Organized by:

Dpto de Ciencias de la Atmósfera y los Océanos – UBA

WMO – World Weather Research Program

Servicio Meteorológico Nacional

5-16 AUGUST 2013 - BUENOS AIRES - ARGENTINA

Motivation for T-NOTE

Forecast Challenges

Claudia Campetella

Celeste Saulo

¿Why T-NOTE?

We do not have experience, nor formal training on nowcasting techniques at any level

However…

There is a real need to incorporate this knowledge

¿Why T-NOTE?

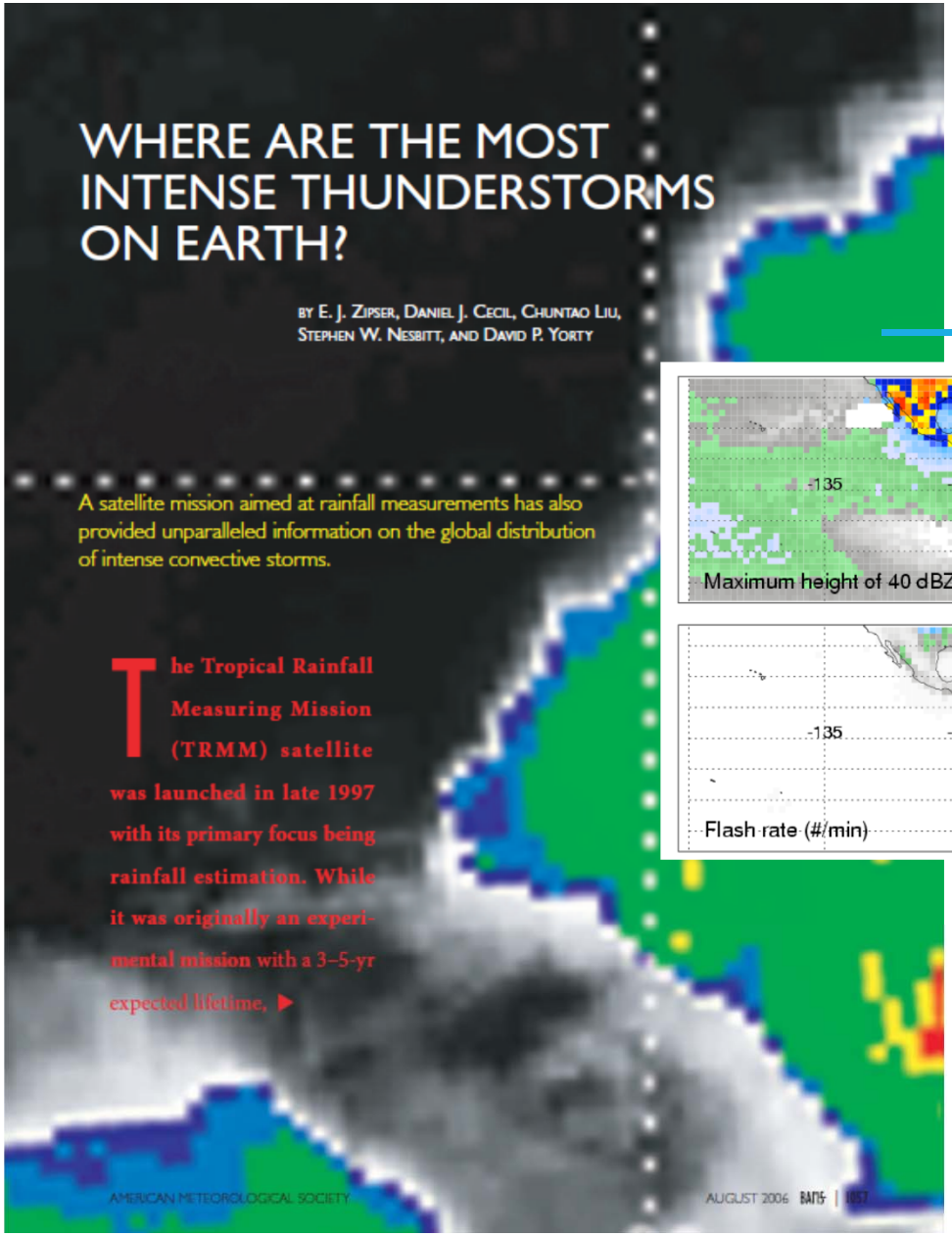
High Impact Weather in South America…

- Heavy and/or persistent rains (frequently leading to floods and slides)

