

## **GI SELA: ANOTHER STEP TOWARDS THE LONG-TERM SUSTAINABILITY OF E-INFRASTRUCTURES IN LATIN AMERICA**

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*ICN-UNAM (Mexico City - Mexico)*



## EELA (Jan. 2006 – Dec. 2007)

- Build a bridge between consolidated **e-Infrastructure initiatives** in Europe and emerging ones in Latin American
- Create a collaboration network to deploy a **large portfolio of scientific applications** on a well supported Pilot Test-bed
- Carry in parallel of the **training in grid technologies** and of the knowledge dissemination and outreach

## EELA-2 (Apr. 2008 – March. 2010)

- Provide an empowered Grid Facility with versatile services fulfilling application requirements
- Ensure production quality services
- Ensure the long term sustainability of the e-Infrastructure beyond the term of the project
- Expand the current EELA e-Infrastructure
- Look for new communities outside academia (Industry and Business)

## EELA (SSA under EU FP6)

*E-infrastructure shared between Europe and Latin America*

- EC support: 1.7 M€
- CIEMAT extra support: 0.4 M€
- 10 Countries (7 in LA)
- 2 International Organisation: CLARA & CERN
- 20 Members (13 in LA)

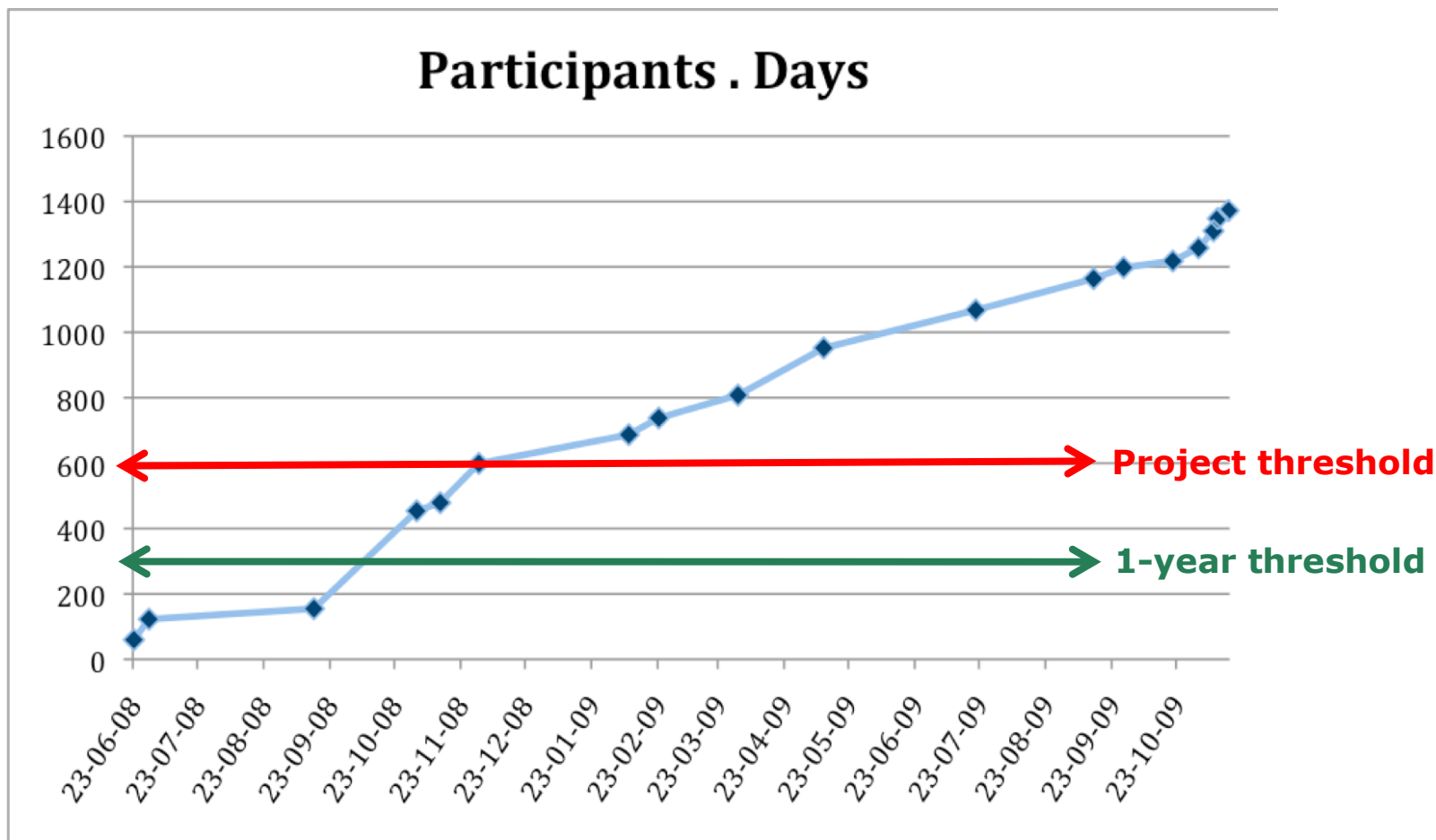
## EELA-2 (CP-CSA under EU FP7)

*E-science grid facility for Europe and Latin America*

- EC support: 2.1 M€
- CETA-CIEMAT extra funds: 0.3 M€
- 16 Countries (11 in LA)
- New countries: Colombia, Ecuador, Panama & Uruguay – France & Ireland
- 1 International Organisation (CLARA)
- 78 Members (62 in LA)
- 32 Institutions joined during the project lifetime (31 in LA)
- 13 JRUs (9 in LA) including 4 new JRUs (3 in LA)

