CAP Experiences and Perspectives for its Rapid Implementation in Cuba

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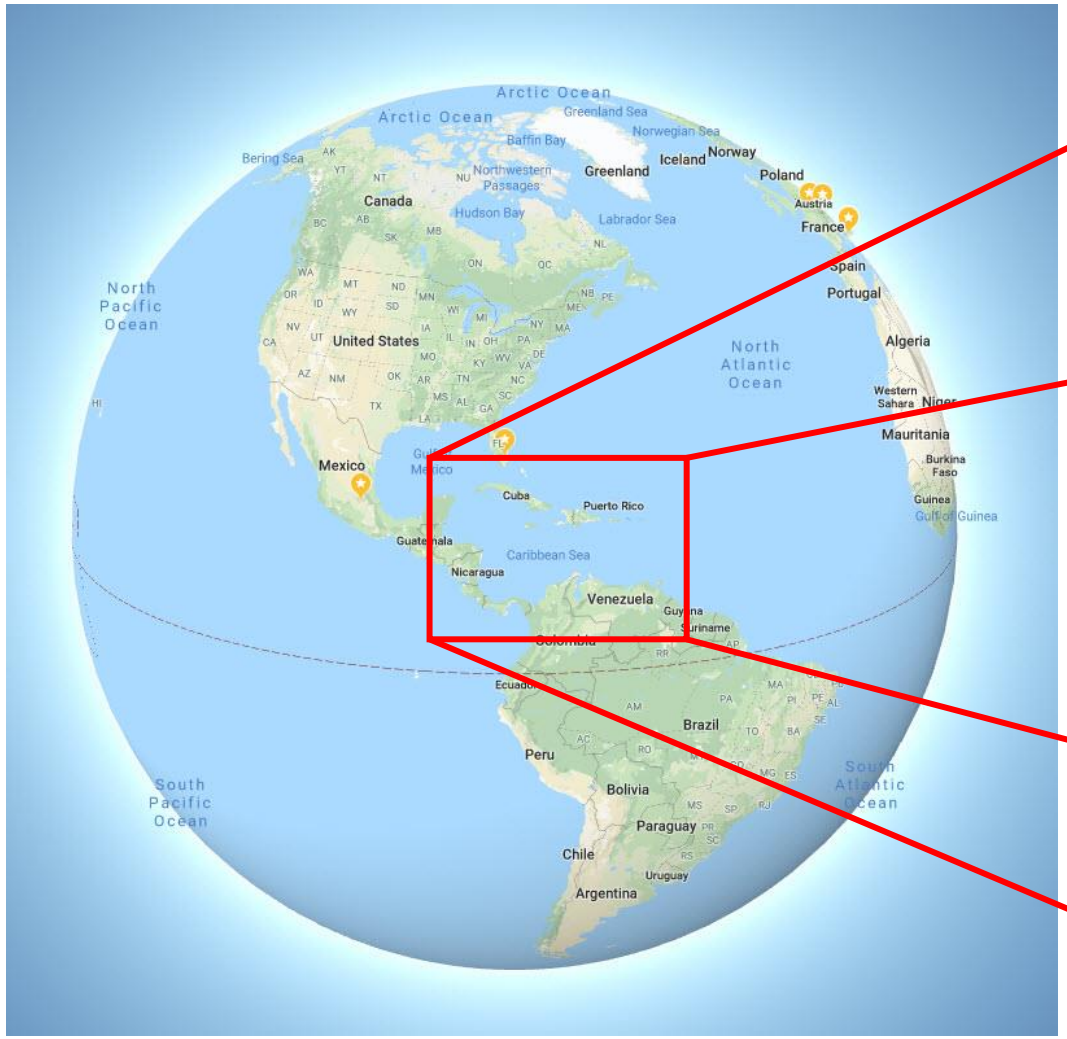
Head of National Project
to Improve Weather Watches and Warnings
Processes in Cuba

2019 Common Alerting Protocol (CAP)
Implementation Workshop,
Mexico City, MEXICO,
16-18 October, 2019

TOPICS

- Overview on Cuba.
- Cuban National Meteorological Service: Instituto de Meteorología.
- Why CAP Implementation is a Need in Cuba?.
- Difficulties for the Use of CAP in Cuban Met Service at an earlier time
- Evolution of Telecom and Internet in Cuba 2018 - 2019.
- Inmediate Plan to Implement CAP in Cuba in 2020.