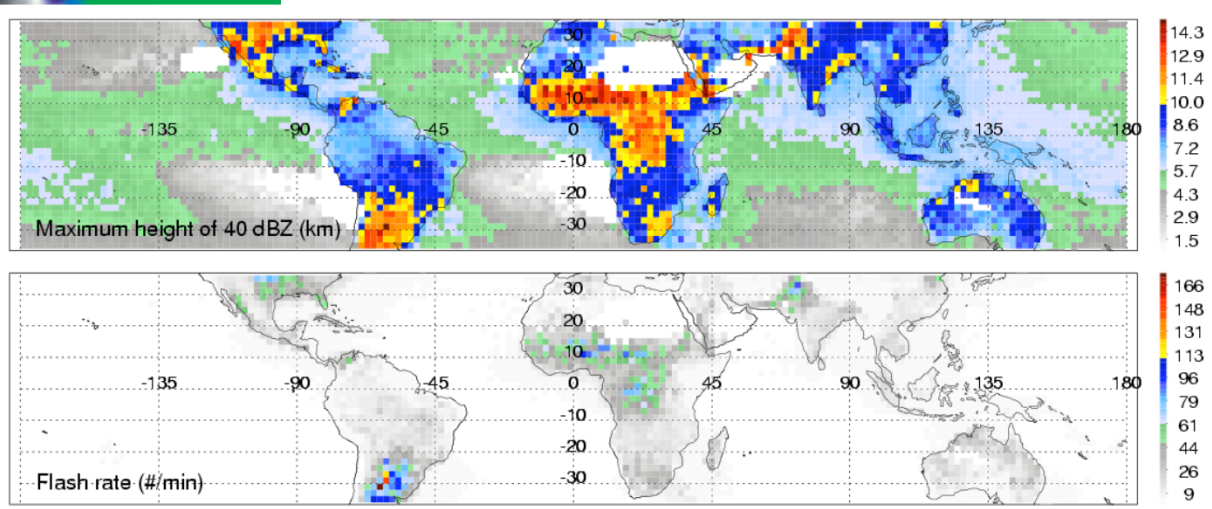
¿Why T-NOTE?

High Impact Weather in South America…

- Severe storms (tornados, wind gusts, hail, lighting, etc.)

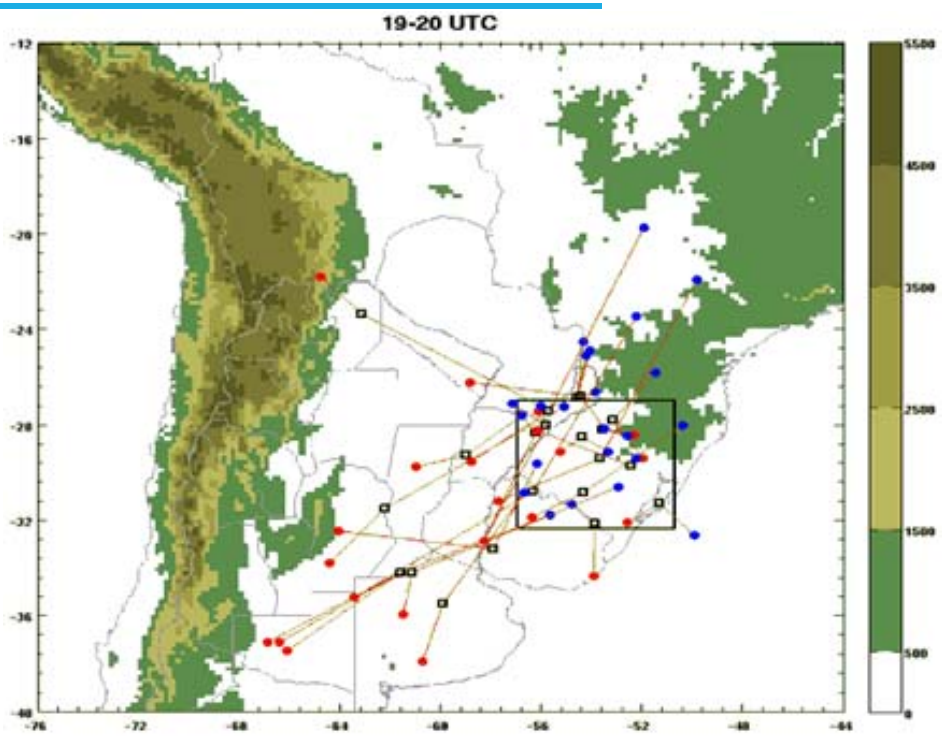


¿Why T-NOTE?



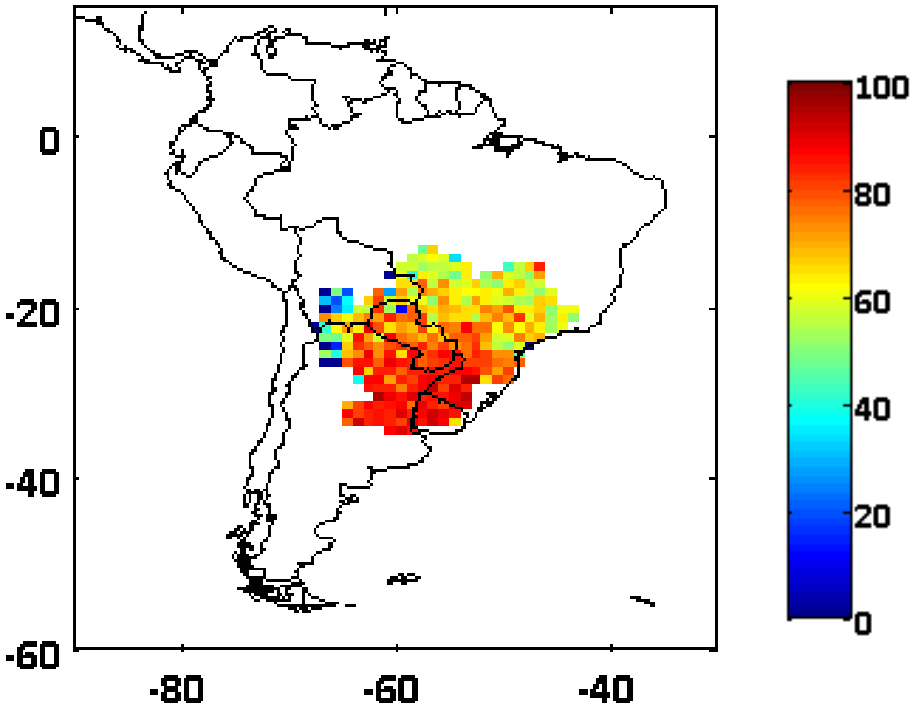
Most extreme 1% PFs in each category for each 2-degree latitude-longitude box (after Zipser et al, BAMS, 2006)

