SEE-GRID eInfrastructure for regional eScience

www.see-grid-sci.eu

The 2nd workshop on High Performance Computing
IPM and Shahid Beheshti University, Tehran, Iran
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The SEE-GRID-SCI initiative is co-funded by the European Commission under the FP7 Research Infrastructures contract no. 211338

The project

- **Contract n°:** RI-211338
- **Project type:** I3
- **Start date:** 01/05/2008
- **Duration:** 24 months
- **Total budget:**
- 3 214 690 €
- **Funding from the EC:**
- 2 500 000 €
- **Total funded effort, PMs:** 676.5
- **Web site:** www.see-grid-sci.eu
- **Contact person:** Dr. Ognjen Prnjat, GRNET

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The partnership

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Contractors

GRNET	Greece
CERN	Switzerland
SZTAKI	Hungary
IPP-BAS	Bulgaria
ICI	Romania
TUBITAK	Turkey
ASA/INIMA	Albania
UoBL	Bosnia-Herzegovina
UKIM	FYR of Macedonia
UOB	Serbia
UoM	Montenegro
RENAM	Moldova
RBI	Croatia
IIAP-NAS-RA	Armenia
GRENA	Georgia

Third Party / JRU mechanism used

associate universities / research centres

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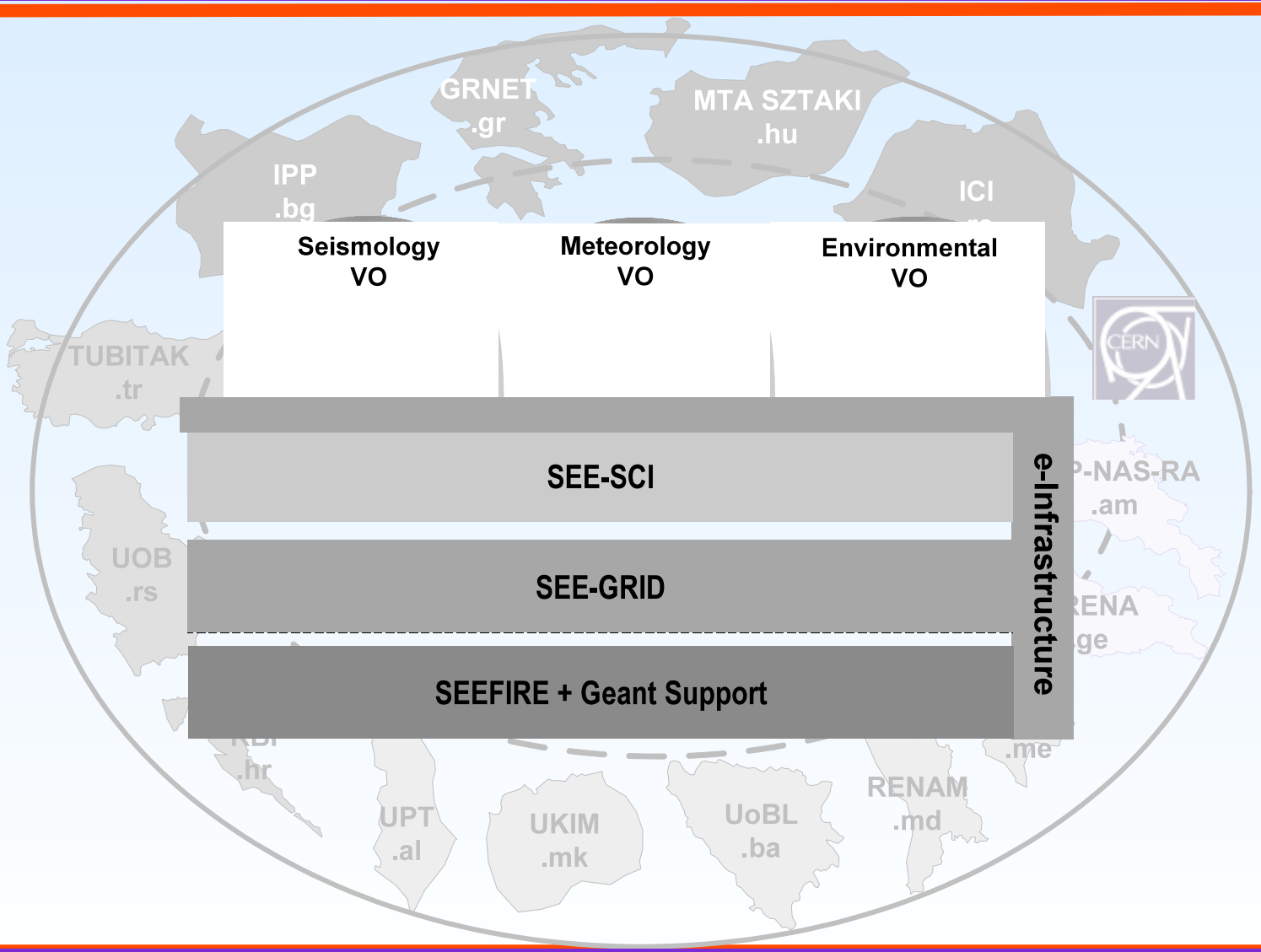
Vision: converged communication and service infrastructure for SEE