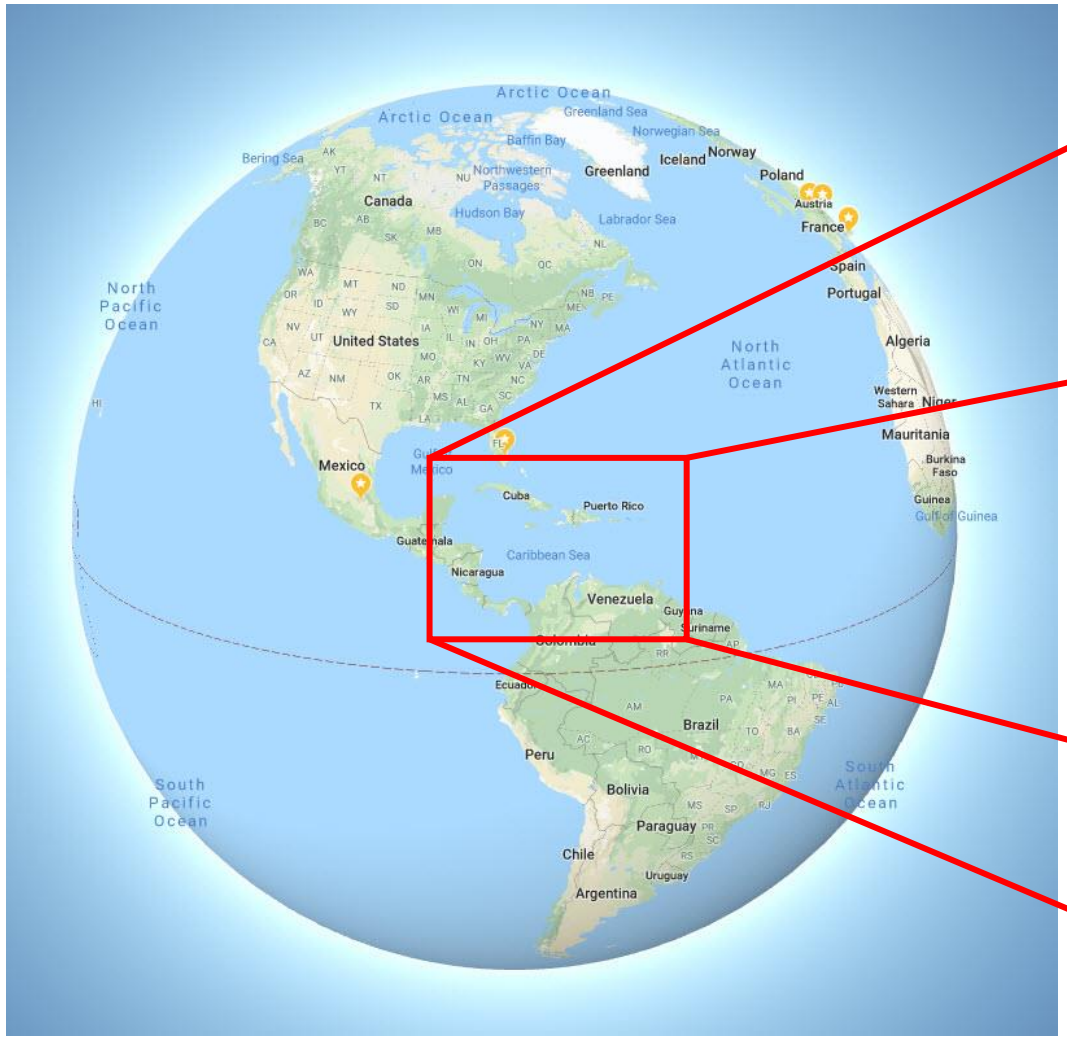
Overview on Cuba

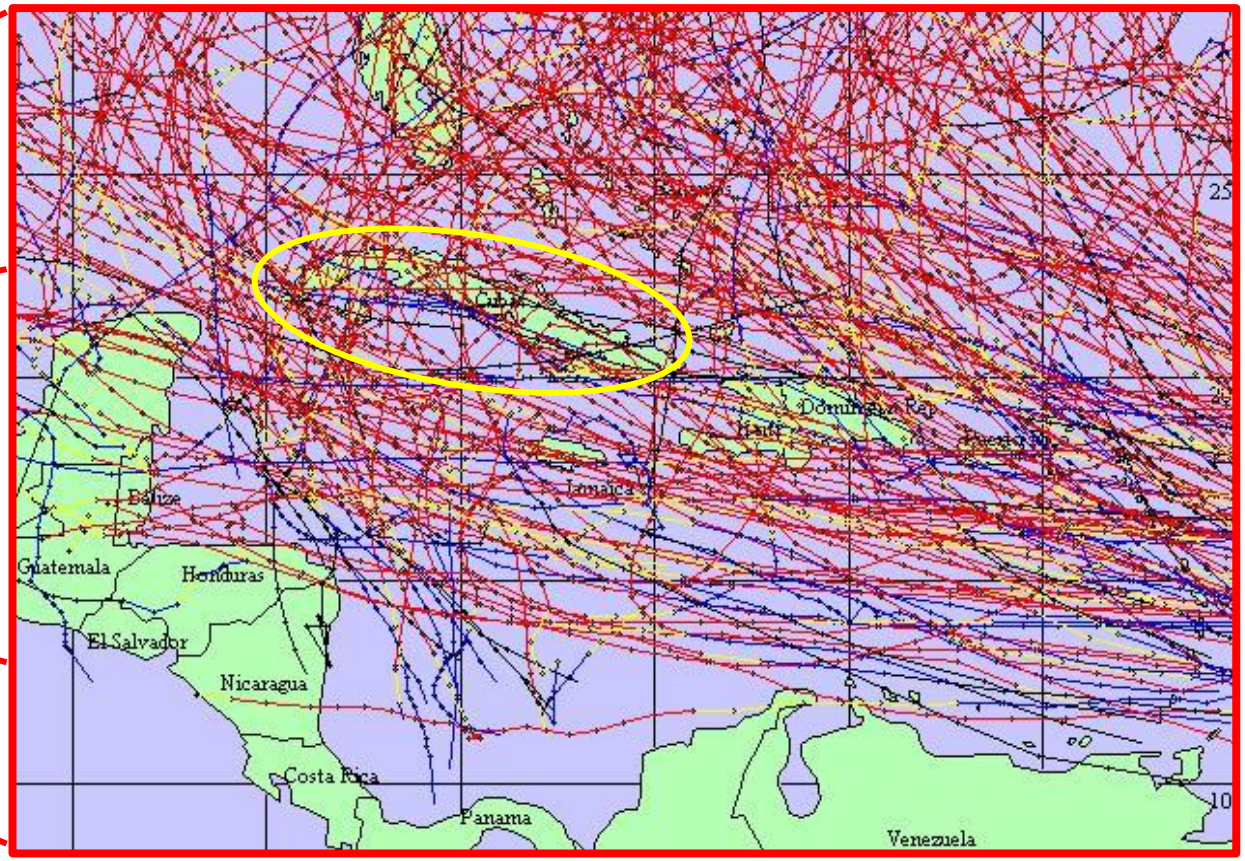


Source: Google Maps

Overview on Cuba

Main Weather Hazard: HURRICANES





Source: Google Maps

Overview on Cuba

- **TORRENTIAL RAINS**
  - Lowland Floodings
  - Flash Floodings in Cities
- **SEVERE THUNDERSTORM**
  - Flash Floods
  - Strong Local Winds
  - Hail
  - Tornado
- **STRONG WINDS**