¿Why T-NOTE?



Trajectories of mesoscale convective systems over Southeastern South America that reach CHUVA field campaign area. Red dots are the initiation stage, open black box mature stage and blue dot dissipation stage (courtesy Paola Salio and Luciano Vidal).

¿Why T-NOTE?



Percentage of surface rain from 2A25 explained by MCS , courtesy Paola Salio

Huge MCSs accounting for large percentage of total summer precipitation

¿Why T-NOTE?

- 3 Megacities: Sao Pablo , Buenos Aires and Rio de Janeiro
- Regions with high population density – some of them with high vulnerability

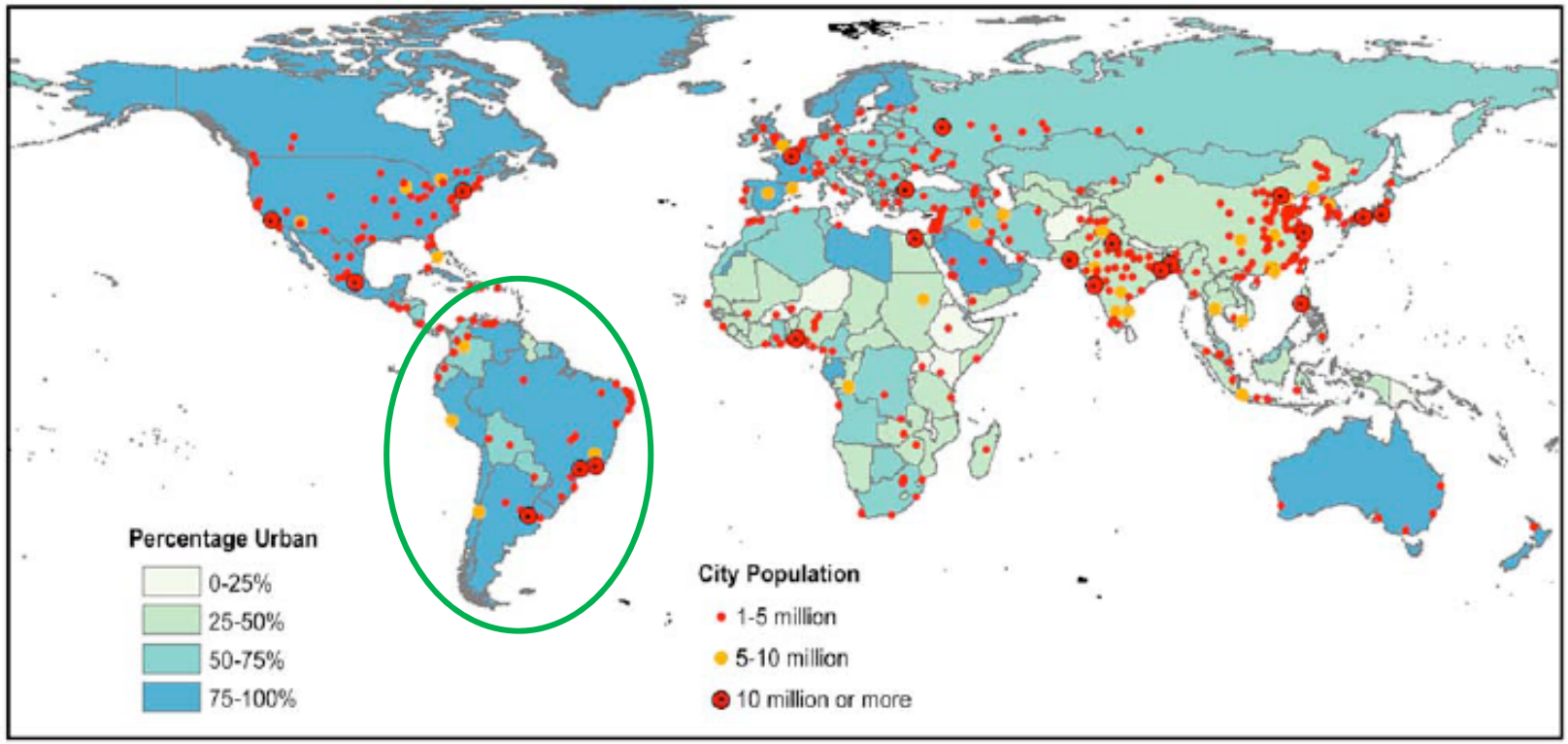


Figure 1 - Urban Agglomeration in 2009 (urban proportion of the world population: 50.1%)
Source: [*UN Department of Economic and Social Affairs*, 2010]

¿Why T-NOTE?