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Project objectives

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- Engaging international user communities (meteorology, seismology, environmental protection) and providing application-specific service extensions
- Providing infrastructure for new communities
- Consolidating actions towards long-term sustainability and European Grid Initiative inclusion
- Strengthening the regional and national human network

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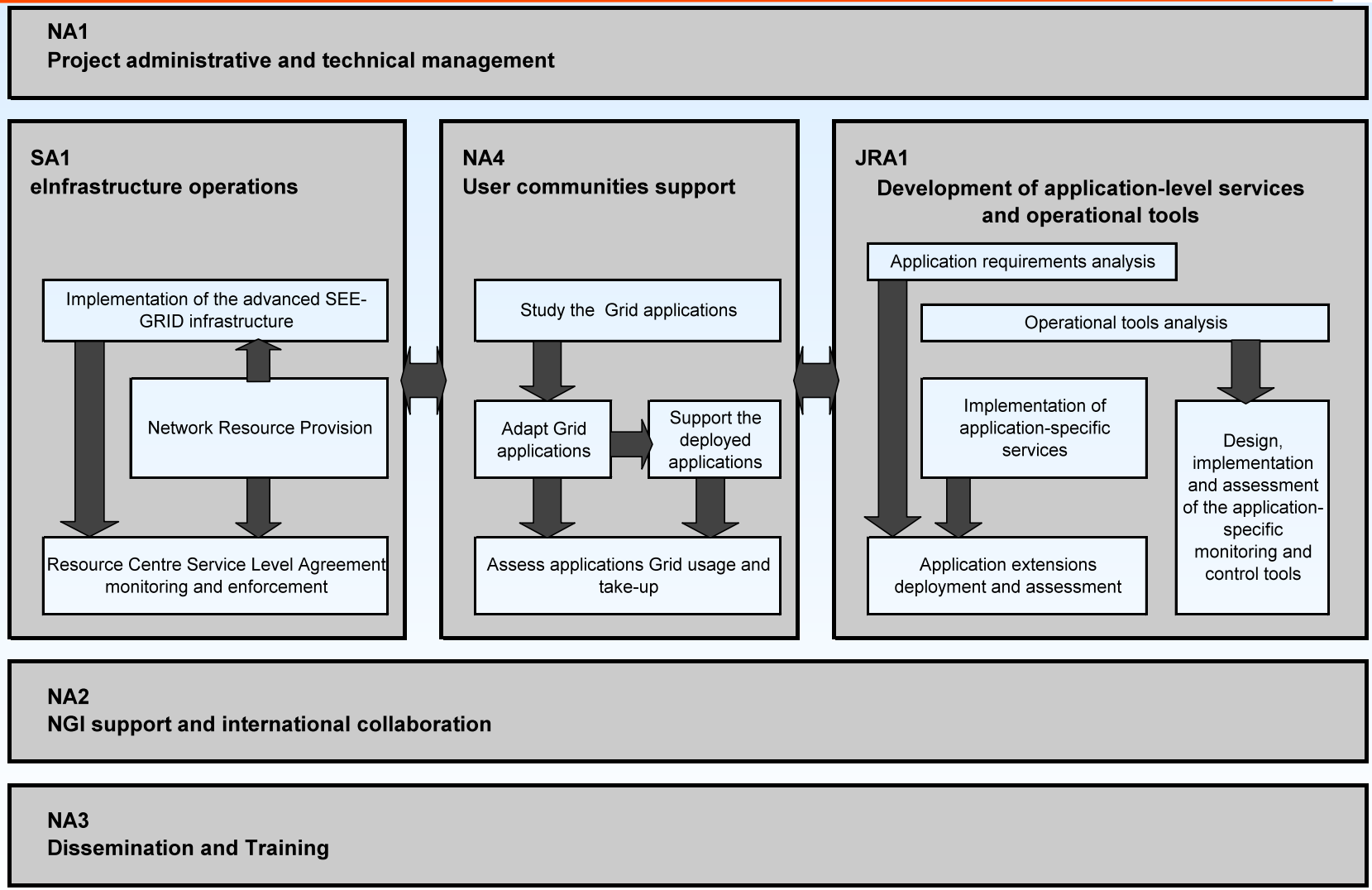
Work organization - PERT



