



MINISTÉRIO DA
CIÊNCIA, TECNOLOGIA
E INOVAÇÃO

GOVERNO FEDERAL
BRASIL
UNIÃO E RECONSTRUÇÃO



WORLD
METEOROLOGICAL
ORGANIZATION



World Climate Research Programme



WORLD WEATHER
RESEARCH PROGRAMME

Workshop: Numerical predictions for strategic sectoral applications: Modeling and verification approaches and challenges

Thursday 30 Nov Afternoon



Maria Assunção Faus da Silva Dias

Rhama-Analysis and Vexus Solutions
Universidade de São Paulo

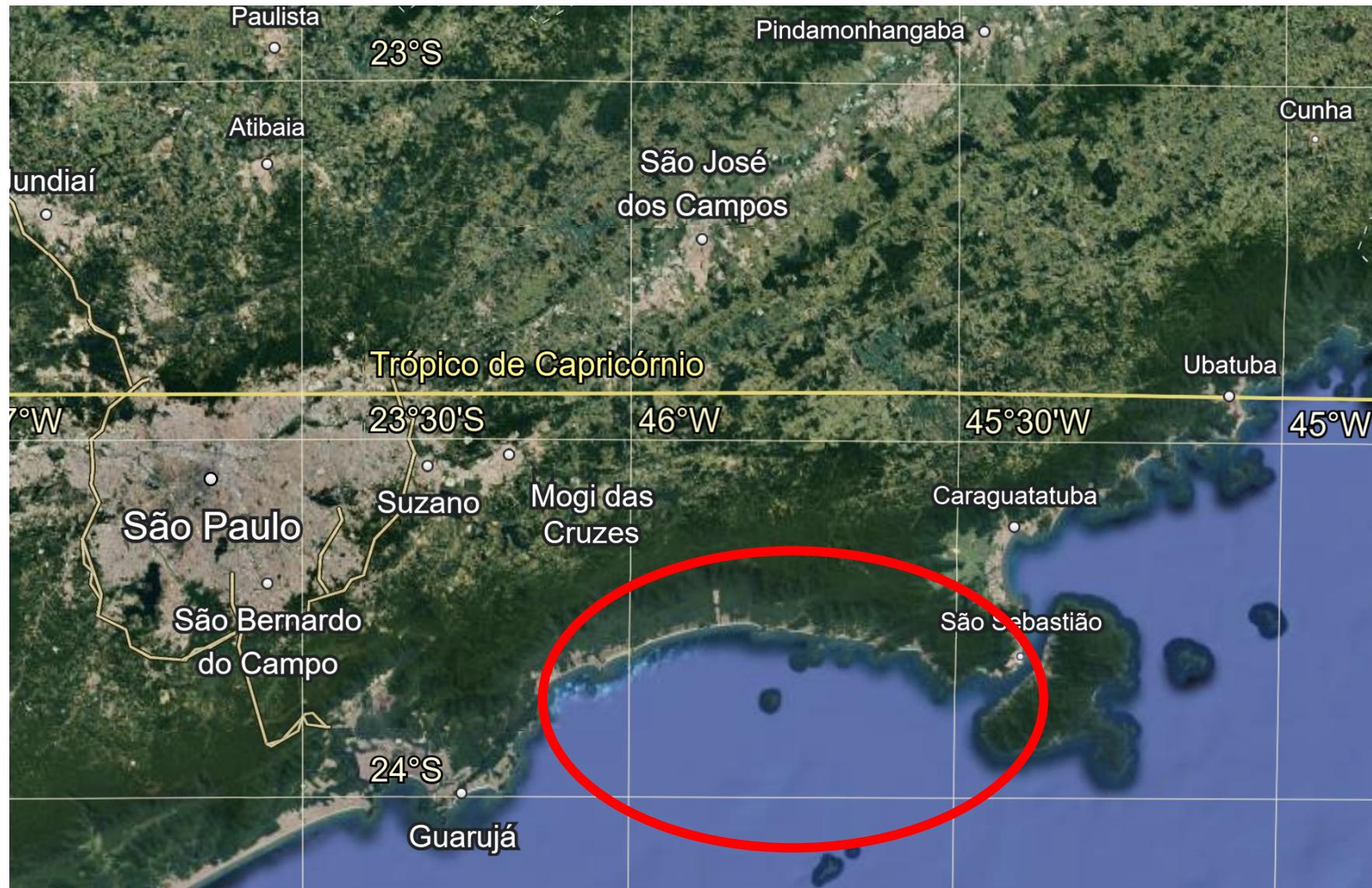
30 November 2023

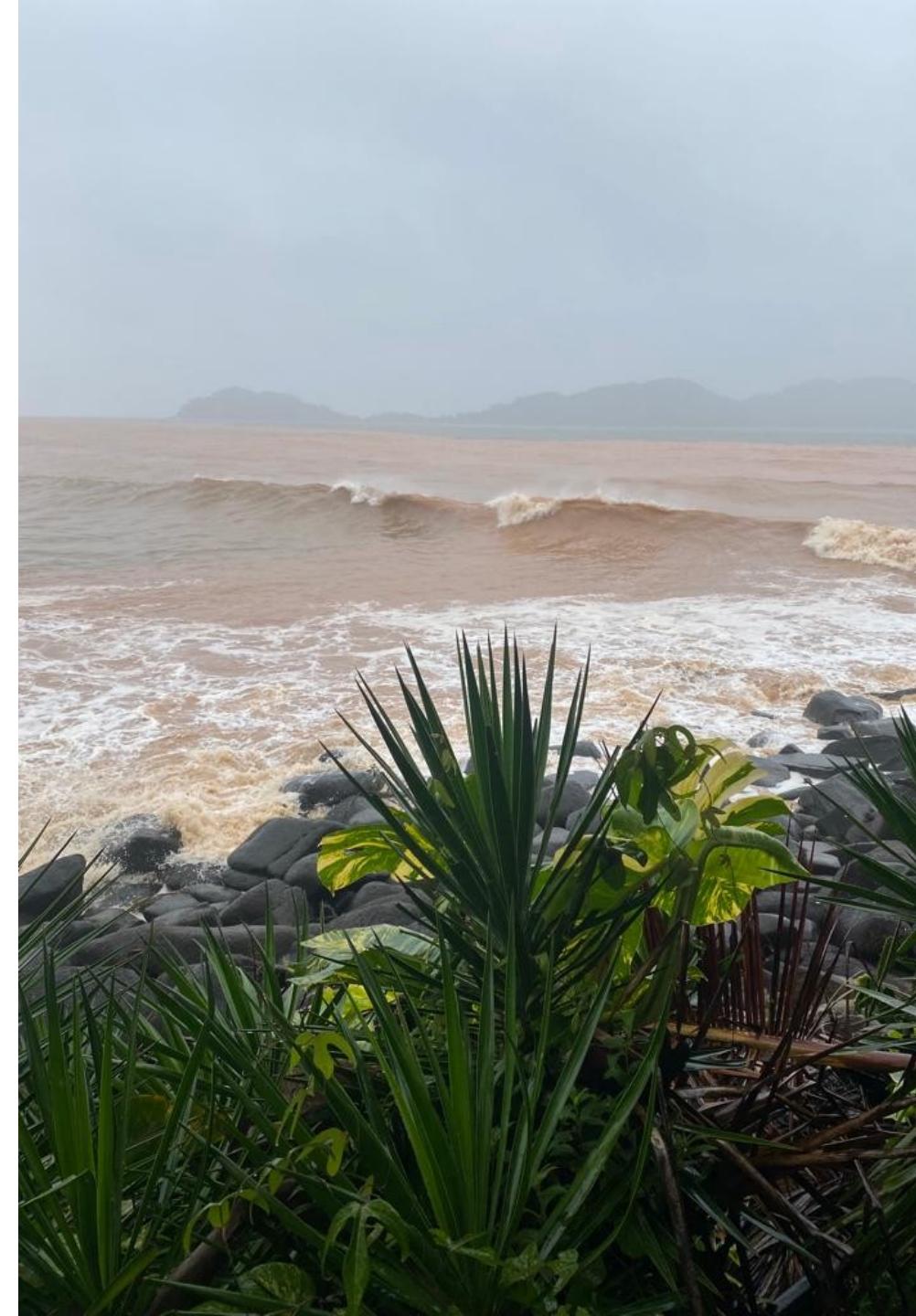
Reflections on recent extreme environmental events