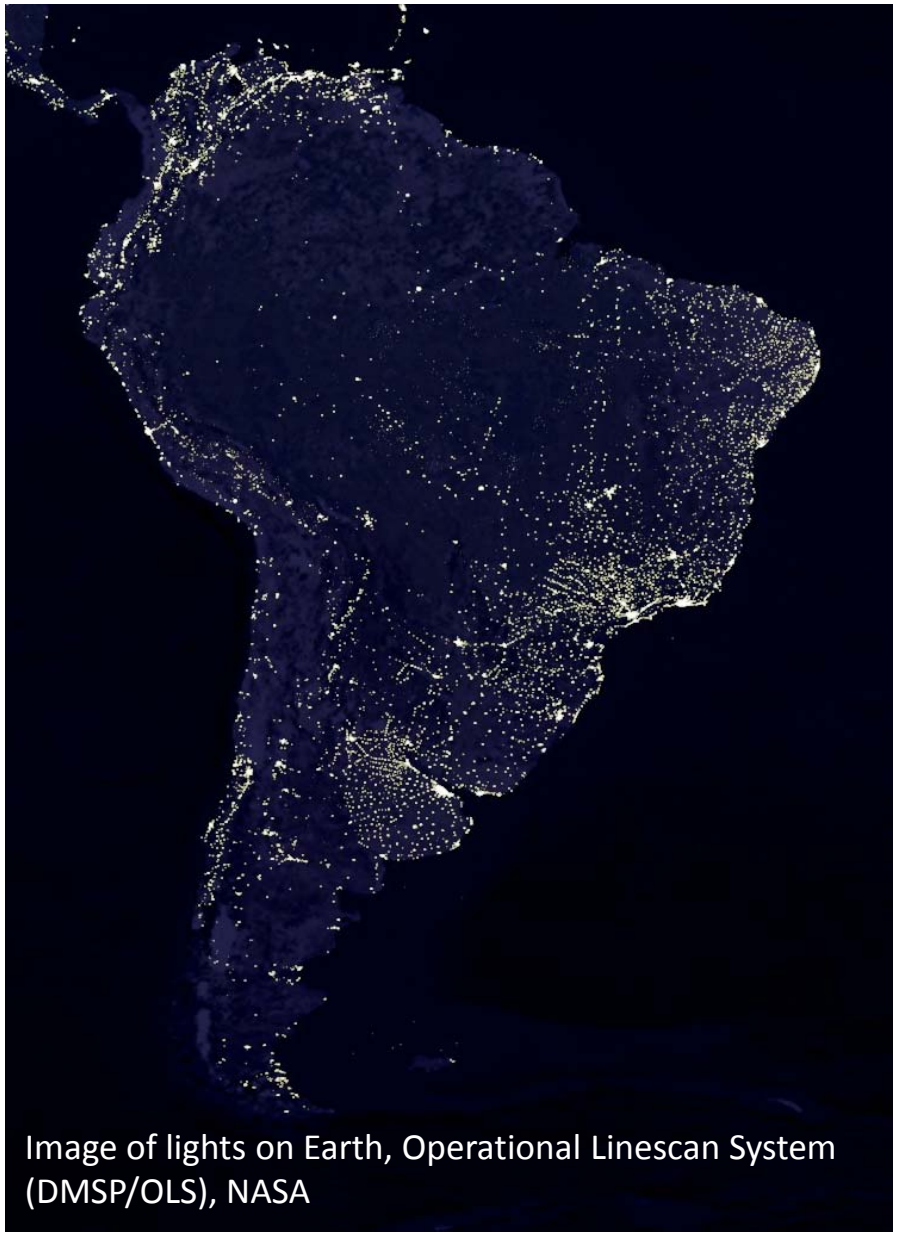
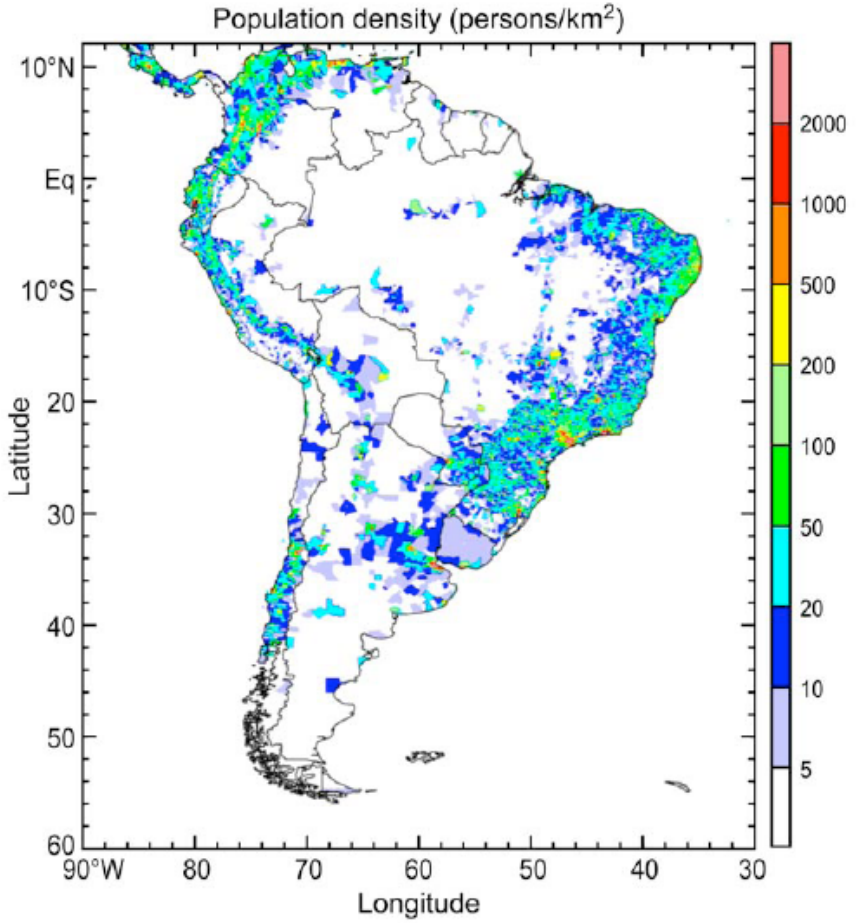