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Grid infrastructure

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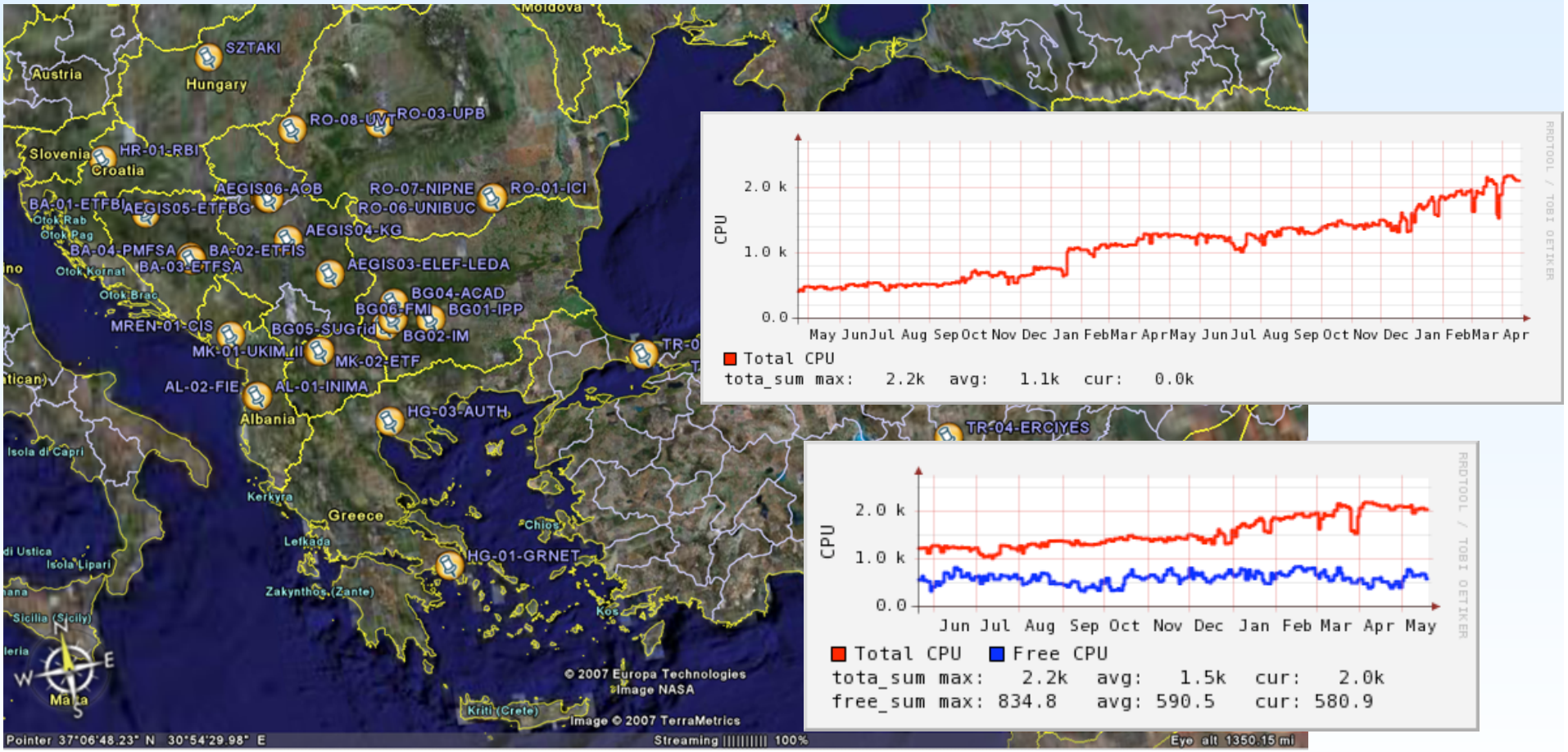
- Current infrastructure: 14 Countries, 35 sites, ~2200 CPUs, ~57TB storage
- Dedicated CPU evolution for target VOs: 700 (M01) – 1300 (M24)