## NA2 = Dissemination & Training

**Much more training effort delivered than pledged**





**FP7 INFRA-2010-2 call - Topic INFRA-2010-1.2.3: Virtual Research Communities**

**Start date: 01/09/2010 - Duration: 24 months**

**Project type: CP-CSA      Grant agreement N°: 261487**

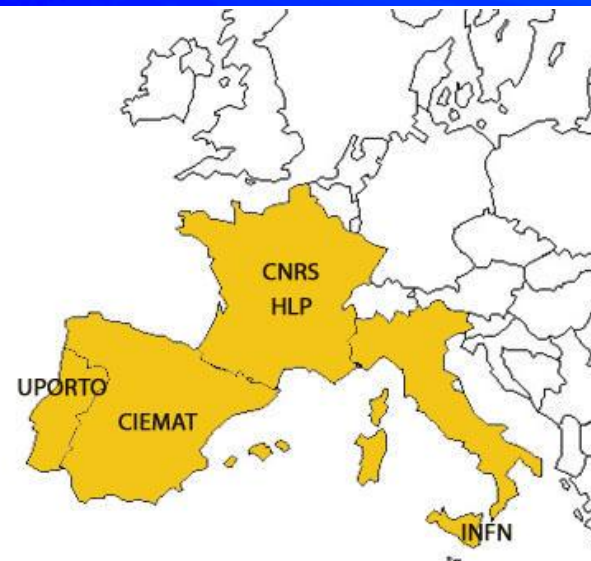
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15 Countries (11 in Latin America)

19 Partners (14 in Latin America)



Negotiation with Bolivia & Paraguay for possible collaboration



## Europe

Italy	INFN – Catania
France	CNRS, HLP
Portugal	U.PORTO
Spain	CIEMAT (Coord. Institution)

## Latin America and the Caribbean

Argentina	INNOVA-T
Brazil	UFRJ, UFCG
Chile	REUNA
Colombia	UNIANDES
Cuba	CUBAENERGIA
Ecuador	CEDIA
International	CLARA
Mexico	CUDI, UNAM
Panama	CIDETYS
Peru	RAAP
Uruguay	UdelaR
Venezuela	ULA

**Objective1:** Ensure the long-term sustainability of the e-Infrastructure inherited from EELA-2 in the Latin America and the Caribbean

**Objective 2:** Provide full support to the Virtual Research Communities spanning Latin America and Europe, using this e-Infrastructure.

## Work plan:

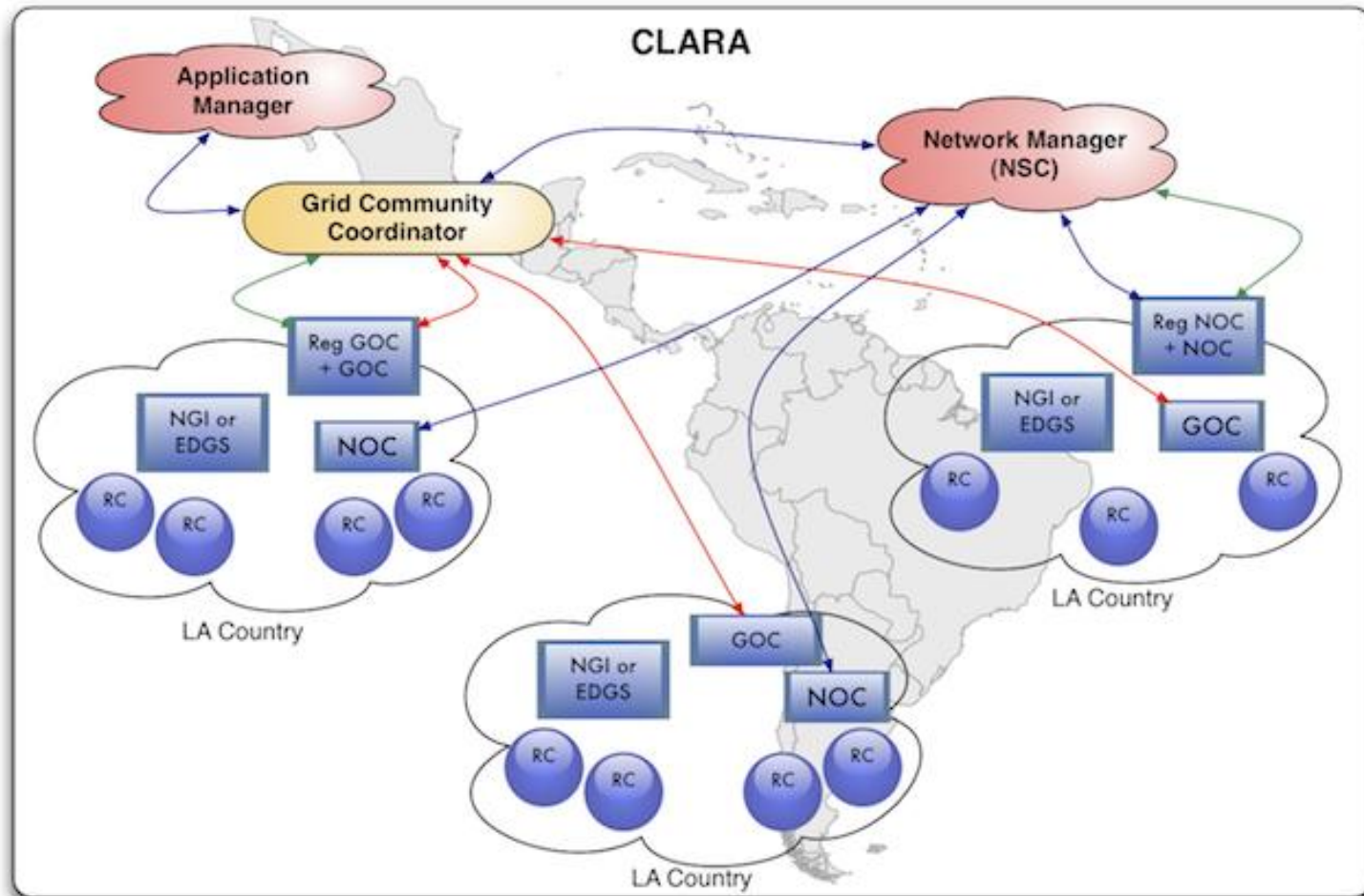
- Implement a sustainability model rooted on National Grid Initiatives (NGI), **in association with CLARA, Latin American NRENs and collaborating with EGI.**
- Provide the communities with the suited e-Infrastructure and Application-related Services required to improve the effectiveness of their research. This will address both:
  - ✓ **The former EELA-2 User Communities** whose research investigations are carried out at the Institution level or in small collaborations.
  - ✓ **The larger Virtual Research Communities** as Life & Earth Sciences, HEP