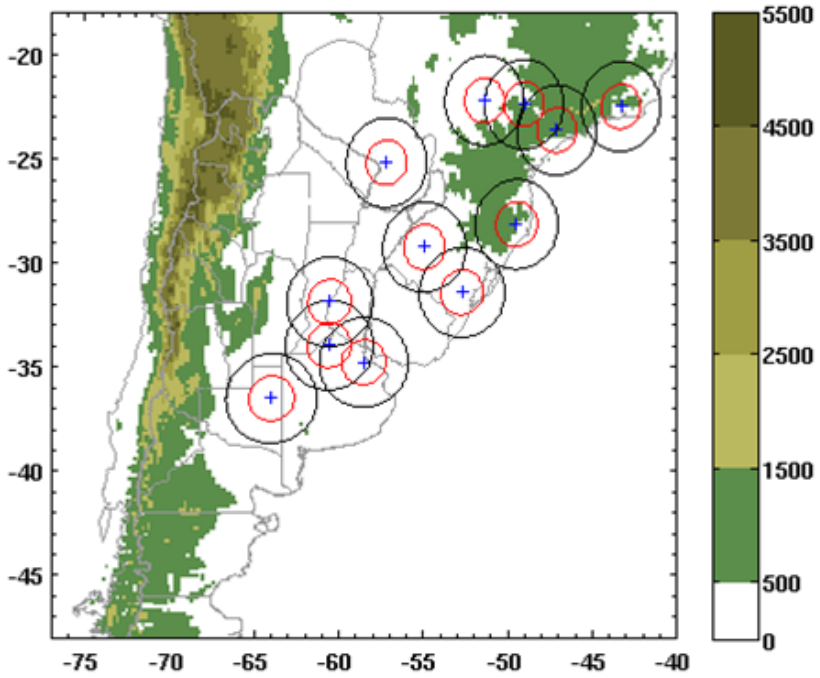
Image of lights on Earth, Operational Linescan System (DMSP/OLS), NASA



WMO/IGAC Impacts of Megacities on Air Pollution and Climate, GAW Report No. 205

¿Why T-NOTE?

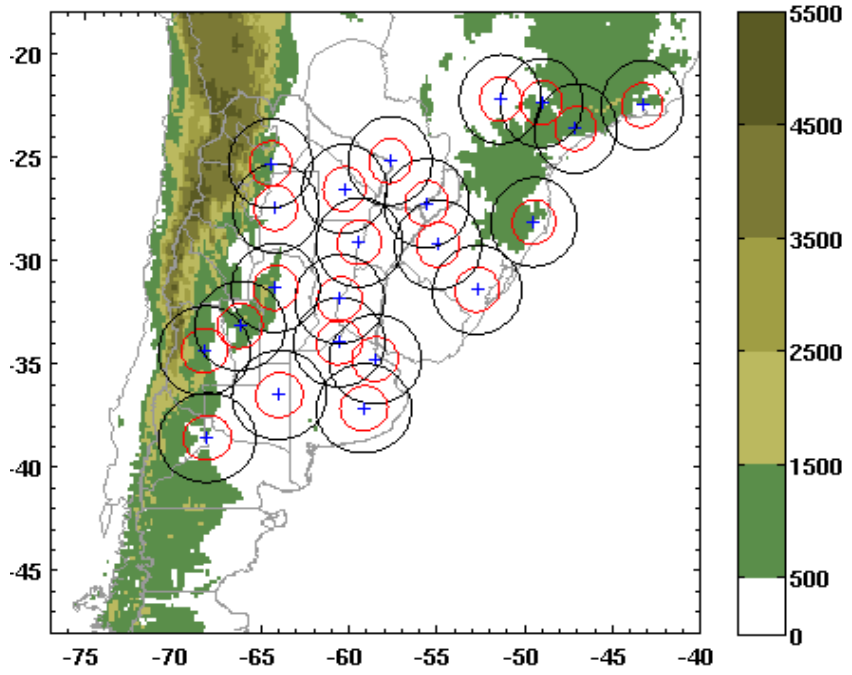
- ✓Increased efforts to articulate the regional radar network between southern Brazil and Argentina
- ✓Paraguay also has a radar in Asunción that is partially operational at this moment.