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Infrastructure operations

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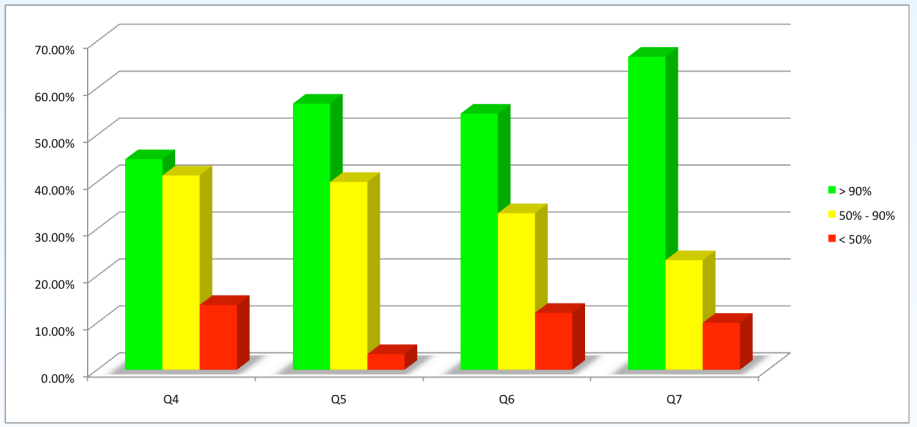
- Catch-All Certification Authority + National CAs
- Operational tools:
- Static Database: HGSM (Hierachical Grid Site Management)
- Monitoring
  - SAM (+SQL port), GStat, GridIce, Googlemap/earth, MonaLisa, Real Time Monitor, Nagios, Pakiti
- Ticketing system (ops and user support): OneOrZero
- Accounting: RGMA and accounting portal
- Operations wiki
- Portal

- Fully interoperable with EGEE, overlapping
- SLA definition, monitoring and enforcement and corrective actions