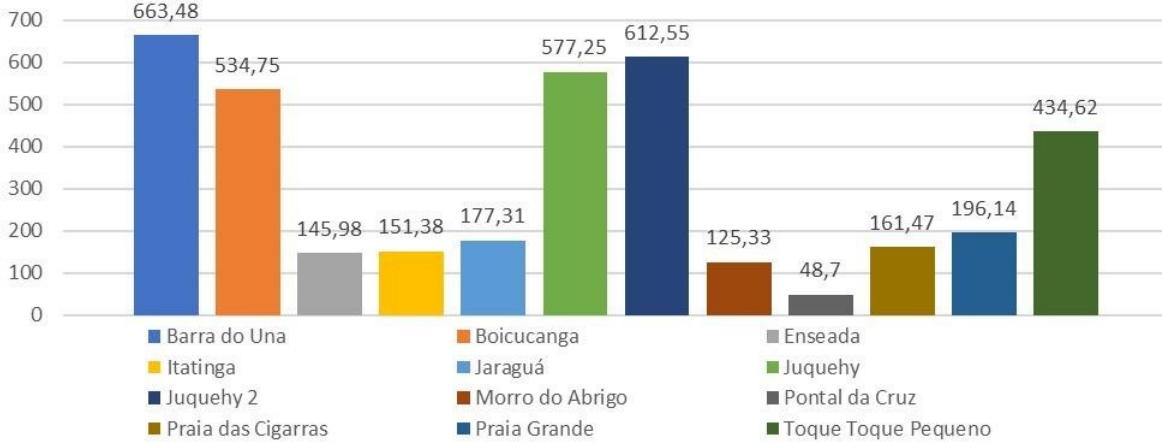
The word "VEXUS" is written in a large, light gray, sans-serif font. The letters are slightly outlined, giving them a sense of depth and perspective.







São Sebastião (SP) - Acumulado de precipitação (mm) de 17 a 19 fev 2023

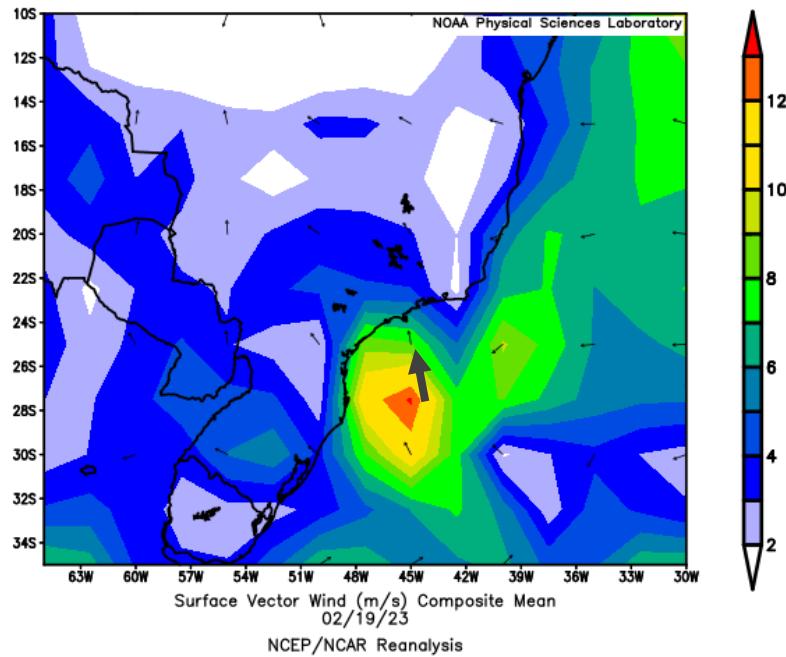


Fonte: Cemaden

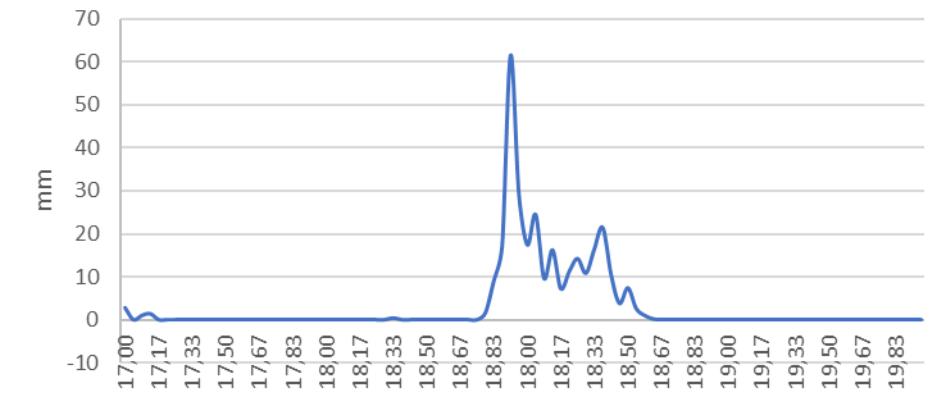
Bertioga (SP) - Acumulado de precipitação (mm) de 17 a 19 fev 2023.