Operational Radar Network in 2013

¿Why T-NOTE?

- ✓In June 2011, the Argentine President signed a contract for an investment of 10 million dollars to develop a prototype of a weather radar to be fully constructed in Argentina.
- ✓This is the initial step to work on a radarization project at a national level, named SINARAME (Sistema Nacional de Radares Meteorológicos)



Projected Radar Network by 2015

¿Why T-NOTE?

- ✓High Impact weather forecast is a challenge
- ✓Our population is highly vulnerable
- ✓Several nowcasting tools have been generated and are increasingly being adopted by different NMS
- ✓There is a Radar Network that is increasing, particularly over Argentina and Brazil
- ✓We need to move forward in the direction of nowcasting

T-NOTE objectives

- ✓To develop the areas of nowcasting and very short forecasting at the regional level by means of comprehensive training activities on this field.
- ✓To leverage the local capacity, so that a critical mass of trainers can be formed under this activity (i.e., training of trainers).
- ✓To interact with potential users of nowcasting in order to develop new tools to their activities based on nowcasting products from measurements, remote sensors, models and blending techniques available over the region.

¿Who are in T-NOTE? Institutions

We received financial support from:

- WMO – WWRP (World Weather Research Programme)
- WMO - ETPR (Education and Training Programme)
- Departamento de Ciencias de la Atmósfera y los Océanos - UBA
- Servicio Meteorológico Nacional
- Centro de Investigaciones del Mar y la Atmósfera – CONICET-UBA, UMI 3351-CNRS
- Departamento de Computación – FCEN – UBA
- IAI – Inter-American Institute for Global Change Research
- INVAP

¿Who are in T-NOTE? Trainers

Rita Roberts (NCAR - USA) – Organizing Committee

Paul Joe (Environment Canada - Canada) - Organizing Committe

James Wilson (NCAR - USA)

Isztar Zawadzki (McGill University - Canada)

Carlos Morales (USP - Brasil)

Steve Goodman (NASA/NOAA, USA)

Estelle de Coning (South African Weather Service)

Jenny Sun (NCAR, USA)

Celeste Saulo (DCAO-FCEN-UBA/CIMA-UMI) – Local Org. Committe

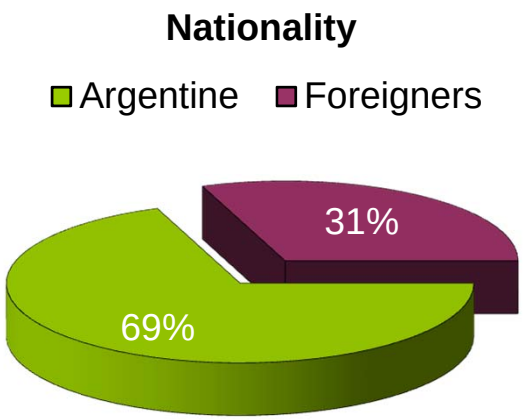
Paola Salio (DCAO-FCEN-UBA/CIMA-UMI) – Local Org. Committe

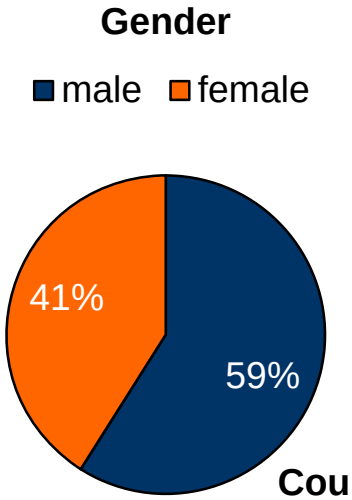
Claudia Campetella (SMN/ DCAO-FCEN-UBA) – Local Org. Committe