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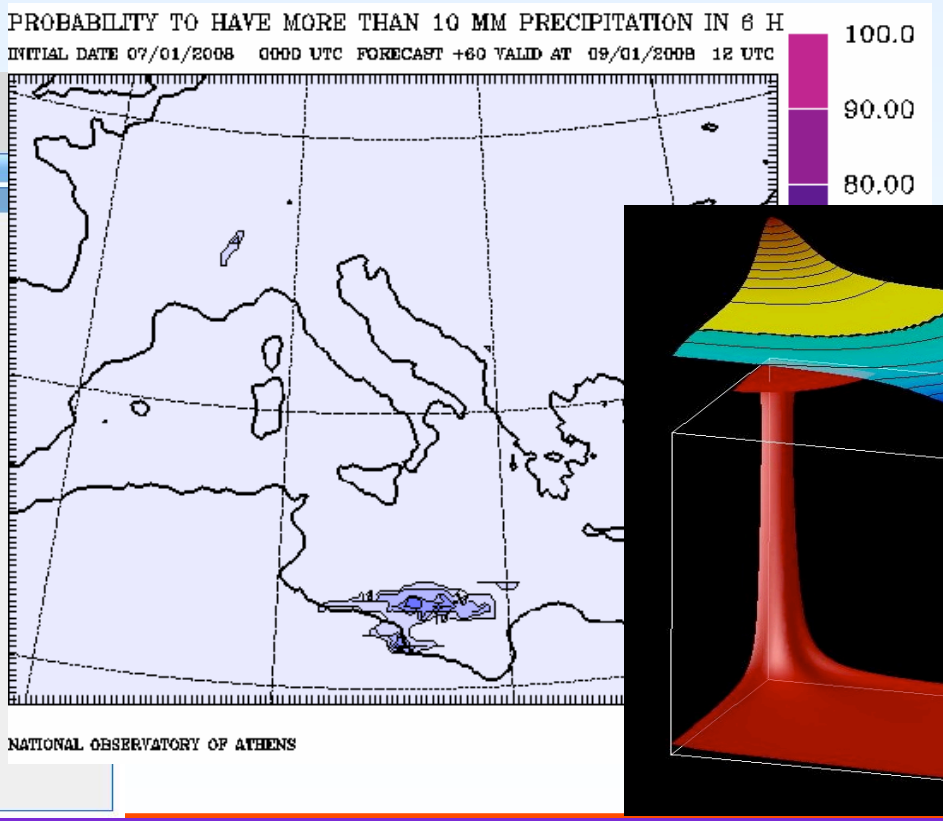
User communities

- Seismology (5 major applications), meteorology (2) and environmental protection (5)
- Cross-border user communities and beneficiaries



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Seismology VO

- Seismology VO will offer the researchers:
  - Access to seismic data mirrored from national research centers on a timely basis
  - Adequate computing resources close to the seismology data repositories
  - Collaborative working environment with both regional groups and global organizations
- Core: seismic data server serving large seismic data sets from sensors (order of TBs)
- Main components:
  - Mirroring and archival of data from various sources
  - Interface to archived data at the programming level
  - Operational Tools (monitor data access, data access statistics)

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Meteorology VO

- 1. Regional Multi-model, Multi-analysis Ensemble Prediction System
  - BOLAM, MM5, NCEP/Eta, and NCEP/WRF-NMM
  - SEE-wide scale detailed forecasts
  - Coordinate, collect and analyze the outputs from all models for the generation of probabilistic forecasts over the area of central and eastern Mediterranean
- 2. Study of interaction of airflow with complex terrain