Fonte: Cemaden



Bertioga-INMET (SP)
Rainfall (mm) 18-19 Feb 2023
total 292,6 mm



Chuvas no litoral de São Paulo causam destruição e deixam dezenas de mortos



PREFEITURA DE SÃO SEBASTIÃO

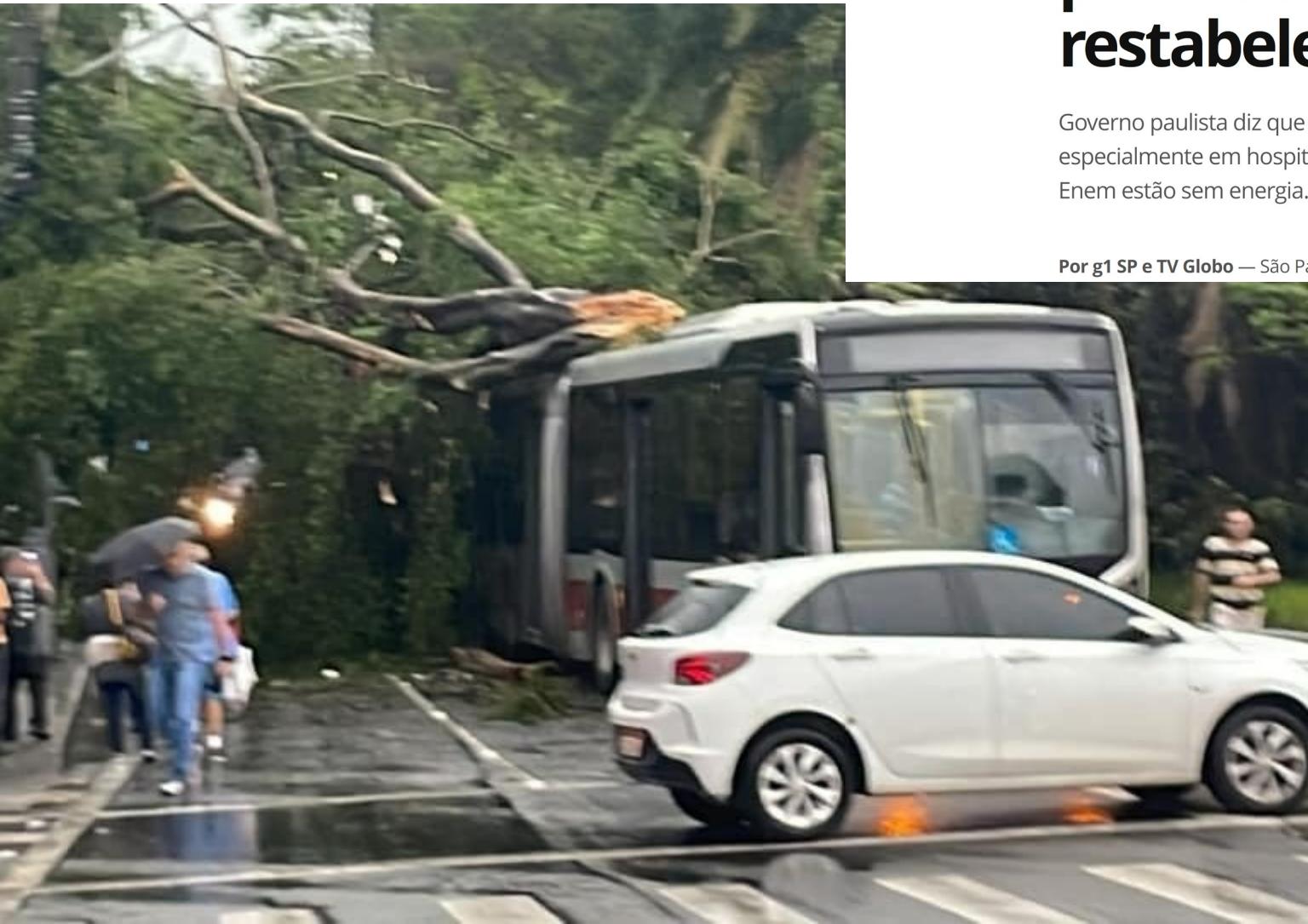


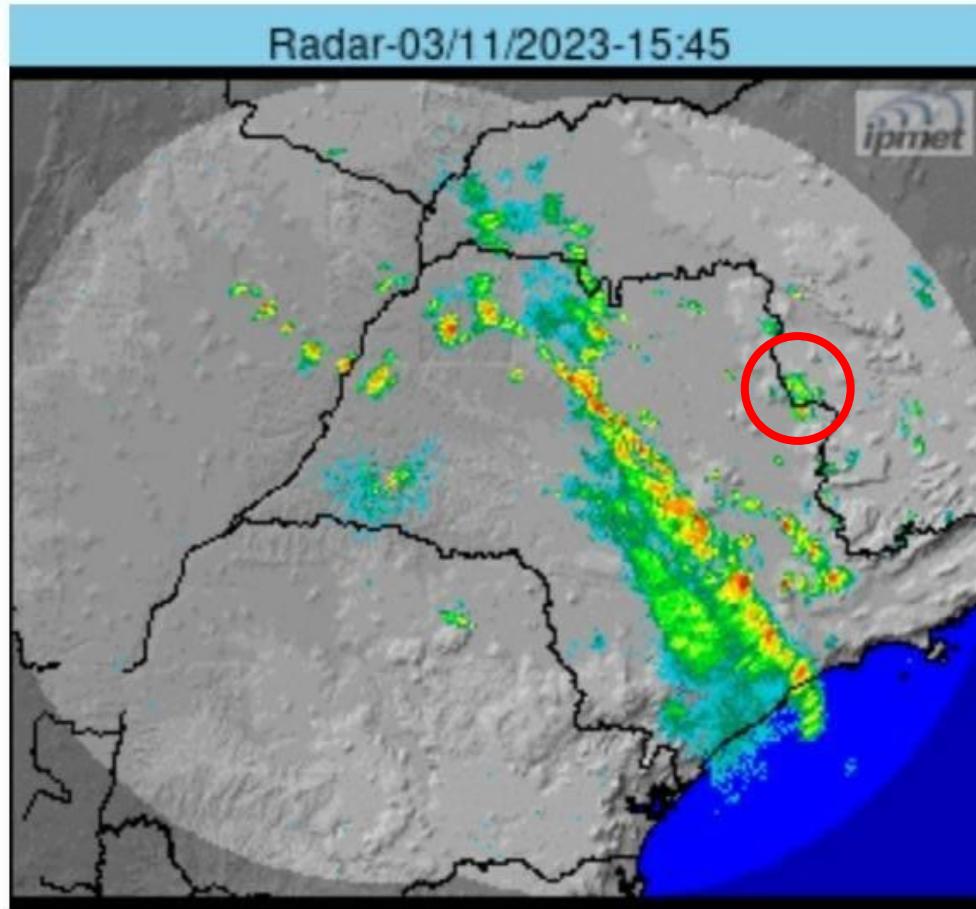
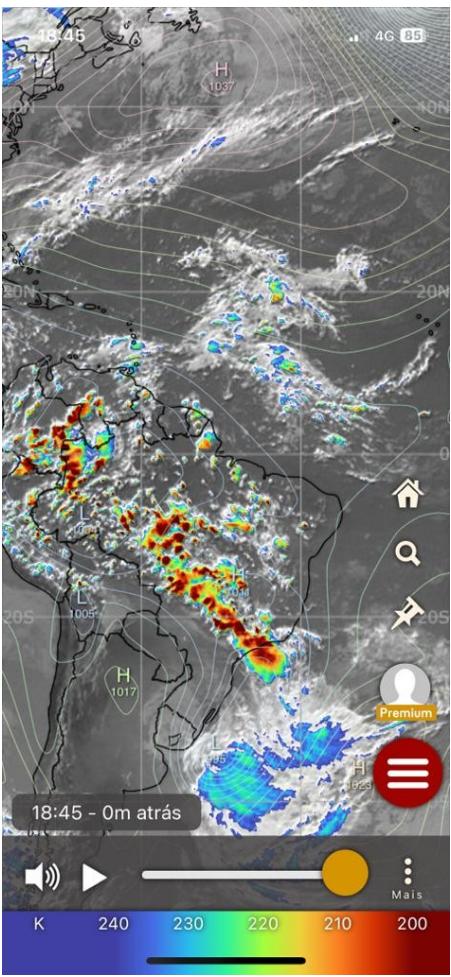