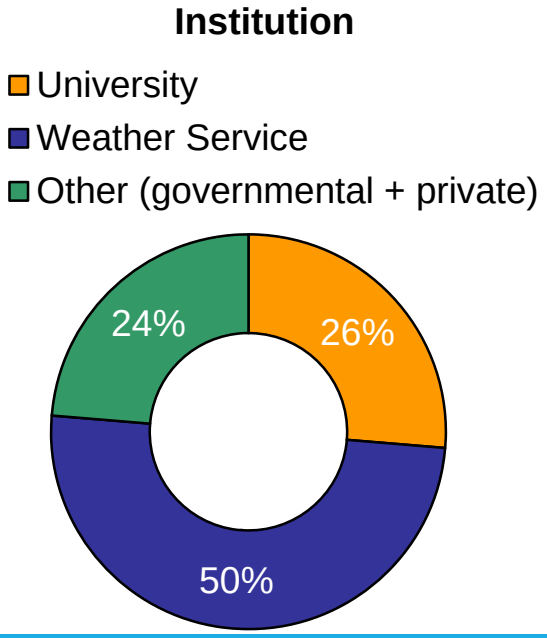
Juan Ruiz (DCAO-FCEN-UBA/CIMA-UMI - Argentina)

Invited talks:
Gustavo Cabrera (INVAP, Argentina) José García-Moya Zapata (AEMET, Spain)