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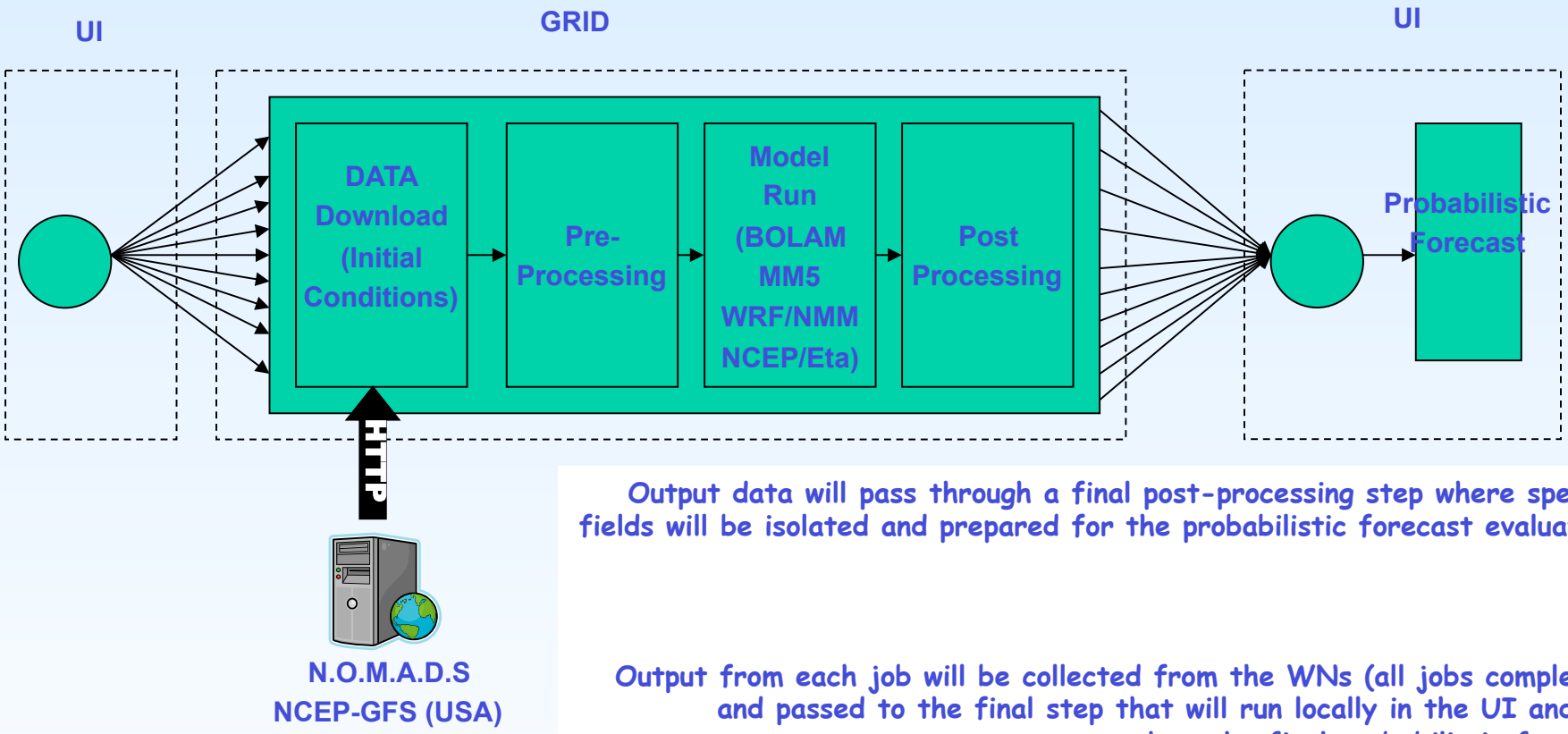
Meteorology VO: Ensemble forecasting



Output data will pass through a final post-processing step where specific fields will be isolated and prepared for the probabilistic forecast evaluation.

