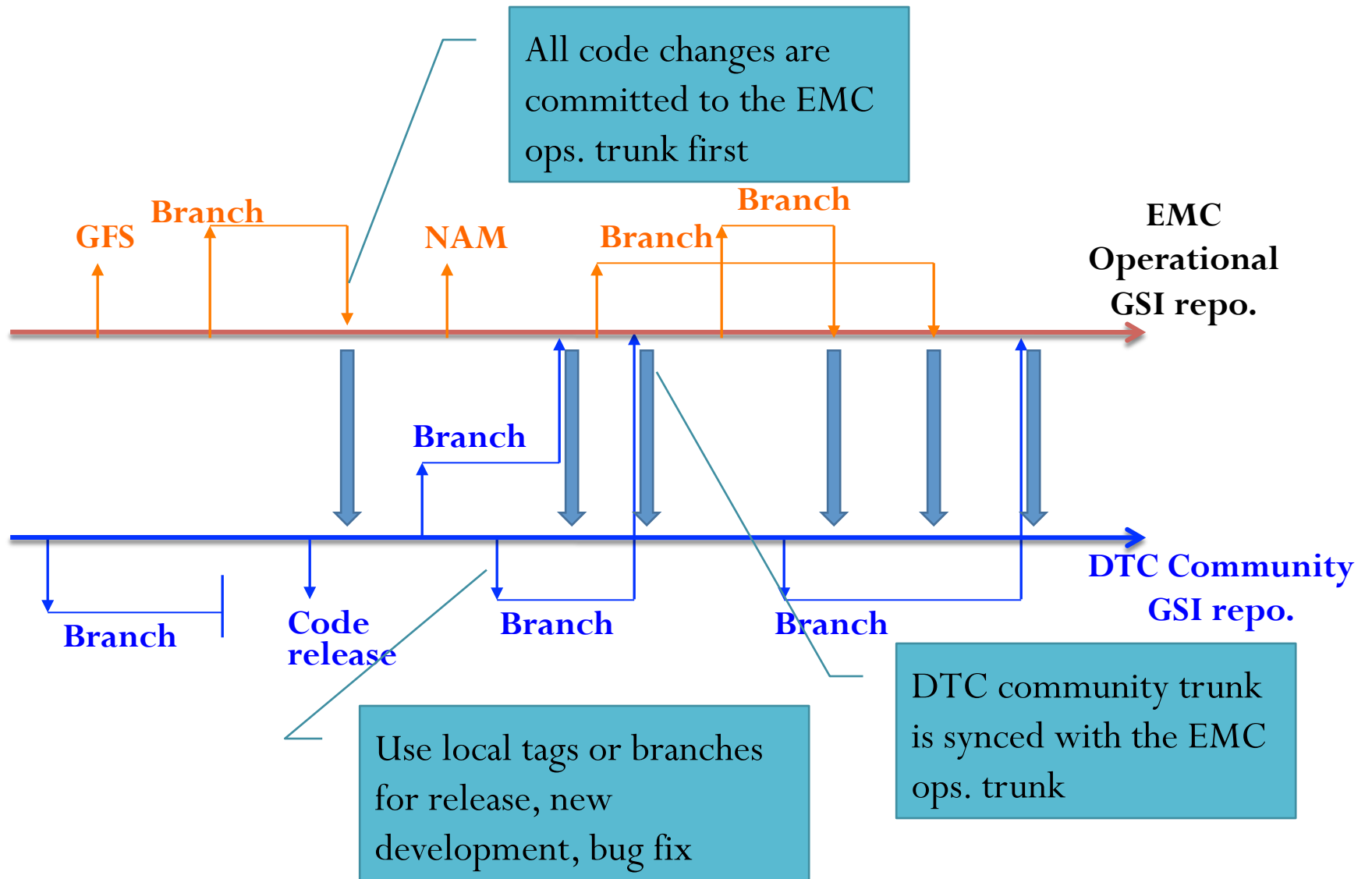
What is the difference between two repositories?