¿Who are in T-NOTE? Participants

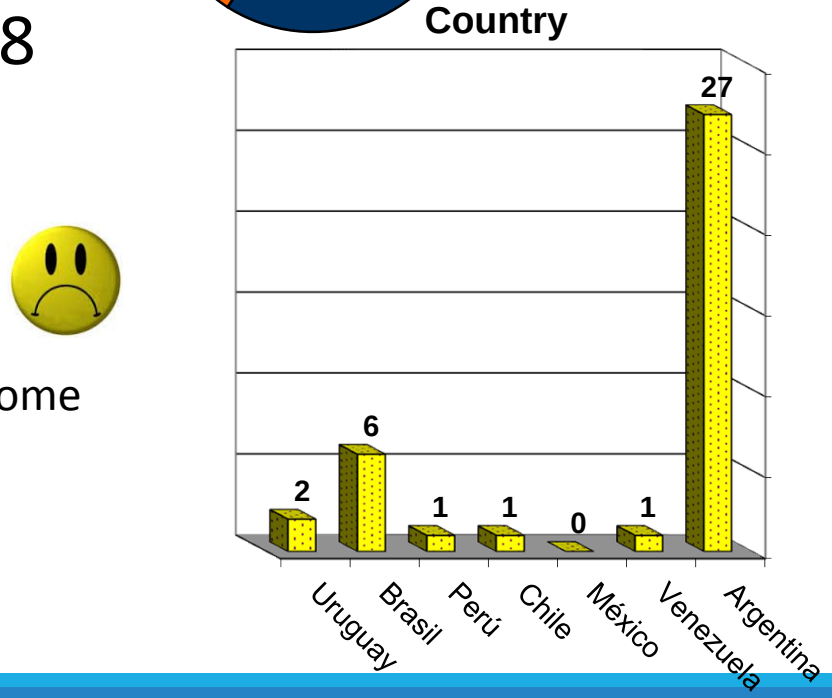




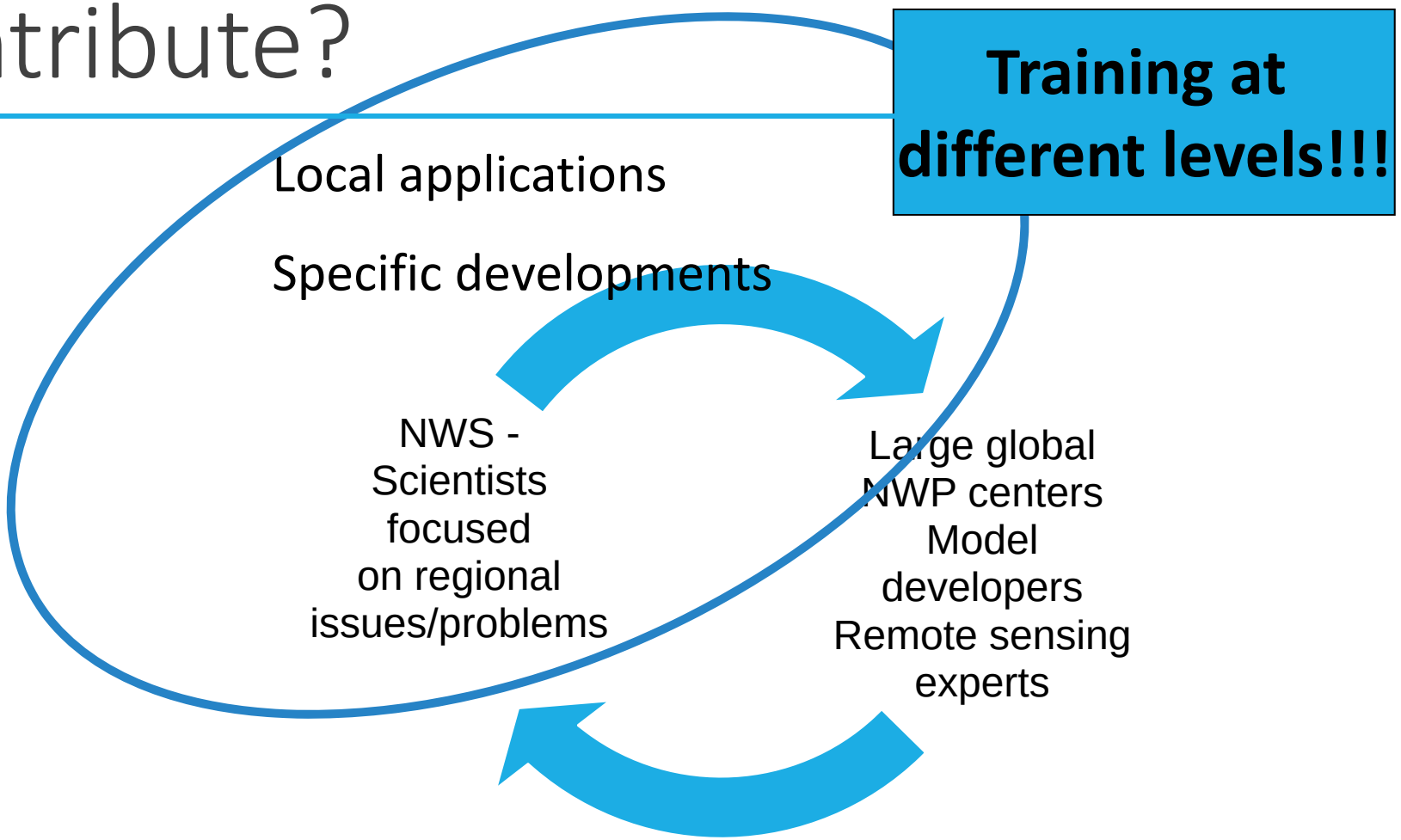


Total 38

México
Perú
2 Brazil
Couldn't come in the last minute



¿How do we expect T-NOTE to contribute?



T-NOTE outline

Week 1:
Basic Observations and Applications

Week 1 - Basic Observations and Applications

		5 Aug (Mon)	6 Aug (Tue)	7 Aug (Wed)	8 Aug (Thu)	9 Aug (Fri)
am	Session 1	Introductions, Forecast Challenges in S. America (Campetella, Saulo)	Polarimetric Radar (Zawadzki, Wilson)	Part I: Quantitative Precipitation Estimation (QPE) (Zawadzki)	Severe Weather Detection (Joe)	Part II: QPE Techniques (Zawadzki, Wilson)
	Session 2	Radar Basics & Interpretation (Wilson, Roberts)	Lab: Case study combining polarimetric radar (Zawadzki, Mezher)	Lab: QPE (Zawadzki, Salio)	Lab: Severe Weather case (Hail, gustfronts, tornadoes, bow echoes) & algorithms (Joe)	MCS and severe weather in SESA (Salio, Campetella, Saulo)
pm	Session 1	Storm Detection & Extrapolation Techniques (Roberts)	Satellite Basics (de Coning, Teleconf)	Lab: Satellite/NWP Instability Nowcasting (Joe, de Coning Teleconf)	Lightning Detection & Applications (Morales)	CARDS System (Joe)
	Session 2	Sounding Review & Analysis (COMET module) Lab 1: Storm Extrapolation Lab 2: Stability and Storms (Wilson, Roberts)	Satellite Applications & NOAA Products (Goodman, Teleconf)	Argentina Radars (INVAP)	Lab: Lightning Applications & severe weather (Morales)	Lab: Argentina Severe Wx Case using CARDS (Joe, Saulo, Campetella)

T-NOTE outline

Week 2: Nowcasting concepts, applications and systems

		12 Aug (Mon)	13 Aug (Tue)	14 Aug (Wed)	15 Aug (Thu)	16 Aug (Fri)
am	Session 1	Science of Nowcasting (Wilson)	Nowcast Process & Conceptual Models (Wilson)	Developing a Heuristic Nowcast System (Roberts)	Nowcasting for heavy rainfall over complex terrain (Wilson, Roberts, Joe)	Forecast Verification (Saulo & Ruiz)
	Session 2	Lab: Convergence Boundaries (Wilson, Roberts)	Lab: Nowcasting Thunderstorms, Case I (Wilson, Roberts)	Lab: Nowcasting Thunderstorms, Case II (Wilson/Roberts)	Ensemble and probabilistic forecasting (Saulo & Ruiz)	Lab: Forecast verification (Saulo & Ruiz)
pm	Session 1	Severe Weather Part II (Zawadzki)	Part II: NWP Models, Data Assimilation, & Applications (Jenny Sun via video conf)	Nowcasting & Role of Forecaster (Roberts, Joe, Campetella)	Scale dependence of nowcasting skill by Lagrangian persistence and by NWP (Zawadzki)	Building & designing nowcasting capabilities in S. America (all)
	Session 2	Part I: NWP Mesoscale Models & Assimilation (Ruiz, Saulo)	Blended Nowcast Systems (Wilson, Zawadzki)	Nowcasting Using Heuristic Rules (Wilson, Roberts)	Hi-res Ensemble Prediction system at AEMET (García-Moya Zapata)	Workshop wrap-up & closing

¡¡Welcome!!

Ask

Doubt

Work

Get Worried

Learn

Have fun!!