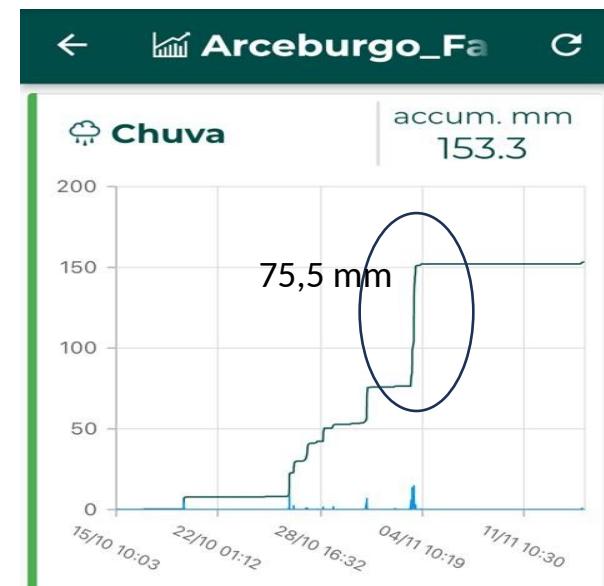
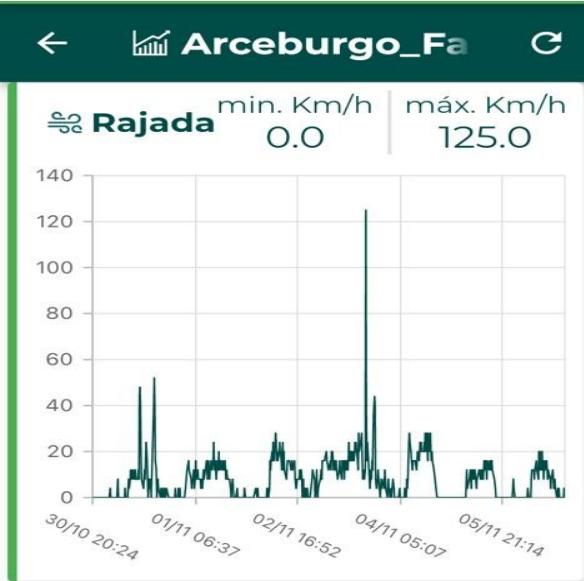
Estado de SP teve 2,5 milhões de imóveis sem energia neste sábado; previsão da Enel de restabelecimento total é terça-feira

Governo paulista diz que pressiona as concessionárias a agilizarem retomada dos serviços, especialmente em hospitais e serviços de emergência. 84 das 308 escolas onde será realizado o Enem estão sem energia.

Por g1 SP e TV Globo — São Paulo



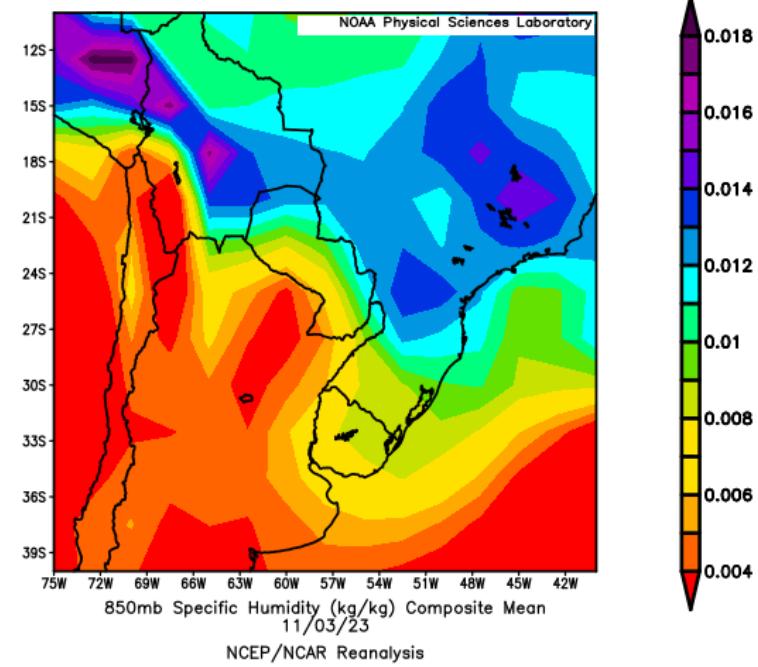
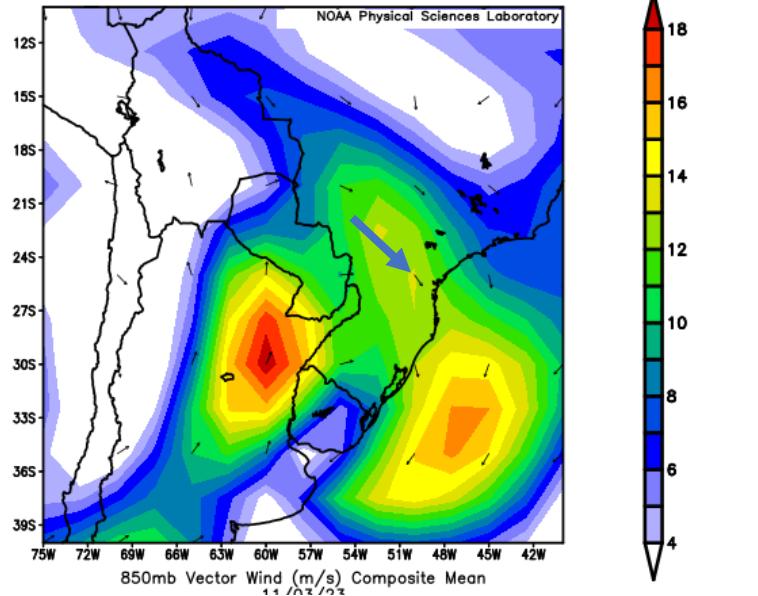