- **A concern since EELA-2 !**

- Sustainability model defined in EELA-2: <http://documents.eu-eela.org/record/1119/files/>
- Adaptation of the EGI model to the Latin American context
- 3-layer model: **Local** (Institution), **National** (Country) and **Regional** (Latin America & The Caribbean)
- Main idea: Get CLARA and Latin American NRENS involved in supporting Research e-Infrastructures on the long-term
- 1-year negotiation with CLARA : model modified, adapted and finally adopted during the preparation of the GISELA Proposal
- Responsibilities:
  - **Local**: Resource Centre Institutions
  - **National**: JRU, NGI or Equivalent Domestic Grid Structure (**EDGS**)
  - **Regional**: **IGALC** - **Iniciativa de Grid de America Latina – Caribe**: [www.igalc.org](http://www.igalc.org)

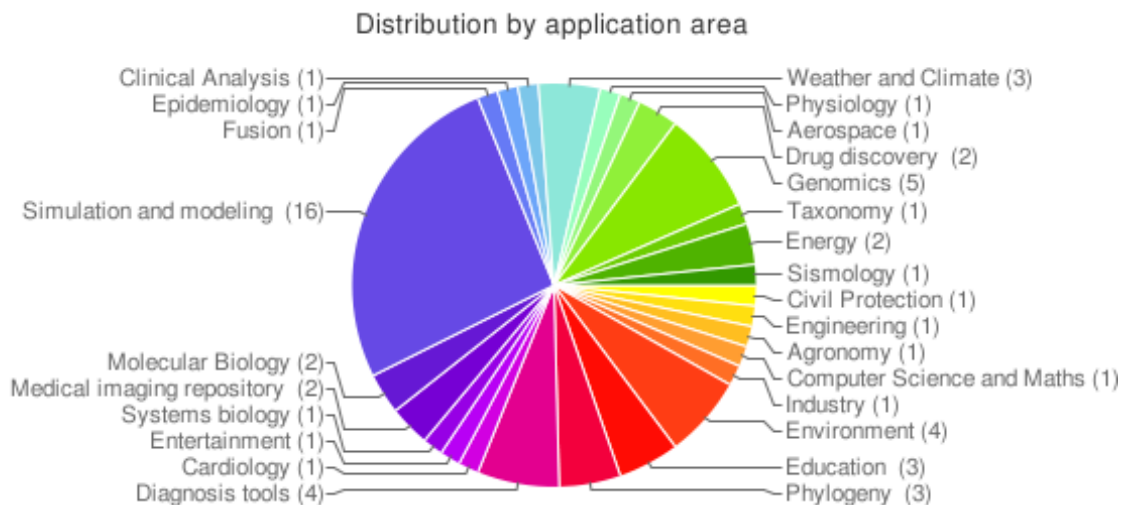
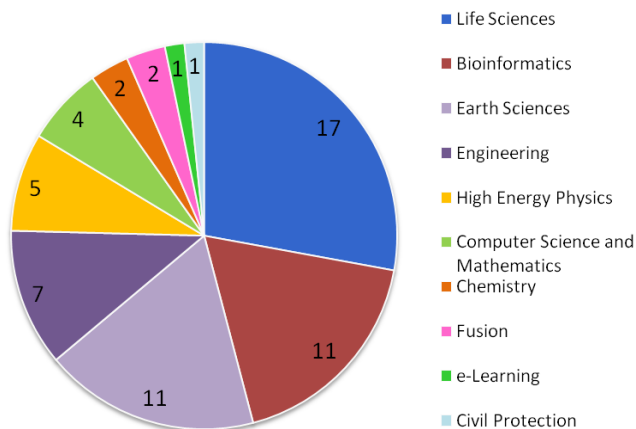
- The CLARA-GISELA model as defined in the GISELA DoW:
  - <http://documents.gisela-grid.eu/record/32?ln=en>