The DTC community repository is not only a mirror of the EMC operational GSI repository, but is also used to maintain

- an automatic multiplatform compiling system
- community tools (scripts, reading and diagnostics programs…)
- GSI required libraries

✓ Why are there two repositories?
   Mostly due to security concern. Also because community users require more than just GSI source code. DTC, EMC and other GSI partners are working together so no worries please.

✓ Which GSI should I use ?
   There is no "DTC GSI", "EMC GSI" or "global GSI". There is only one evolving GSI.

   For a researcher, community release should be sufficient to use. If you are interested in getting new development back to the GSI trunk, contact GSI helpdesk (gsi_help@ucar.edu) or EMC get access to the developmental version of GSI.

Code Management: GSI Review Committee

Chairperson

| DTC | NCEP/ EMC | NASA/ GMAO | NOAA/ ESRL | NESDIS | NCAR/ MMM | AFWA |

Special member
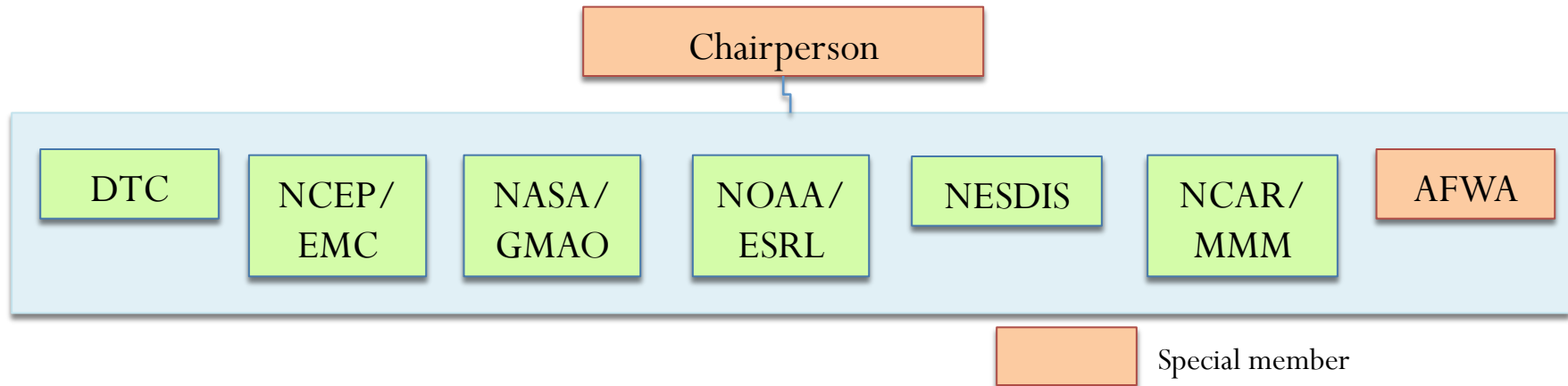
Members:
- Actively involved in the GSI development and support work;
- Commit time and effort to being involved in full functions of the committee.
- Each member group has only one formal representative (committee member) in the Committee and one valid vote regarding GSI related issues.

Special members:
- Those who are or will be actively involved in GSI efforts but do not match the criteria for full membership;
- Do not have veto power but can participate in Review Committee meetings regularly.
- ✓ As pat of its users' support duty, DTC represents general community users/developers.

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GSI Review Committee (2013)

Hui Shao

Hui Shao	John Derber	Ron Gelaro/ Ricardo Todling	Stan Benjamin	Brad Pierce/ Jim Jung	Thomas Auligne	Steve Rugg/ Jason Martinelli