Output from each job will be collected from the WNs (all jobs completed) and passed to the final step that will run locally in the UI and will produce the final probabilistic forecast

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Environmental VO

- 2 main application domains:
  - Environmental protection/response and geomagnetism
  - Environment-oriented satellite image processing
- 5 core applications:
  - Modeling System for Emergency Response to the Release of Harmful Substances in the Atmosphere
  - Multi-scale atmospheric composition modeling
  - Monte Carlo Sensitivity Analysis for Environmental Systems
  - Regional Modeling of the Geomagnetism
  - Environment Oriented Satellite Data Processing + related applications

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Development / JRA: Service add-ons

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- Objectives:
  - Capture commonalities across scientific fields in terms of application requirements on Grid middleware
  - Define development areas for middleware plug-ins and application-level services
  - Implement these
- Candidate areas: data access and management, multidimensional visualization and interactivity
- 2 services per Virtual Organization

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Development / JRA: Operational tools extensions

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- Objective: Analyse application-focused features of operational tools and develop new or extend existing tools
- Tools that collect data relevant to the operations of the infrastructure from the point of view of application developers and users
  - To be made available to operators and users from a web-service based front-end
- Tools that automate operational tasks and procedures which are particularly related to deployment and running of applications

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Horizontal actions: NGIs

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- Structuring NGIs in all countries in the region
  - Achieve stable and well-established organization and operations, as well as government recognition
  - Stimulate kick-off of national-level Grid projects
  - Secure membership of all non-EGEE countries in relevant European Grid bodies
- Provide active support for NGI establishment in other developing regions

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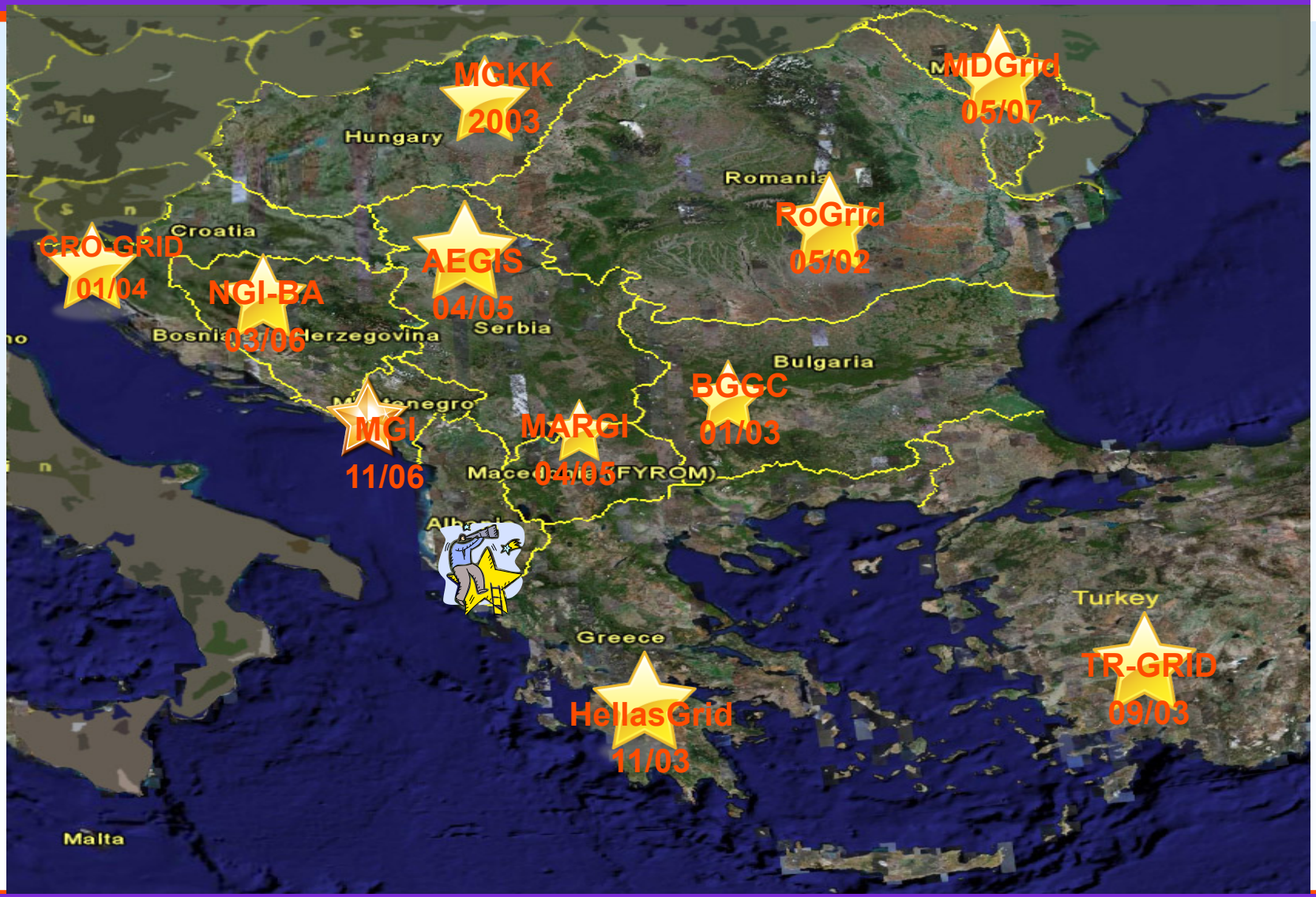
NGI status