- **GISELA / IGALC shall provide and support basic (CORE) operation services. It will develop inter-operation agreement with EGI, GÉANT2, CLARA, the NRENs and the NGIs (or EDGS), in Europe and Latin America**
- **GISELA shall refine, with the CLARA Transition Team, the final model of sustainability for the e-Infrastructure best adapted to the CLARA and LA NRENs environment**
- **CLARA shall identify the NREN(s) that will be in charge of the Operation and Support of the e-Infrastructure, applying a business plan**
- **Over the course of GISELA, Grid knowledge and expertise shall be handed over to CLARA and the selected NRENs, via the Transition Team**
- **By the end of GISELA, CLARA and Latin American NRENs, NGIs or EDGS shall take over the operation of the e-Infrastructure and the support of the VRCs**

- One of the major concerns of EELA and EELA-2 was to constantly interact with User Communities to:
  - Disseminate Grid technology, provide training & technical support
  - Get back full support from User Communities on strategic and political issues
- Instruments
  - Tutorials, Grid schools, “Gridification” weeks, User Forum, Workshops, Conferences, etc.
  - In 2009, EELA-2 ([www.eu-eela.eu](http://www.eu-eela.eu)) collaborated to the realisation of the e-Infrastructure Survey of the eResearch 2020 Project ([www.eResearch2020.eu](http://www.eResearch2020.eu)). Its purpose was to “*investigate the utilisation of e-Infrastructures in Virtual Research Communities and to propose strategies to policy makers and the e-Infrastructure community to enhance the uptake and use of these technologies*”

- VRC situation in EELA-2:
  - EELA-2 ended up supporting **61** Applications from **78** Institutions



- EELA-2 User Communities were typically **1-2** Institution group(s), **largely located in Latin America**, alone or collaborating with a few Institutions. Their use of the Infrastructure was to learn Grid technology to evaluate its potential for their future research.
- A few **large** VRCs from HEP (Auger, LHCb, ALICE, CMS, ATLAS) were also supported

- **From the DOW**
  - “**WP3 (User Communities Support)** will interact with new VRCs to evaluate the technical requirements and impact of their Applications and to support their deployment. **WP6 (Infrastructure and Applications-oriented Services)** will contribute to the dissemination and use of the services it developed in EELA-2
  - **WP6** will interact with the VRCs to collaborate to the identification, development and deployment of integrated services (e.g. gateways)”
- **Will to adopt precise strategies on the short term**
  - **Bottom up strategy**
    - Get asap a few VRCs running production as intensively as possible on GISELA
    - Aim at saturating the e-Infrastructure
  - **Top down approach**
    - Contact VRCs by all means
    - Collaborate with EGI, CHAIN and other regional initiatives
    - Refine our VRC approach

- **Identification of VRCs to include**
  - Selected EELA-2 User communities
  - User Communities recruited by CLARA
  - More large VRCs from Earth, Life Sciences, HEP
  - Other possible VRCs from national initiatives, e.g. centres/poles of excellence
  - Industry partners, as from contacts taken through Chambers of Commerce (e.g. San Luis Potosi - Mexico)
- **Not clear: collaboration with ESFRI projects!**
- **Enrolling large VRCs, e.g.**
  - e-NMR / WeNMR: UFRJ (Brazil) group coming on board
  - Weather Research and Forecasting (WRF) for mass production
- **Progress with EGI and related projects**
  - Active participation at the "Regional Initiatives" session of the EGI Technical Forum (Amsterdam - 14<sup>th</sup> to 17<sup>th</sup> September 2010)
  - Proposal to organise a Workshop "Regional e-Infrastructures meet VRCs" to take place at the CHAIN KoM (Roma, December 2010)