Special member
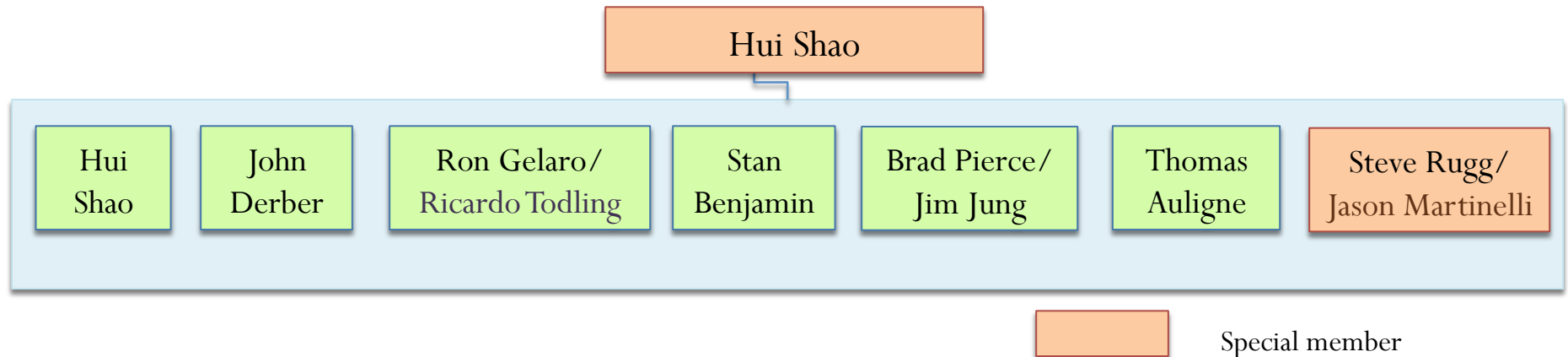
1) Coordination and Advisory (First meeting on Sept 30, 2010)
- Propose and shepherd new development
- Coordinate on-going and new development
- Process management
- Community support recommendation

2) GSI Code Review (First trial on Nov 10, 2010)
- Establish and manage a unified GSI coding standard
- Establish and manage a process for proposal and commitment of new developments to the GSI repository.
- Review proposed modifications to the code trunk.
- Make a decision on whether code change proposals are accepted or denied.

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GSI R2O Transition Procedure
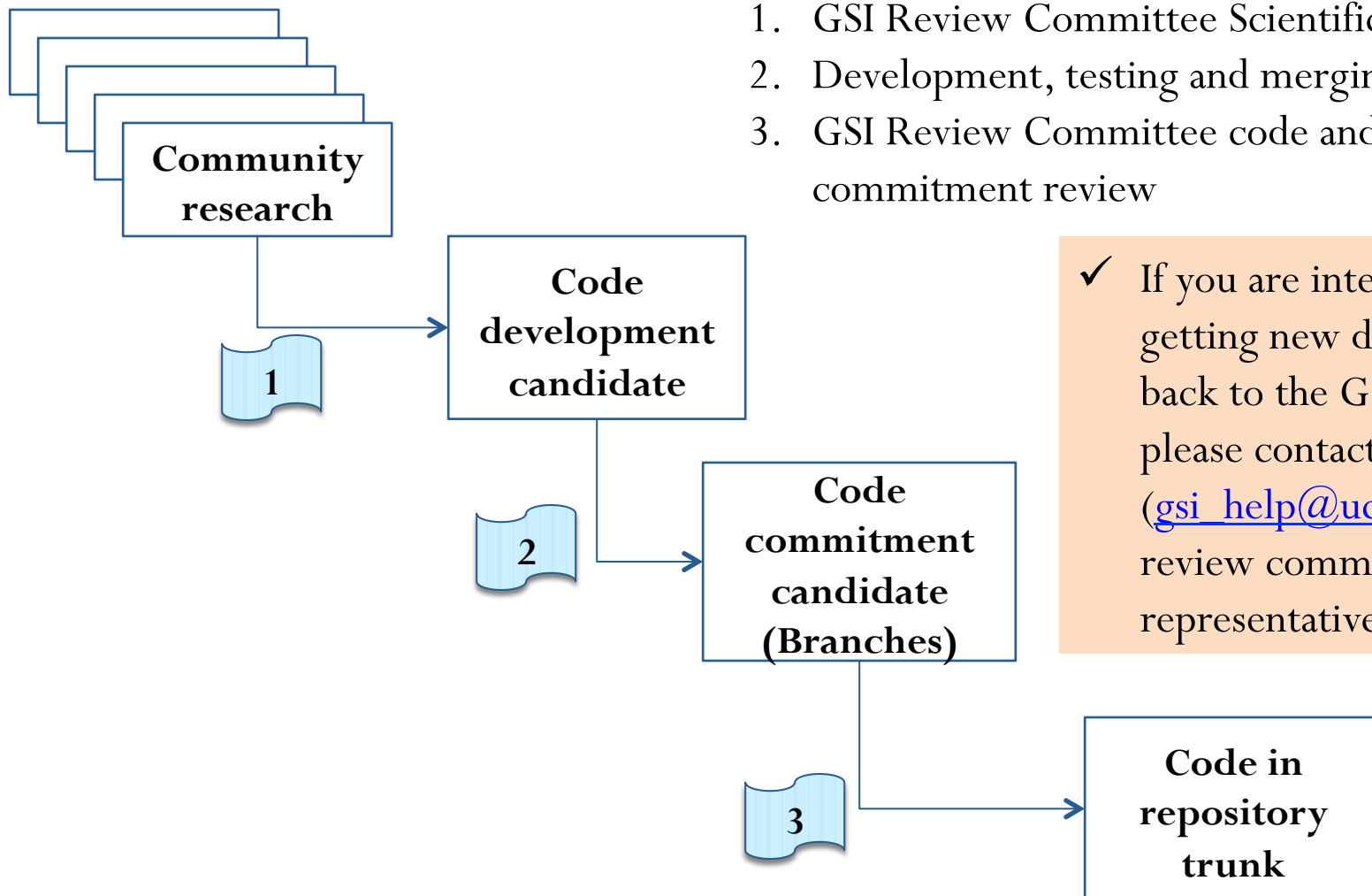
1. GSI Review Committee Scientific Review
2. Development, testing and merging
3. GSI Review Committee code and commitment review