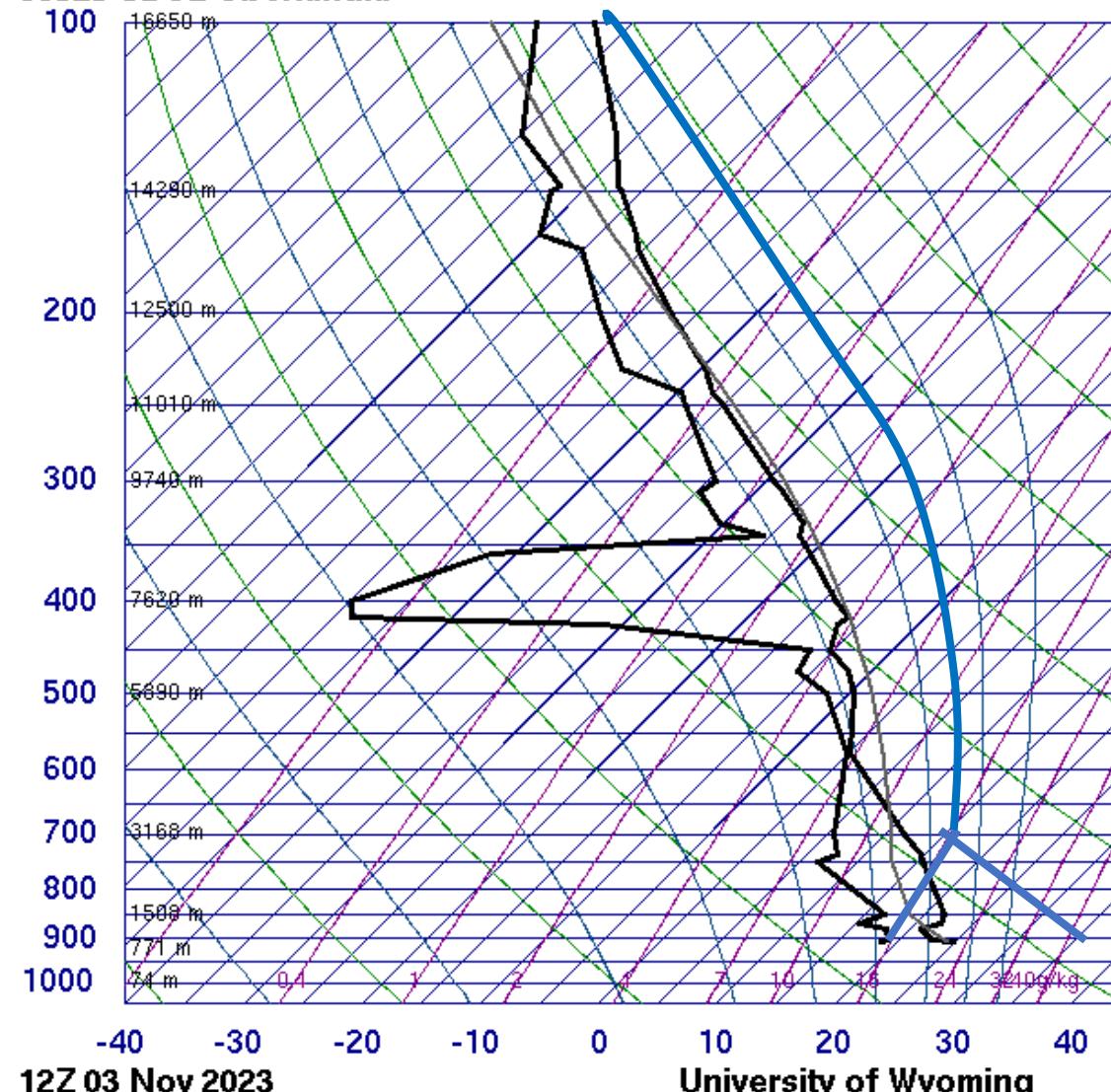
City	maximum gust			accum. rainfall 3-4/nov
	Local Time	speed (km/hr)	speed (m/s)	
Arceburgo (*)	1545	125,0	34,7	75,5
Piracicaba	1900	92,2	25,6	16,6
Sorocaba	1900	91,4	25,4	13,8
Lins	1800	89,6	24,9	
Bauru	1800	83,9	23,3	10
Itapira	2100	73,1	20,3	23,6
Jales	1900	69,8	19,4	37,6
Tupã	1700	69,8	19,4	5,4
Taubaté	2100	67,3	18,7	14,4
São Paulo Mirante	2000	65,5	18,2	11,6
São Simão	2100	64,8	18	7,6
Bragança Paulista	2000	62,6	17,4	18,4
Pres. Prudente	1600	60,8	16,9	0
São Paulo Interlagos	2000	60,5	16,8	13,2
São Carlos	2000	58,3	16,2	6
São Sebastião do Paraiso	2200	54,7	15,2	22,8
Cachoeira Paulista	1500	54,4	15,1	5,2
Franca	2200	47,2	13,1	23
José Bonifacio	1800	43,9	12,2	1,6
Marilia	1600	43,9	12,2	2,6
Casa Branca	1900	39,6	11	0
Bebedouro	2100	36,0	10	61,4
Ituverava	2000	33,8	9,4	18,8