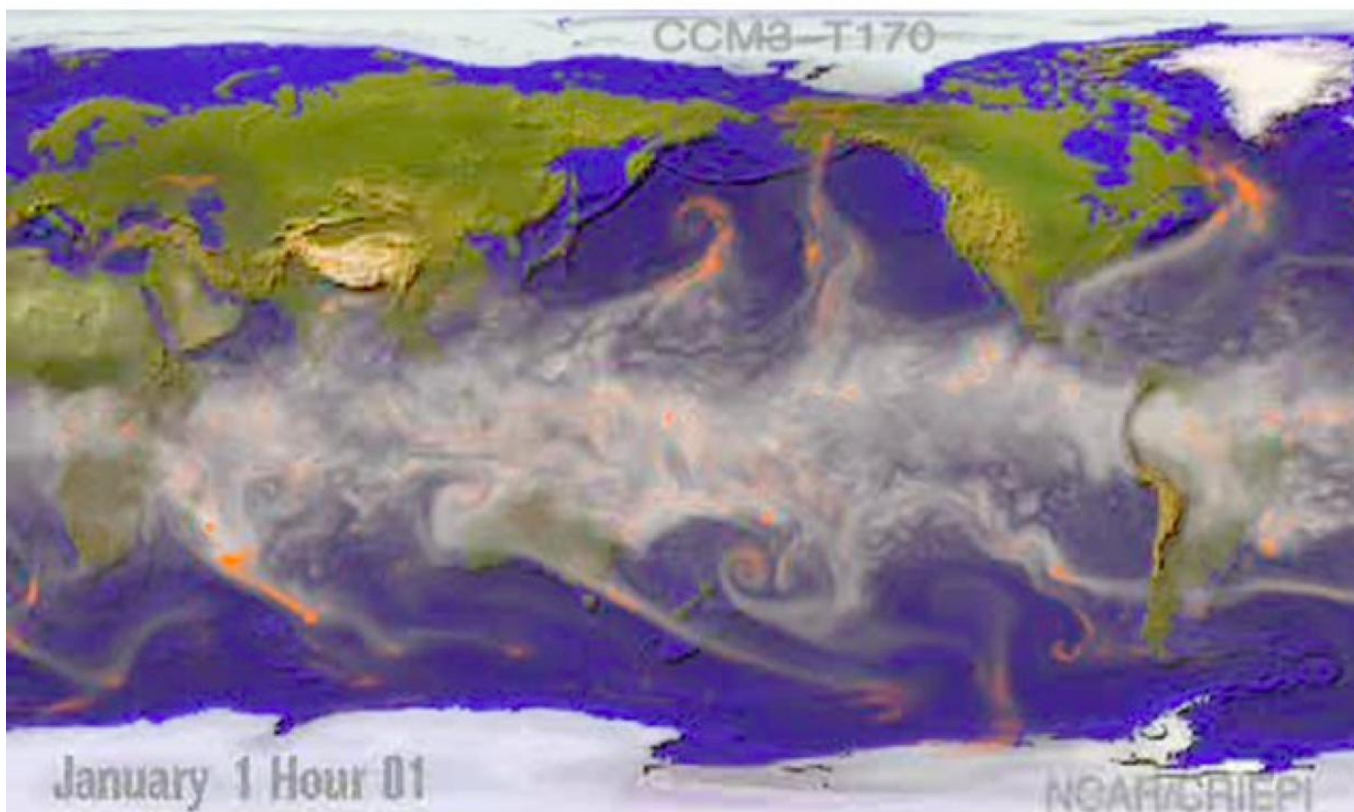
- **Ensure the proper access of GISELA users to the e-Infrastructure resources**
- **Support Application developers and users over the whole process from deploying an Application up to running it in production**
- **Organise the training best adapted to each VRC**
- **Support the use of the e-Infrastructure and Application-related Services already developed in EELA-2 and helps the users in the validation of these services in the context of their Application**
- **Participate in the development of new services requested by the VRCs and helps in the test and validation of these services for user's Applications**



## Weather predictions (UNICAN – Spain)

[http://applications.eu-eela.eu/application\\_details.php?l=20&ID=65](http://applications.eu-eela.eu/application_details.php?l=20&ID=65)

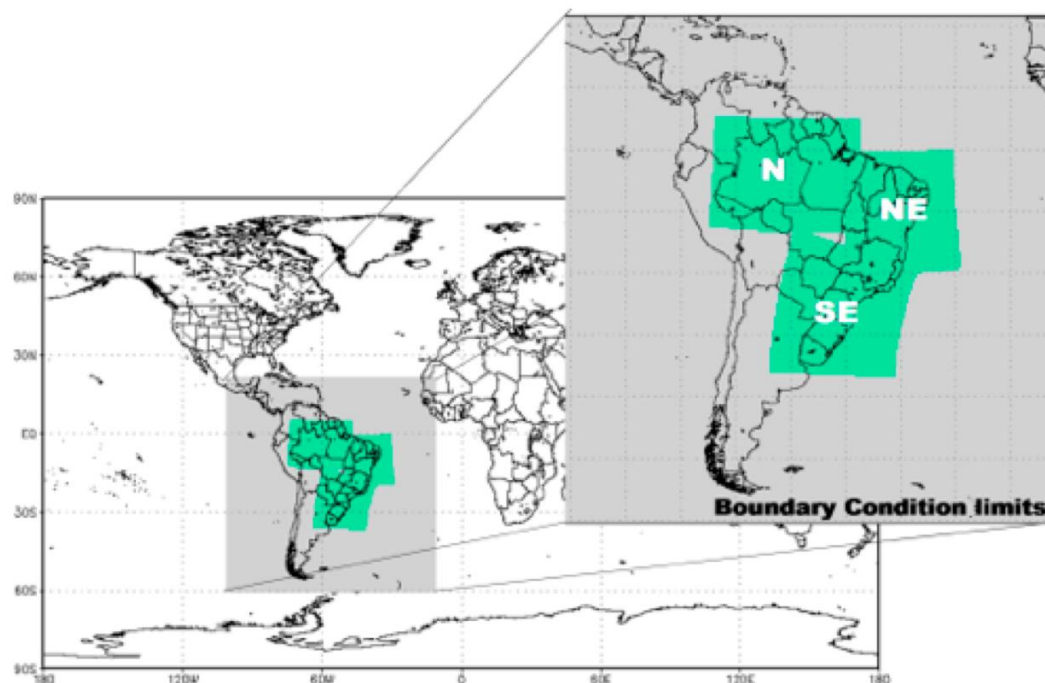
The Weather Research and Forecasting (WRF) Model ([www.wrf-model.org](http://www.wrf-model.org)) is a popular model used both operational forecasting and atmospheric research. It is well adapted to a broad spectrum of applications across scales ranging from kilometers to thousands of kilometers.



## Water resources management (UFCG – Brazil)

The SegHidro platform (<http://seghidro.lsd.ufcg.edu.br/>) cares of the **water resource management in Brazil**, in particular in the Northeast, a semi-arid region, where irregular rainfall distribution causes many problems to the population. It uses the BRAMS simulation model developed by INPE (Brazil's National Institute for Space Research) to **provide weather forecast and climate prediction** over a given area and period of time. As climatology simulations normally require a high computational effort due to the large amount of data that must be processed, they are conveniently run on Grid infrastructures.