Community research

Code development candidate

1

Code commitment candidate (Branches)

2

Code in repository trunk

3

✓ If you are interested in getting new development back to the GSI trunk, please contact GSI helpdesk (gsi_help@ucar.edu) or any review committee representative.

Tutorial Agenda: Lectures

Monday, 5 August
Fundamentals of Data Assimilation
Overview of GSI
GSI Fundamentals (1): Setup and Compilation
GSI Fundamentals (2): Run and Namelist
Introduction to Practice Session

Tuesday, 6 August
Observation processing
Background & Observation Error
Community Radiative Transfer Model (CRTM)
Radiance data assimilation
GSI Fundamentals (3): Diagnostics

Wednesday, 7 August
GSI Hybrid Data Assimilation
Aerosol Data Assimilation
Active Sensor Observation Data Assimilation
GSI Infrastructures
GSI Fundamentals (4): Applications

Invited Speakers

- University of Maryland
  - Kayo Ide

- NCEP/EMC, NESDIS, JCSDA
  - John Derber
  - Jeff Whiting
  - Wanshu Wu
  - Paul Van Delst
  - Andrew Collard
  - Daryl Keist
  - Li Bi

- DTC
  - Hui Shao (NCAR, EMC visitor)
  - Ming Hu (NOAA/ESRL)
  - Don Stark (NCAR)

- NCAR
  - Zhiquan Li

- NASA
  - Ricardo Todling

Some Notes

- **Practical sessions** are held in the afternoon of Mon-Wed, conference room (cross Atrium)

  - Registrants may need to pair up (20 computers). It might be ok to use your own computers. Please bring it if you have one.
  - Please get token for the computer accounts and return the token at the end of the Wed practical session. Student accounts will be closed after Wed.

- **Presentations** are available at
  http://www.dtcenter.org/com-GSI/users/docs/tutorial_presentations_2013.php

- **Group Picture:** Monday Morning Break, 10:30 am, Today!