(*) cooxupé

<https://bdmep.inmet.gov.br/>



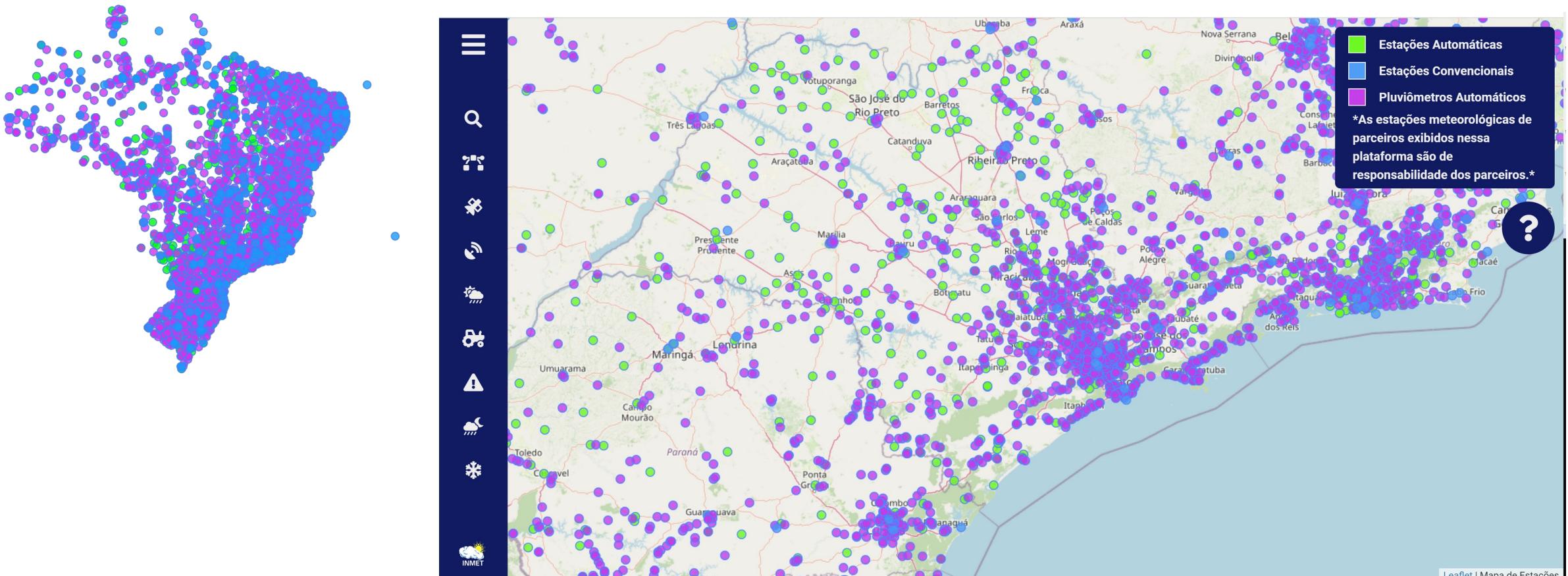
83525 SBUL Uberlandia



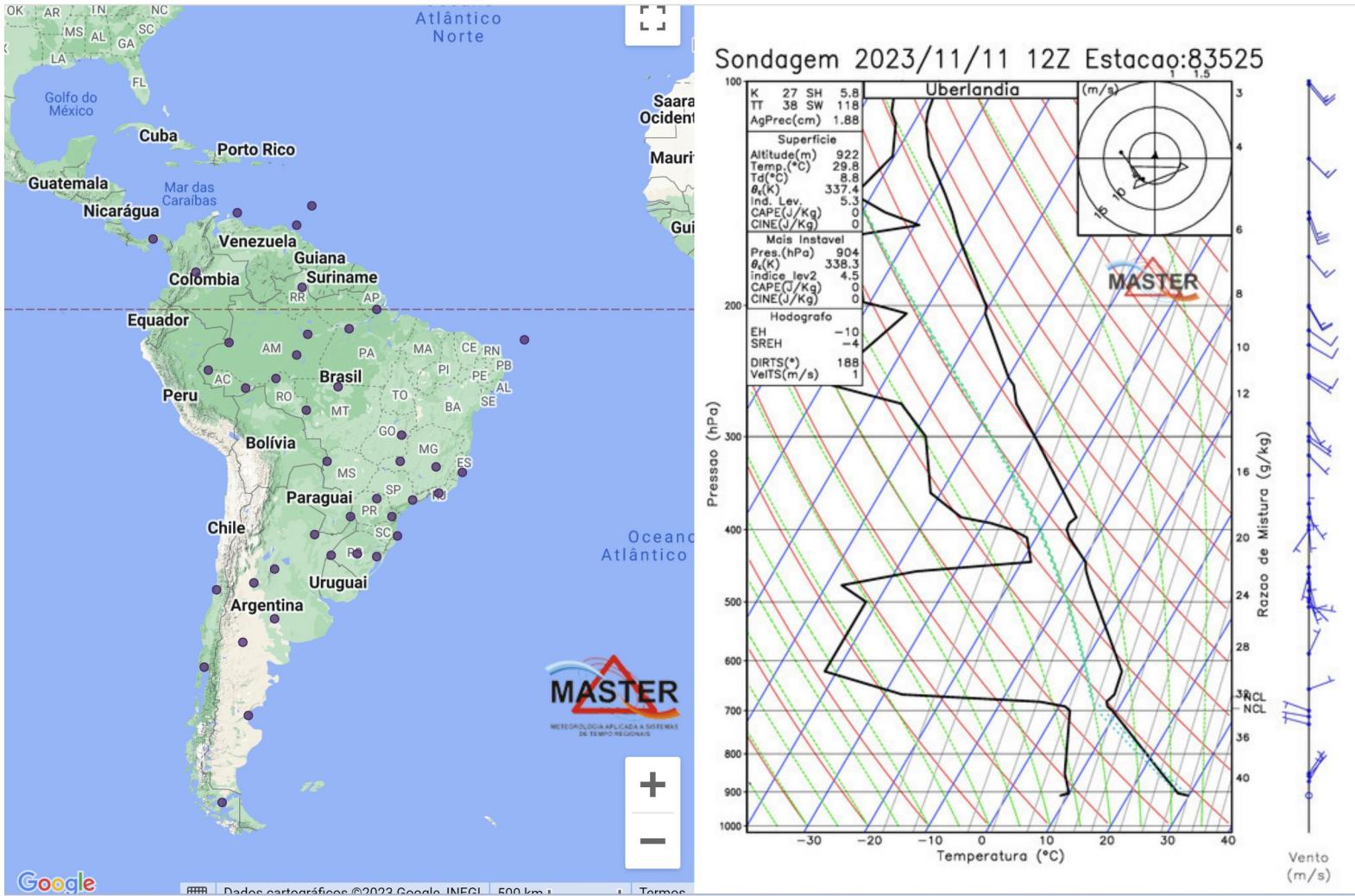
What is needed in Brazil Meteorological Services?

- Data assimilation
- Steady data flow from surface and upper air stations, radars,...
Incorporation of at least part of the private networks