**BRAMS is routinely used** - on either the GISELA infrastructure that runs **gLite** or on the opportunistic part that runs **OurGrid** - to process the regional climatology of the 3 areas shown. It provides workflows such as (i) **weather and seasonal climate forecasting**; (ii) **reservoir planning and operation**; (iii) **rainwater harvesting risk analysis**; (iv) **integrated surface and groundwater management**; (v) **operation of water distribution networks**; (vi) **agricultural planning**; (vii) **flood forecasting**; (viii) **soil conservation planning**; (ix) **and regional impact of climate change**.



## • WP1

- Insertion of twelve 3<sup>rd</sup> Parties in the Consortium (Amendment to the DoW being currently signed)
  - CEFET-RJ in Brazil
  - UFRO and UTFSM in Chile
  - PUJ and UIS in Colombia
  - CICESE, ITV, ITESM, IPN, UAEM and UNISON in Mexico
  - UMINHO in Portugal
  
- GISELA central role to develop collaborations with EGI and related projects:
  - Regional Initiatives - EGI Technical Forum (Amsterdam, The Netherlands, 14<sup>th</sup> - 17<sup>th</sup> September, 2010).
  - Launch Event (Rome, Italy, 14<sup>th</sup> December 2010) <http://agenda.ct.infn.it/conferenceDisplay.py?confId=495>
  - EGI / VRCs / Regional Initiatives Collaboration (Amsterdam, The Netherlands, 27<sup>th</sup> January, 2011)
    - *Outcomes that will serve as a basis of agreements for all the other Regional Initiatives (e.g CHAIN, SAGrid, DEGISCO,..) :*
      - Project MoU between GISELA and EGI.inSPIRE
      - Infrastructure MoU between UFRJ (on behalf of GISELA Partners) and EGI.eu

## • The CLARA Transition Team began to work with the GISELA WP managers

- **WP2**

- Decision Makers Meeting, held during the GISELA KoM at San Luis Potosí (Mexico), with Dr. Enrique Villegas Valladares, General Director of the Potosino Council of Science and Technology, and Dr. Felipe Pazos Flores, Chief of the UASLP Division of Informatics
- 2 Workshops co-organised (EPIHK and CHAIN) in Mexico (UNAM) and Chile (UTFSM)
- First GISELA Bulletin to be released on 28<sup>th</sup> February, 2011

- **WP3 (provided by Diego Carvalho – WP3 Manager)**
  - 4 Tutorials co-organised (EPIHK and CHAIN) in Mexico (UNAM) and Chile (UTFSM) and very intense activity towards VRCs identification and support. See the KoM presentation “*Involvement of VRCs in GISELA*” at <http://indico.gisela-grid.eu/conferenceOtherViews.py?view=standard&confId=8>
  - Current strategy
    - help site managers to get VRC VOs supported on their sites
    - help the LA scientific community to collaborate with VRCs
  - Outcomes
    - Life Science Virtual Research Community
      - VO: *WeNMR*
        - Sites in LA configured and providing computing resources
        - A Research group in Brazil (UFRJ) currently supported by GISELA
        - After the pilot support phase, new countries and research groups will be contacted in LA. Next candidate in Argentine
      - VO: *HealthGrid*
        - Initial contact with VO responsible
        - Green light: “*HealthGrid would be very pleased to support new BioMed partners from Latin-America as well as to help you to raise awareness and interest within this community*”
      - VO: *Biomed*
        - Gisela agreed to get LA sites supporting the VO
        - Biomed agreed to provide support and offered Workflow tools (MOTEUR / DIRAC)