Before SEE-GRID-2

During SEE-GRID-2

Planned for 2nd Year

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Horizontal actions: training and dissemination

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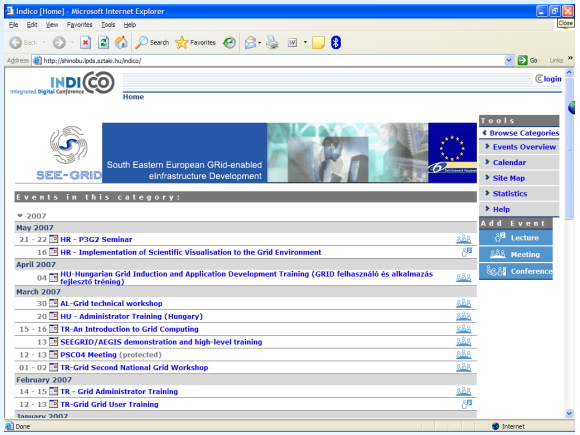
- Dissemination Event Agenda:
  - project website see-grid-sci.eu
- Training Event Agenda
  - Training portal http://www.lpds.sztaki.hu/stc



- Trainings: generic Grid and VO specific
- tInfrastructure: 7 sites, 60 CPUs, core services, mock CA
- A pool of 38 SEE-GRID-wide trainers, growing
- Harmonization of the training material
- Training material repository
- Training materials in local languages

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Conclusion: path towards sustainability

- **SEEREN1/2:** establishing the regional inter-NRN interconnectivity and GEANT links
- **SEEGRID1/2:** building the regional Grid infrastructure within and beyond EGEE
- **SEEFIRE:** studying the feasibility of long-term solutions for dark fiber backbone in the region
- **SEELIGHT:** implementation of the lambda facility in the region
- **BSI:** Caucasus region connections
- **SEE-GRID-SCI:** eInfrastructure for large-scale environmental science: meteorology, seismology, env. protection. Inclusion of Caucasus.
- **SEERA-EI:** regional programme managers collaboration towards common eInfrastructure vision and strategy

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Conclusion: The regional strategy

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- Vision:
  - Being on the technological par with the rest of Europe
  - Enabling local scientists to use their potential
  - Role-model for regional developments
  - Leading the way in wider contexts
- Strategic success metrics of regional initiatives:
  - not Gbps/sec; number of nodes; TBs of storage
- The initiatives are puzzle pieces of RTD efforts to sustain regional development
  - Increasing the retention of talented scientists in the region
  - Pursuing joint R&D efforts among countries in the region
  - Making available the benefits of the Information Society for citizens
  - Easing the digital divide between the region and rest of EC
  - Improvement of regional competitiveness in all market sectors
  - Regional political stability and cohesiveness

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