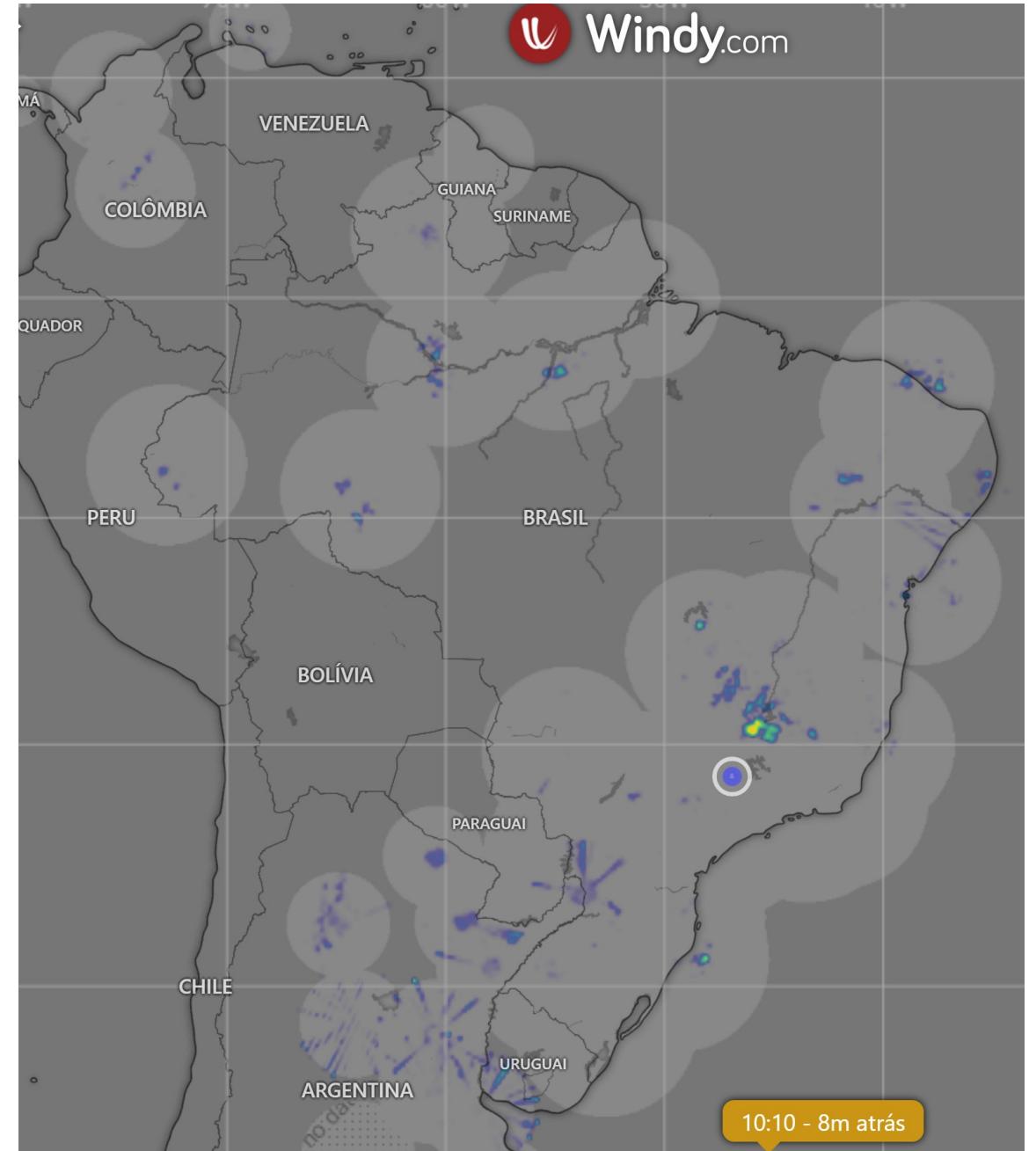
Surface Meso-network



Radiosonde network

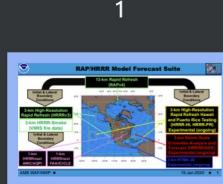


- Radar network
- Satellite estimates of rainfall
- Lightning locations



Data Assimilation and Regional Model Ensemble Forecasting

- The National Centers for Environmental Prediction (NCEP) runs two different versions of Rapid Refresh. The first generates weather data on a 13-km (8-mile) resolution horizontal grid and the second, the High-Resolution Rapid Refresh (HRRR), generates data down to a 3-km (2-mile) resolution grid for smaller regions of interest. RAP forecasts are generated every hour with forecast lengths up to 18 hours.
- Ensemble with High Resolution Models to generate probabilities



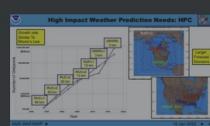
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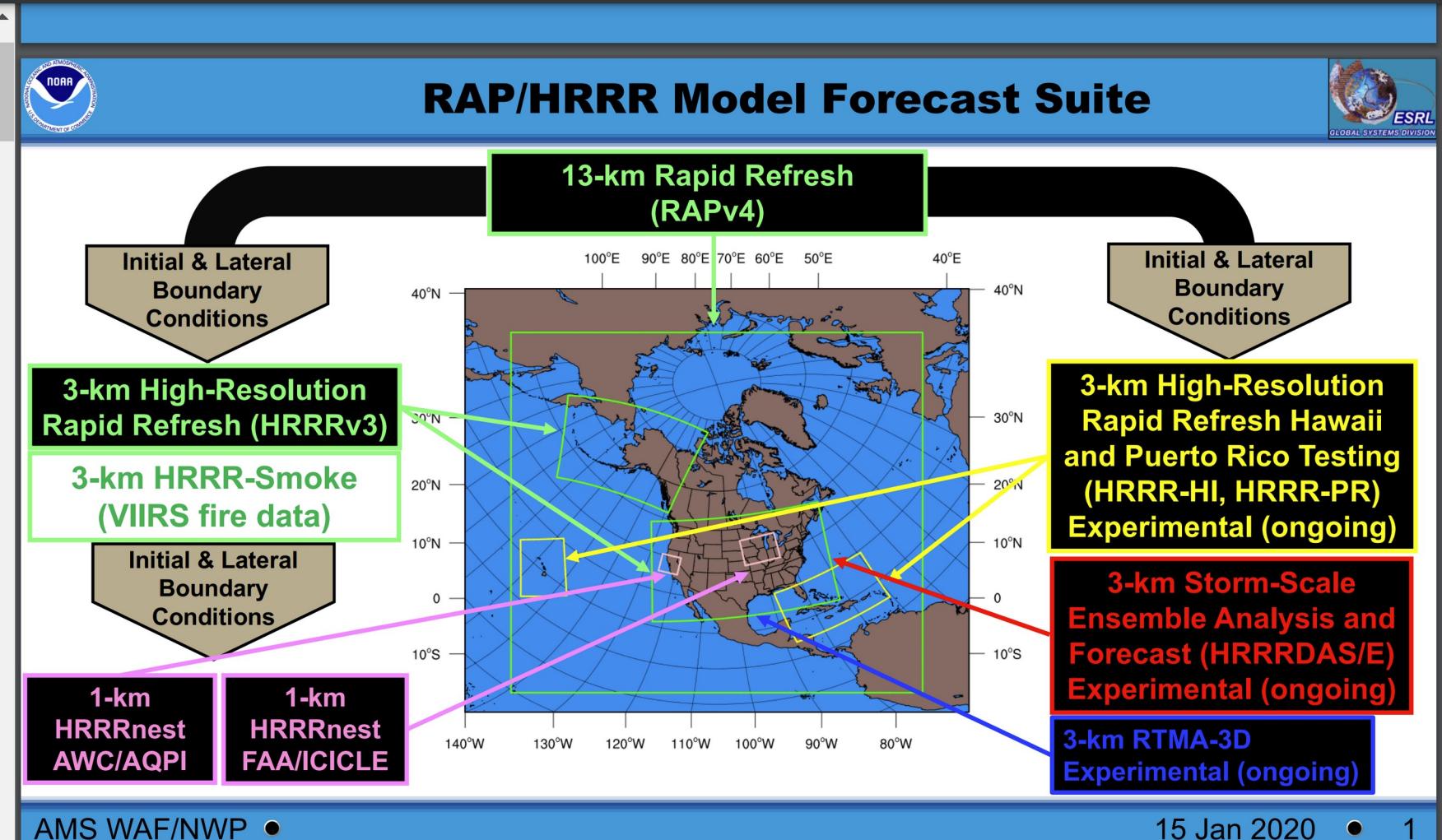
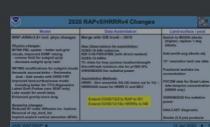
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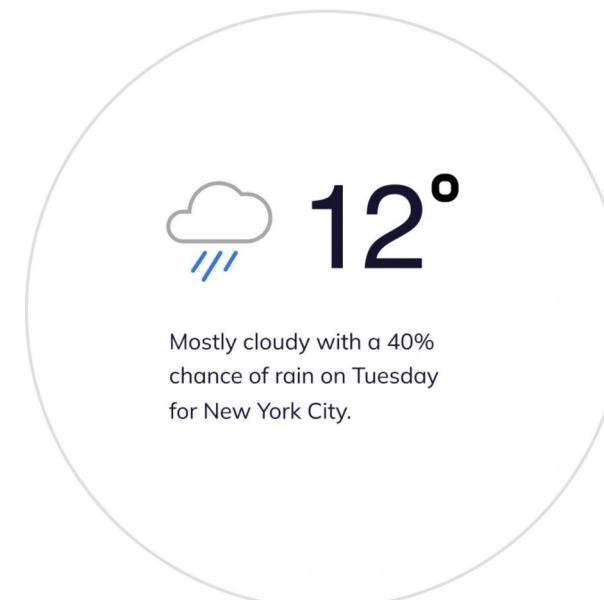