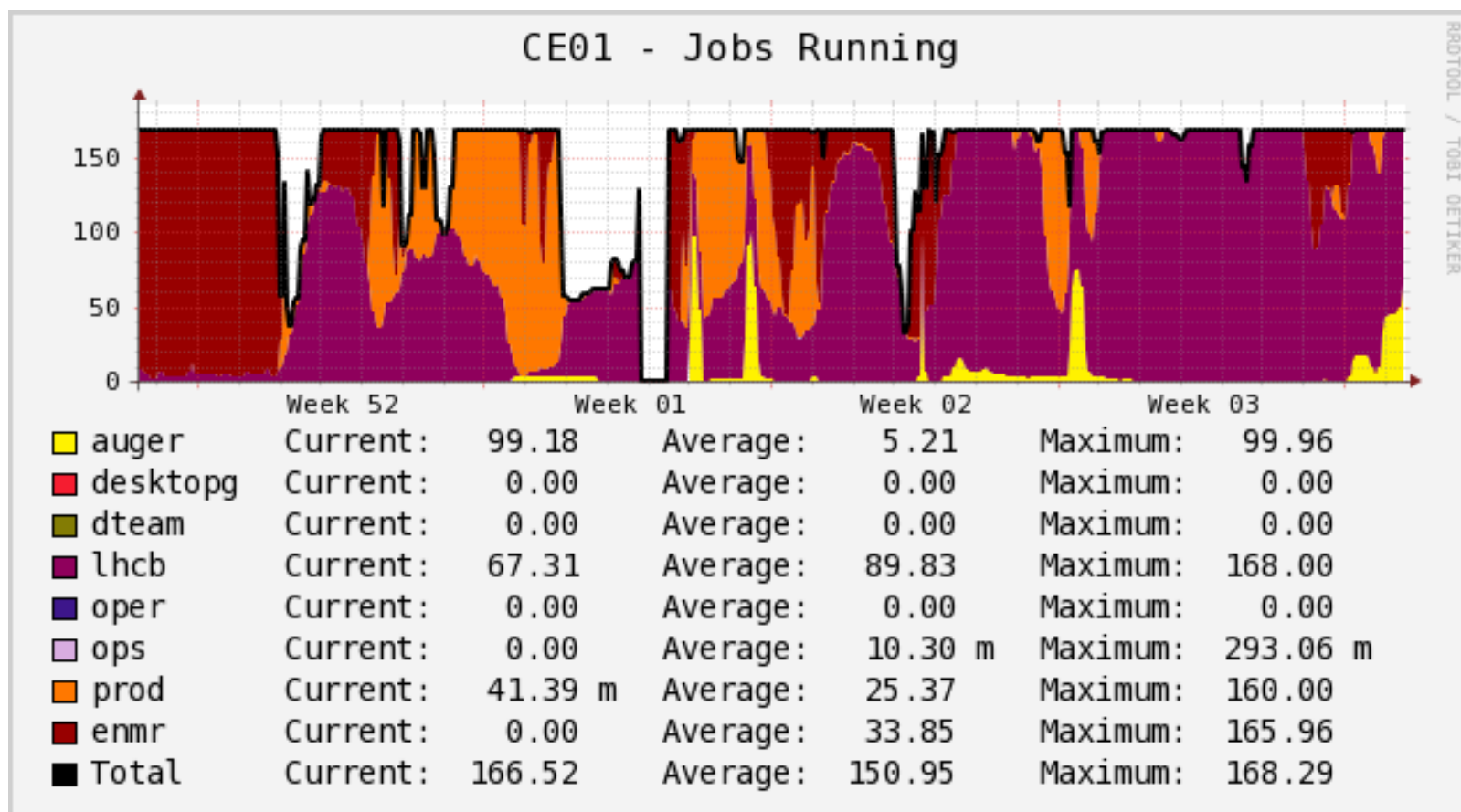
- **WP3 (provided by Diego Carvalho – WP3 Manager)**
  - Outcomes (cont' d)
    - Earth Sciences VRC
      - *Apparent weak diffusion in LA*
      - *Decision: foster the creation of a new community in LA*
      - *VO: prod.vo (GISELA) which is the catch-all VO that support several other initiatives*
        - More than 14 research groups in LA contacted by GISELA
        - Resources and tools, such as CAM-WRF, offered
        - Contacting IPGP (France) in order to create new “fronts
    - High Energy Physics
      - *Several LA groups have been supported since the beginning of GISELA (Argentina, Brazil, Colombia and Venezuela)*
      - *VOs: auger, atlas, cms, lhcb, alice.*
        - Supported by sites in Argentina, Brazil, Chile, Colombia, Mexico and Venezuela



- **WP3 (provided by Diego Carvalho – WP3 Manager)**

- Outcomes (cont' d)

- Example of a Latin American site (UFRJ-IF)



- **WP4 (provided by Ramon Diacovo – WP4 Manager)**
  - Integration of RCs in the GISELA infrastructure and running of Core services (see <http://documents.gisela-grid.eu/record/84?ln=en>)
    - 11 integrated Resource Centres operated by GISELA
      - 5 running *gLite* (service middleware)
      - 6 running *OurGrid* (opportunistic middleware)
    - 8 integrated Resource Centres operated by third parties
    - 11 Resource Centres contacted for integration
      - *currently at different integration stages*
    - GISELA central services fully operational

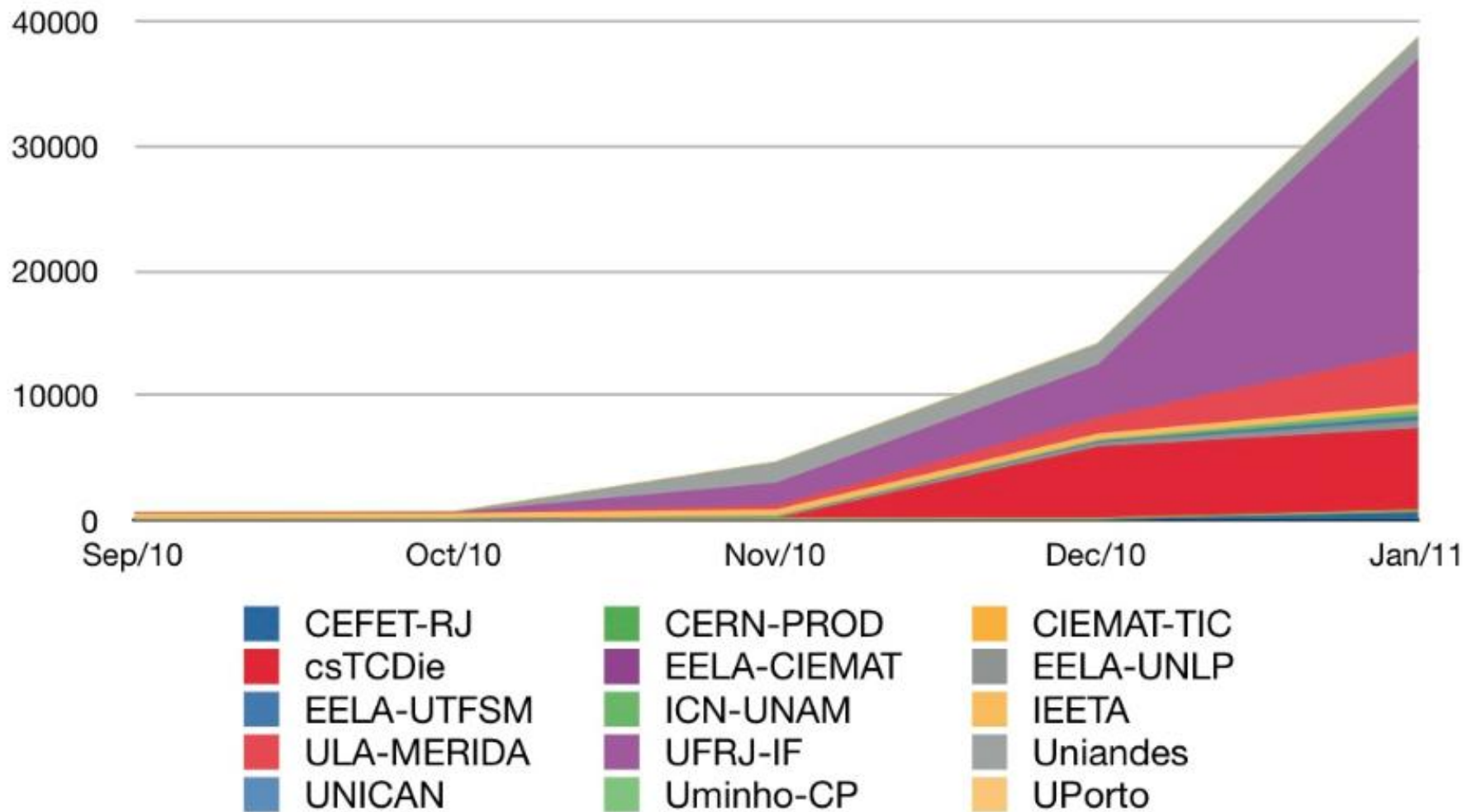


- **WP4 (provided by Ramon Diacovo – WP4 Manager)**
  - GISELA consortium RCs already inserted into the EGI infrastructure
    - Pros
      - *Uniform of quality thresholds*
      - *Uniform tools (monitoring, accounting etc)*
  - Resources are operated by various entities (NGIs, ROCs)
    - IGALC is amongst them, funded by GISELA
    - Others are
      - *ROC\_LA (collaborating with IGALC)*
      - *IGI*
      - *IBERGRID*
  - GISELA operates a project VO: [prod.vo.eu-eela.eu](http://prod.vo.eu-eela.eu)
    - accommodates starter / small VRCs
    - accepted in all GISELA consortium Resource Centres
  - GISELA supports large / well established VRC VOs
    - Consortium resources are allocated upon request
    - Recent examples: We-NMR, auger

- **WP4 (provided by Ramon Diacovo – WP4 Manager)**
  - MoU being signed between a representative of the Consortium (UFRJ) and EGI.eu
    - GISELA soon to become an EGI Infrastructure Provider
    - An official Operations Management Board seat in EGI will make GISELA-operated Resources better represented
      - *Opportunity to expose Latin American needs to middleware development*
    - Tighter collaboration with EGI translates into better gLite knowledge dissemination and access to useful tools
  - SAGrid is willing to establish a cooperation between South Africa and Latin America, through GISELA

- WP4 (provided by Ramon Diacovo – WP4 Manager)

Accumulated Norm. CPU Hours - prod.vo.eu-eela.eu



- **WP5: CLARA and NRENS plans for network activities defined in <http://documents.gisela-grid.eu/record/85?ln=en>**

- **WP6 (provided by F. Vilar Brasileiro – WP6 Manager)**
  - **Service portfolio available at:**  
[http://www.gisela-grid.eu/index.php?option=com\\_content&view=article&id=16&Itemid=19](http://www.gisela-grid.eu/index.php?option=com_content&view=article&id=16&Itemid=19)
  - **Support mainly provided through mailing lists**
    - wp6-support-users for application-related services
      - Register at <http://eu-eela.eu/mailman/listinfo/wp6-support-users>
    - wp6-support-admins for infrastructure-related services
      - Register at <http://eu-eela.eu/mailman/listinfo/wp6-support-admins>
  - **Support for more established services provided by specific mailing lists**
    - OurGrid
      - Register at <http://mlists.ourgrid.org/mailman/listinfo/ourgrid-use-ml>
    - DIRAC
      - Register at <http://www.lsoft.com/scripts/wl.exe?SL1=DIRAC-GRID-L&H=IN2P3.FR>

- **WP6 (provided by F. Vilar Brasileiro – WP6 Manager)**
  - New Services being developed:
    - GUMA (Grid Uniandes Management Application)
      - *a java application based on open technologies to execute and manage virtual clusters on opportunistic environments*
    - BeeFS (Beehive File System)
      - *a distributed file system that is able to consolidate the spare disk space in desktops in a single POSIX-compliant file system*
    - Both services are available for beta test and should be made available in production shortly
    - A cloudburst service for OurGrid users is under development
      - *It allows seamless execution of CPU-intensive applications in hybrid e-Infrastructures augmented with the capability of interfacing with cloud computing providers such as Amazon Web Services EC2*

- **Survival of the EELA, EELA-2 and GISELA results (more than 6 years efforts / EC support)**
- **Successful handover to CLARA and LA NRENS (Role of the CLARA TT)**
- **Creation of NGIs and / or EGDS in Latin America & the Caribbean**

**Thank you**