Nowcasting - client oriented with AI

- Civil defense
- Specific users

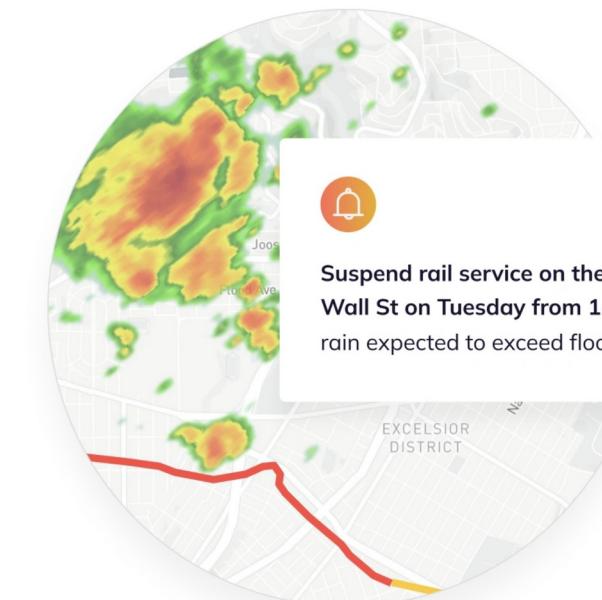
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Weather Forecast



vs

Weather Intelligence



GOES-10 26-27 April 2007

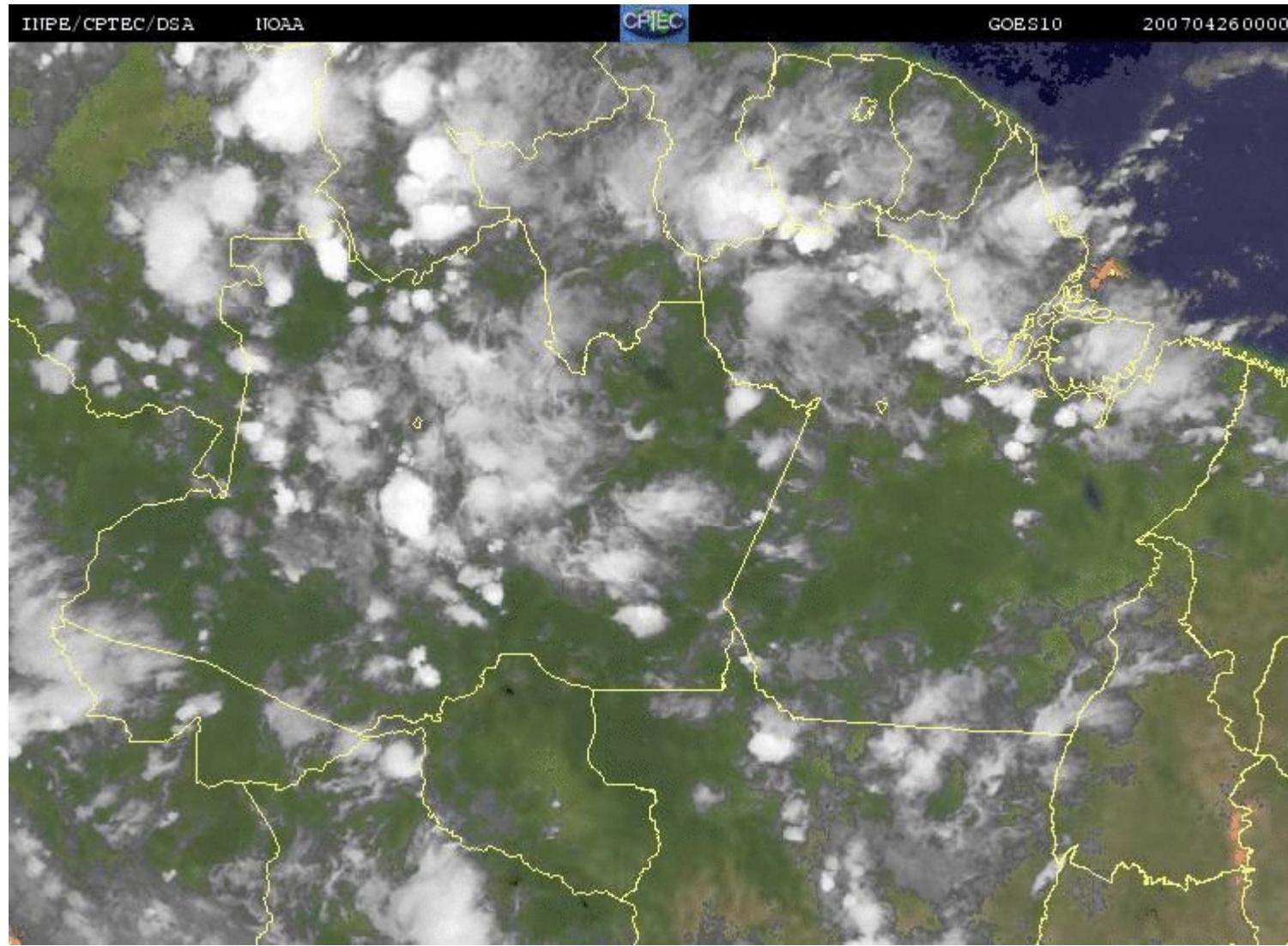


Image provided
by Saulo Fretias



Monthly Weather Review

≡ Volume 103: Issue 6 ▾

▼ Cited By

Editorial Type: Article

Article Type: Research Article

A Case Study of Apparent Gravity Wave Initiation of Severe Convective Storms

Louis W. Uccellini

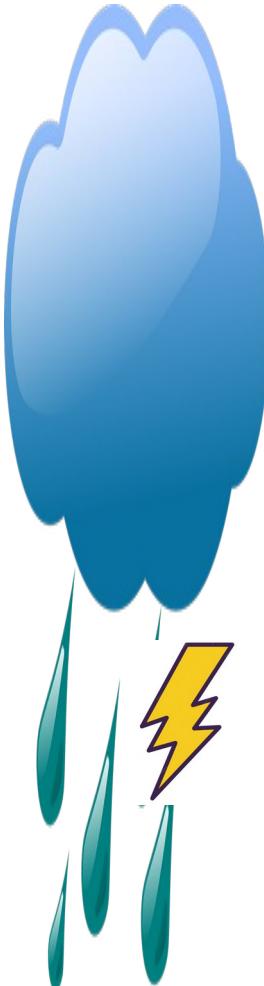
Print Publication: 01 Jun 1975

DOI: [https://doi.org/10.1175/1520-0493\(1975\)103<0497:ACSOAG>2.0.CO;2](https://doi.org/10.1175/1520-0493(1975)103<0497:ACSOAG>2.0.CO;2)

Page(s): 497–513



Volume 1, Issue 3
September 1994
Pages 215-231



Meteorological Applications

Science and Technology for Weather and Climate

Open Access



Article

A case study of a mesoscale trapped gravity wave accompanied by severe weather

Erik A Rasmussen

First published: September 1994 | <https://doi.org/10.1002/met.5060010304>

Recommended



Thank you!



vexus

The logo for rhama analysis is shown. It consists of a blue square icon followed by the word "rhama analysis" in a blue, sans-serif font.