- **COASTAL FLOODINGS**

Source: Google Maps

Overview on Cuba

Area:
110 922 km²

Coastline:
5 746 km

Population:
11 million

Capital:
Havana
2.5 million inh.

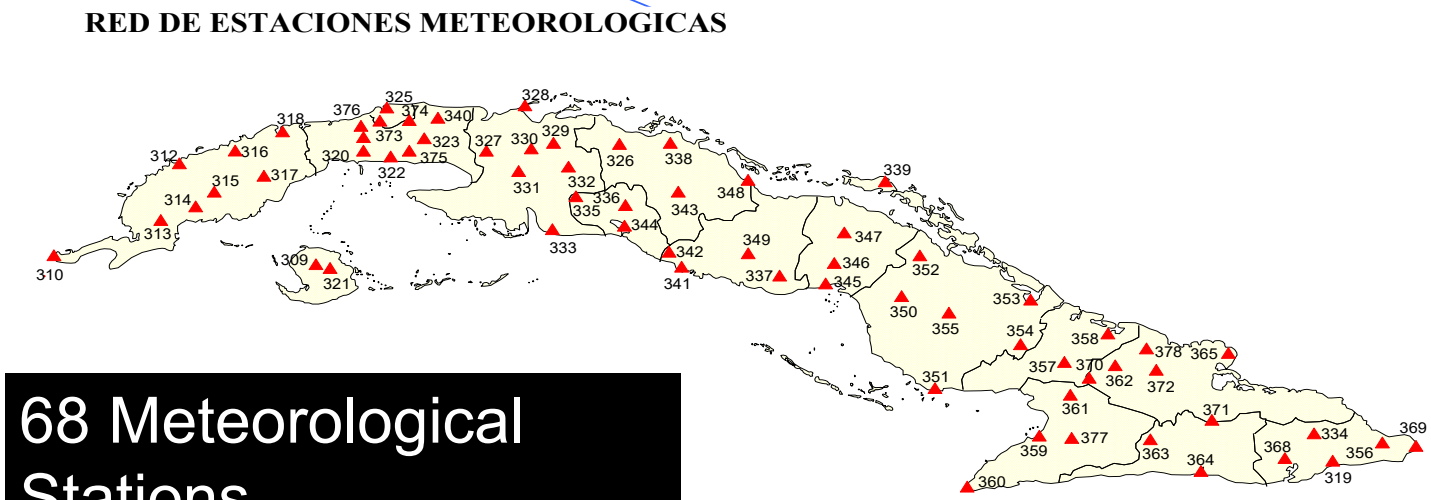
Cuban National Meteorological Service: Instituto de Meteorología

1 National Meteorological Center

16 Provincial Meteorological Centers

Cuban National Meteorological Service: Instituto de Meteorología

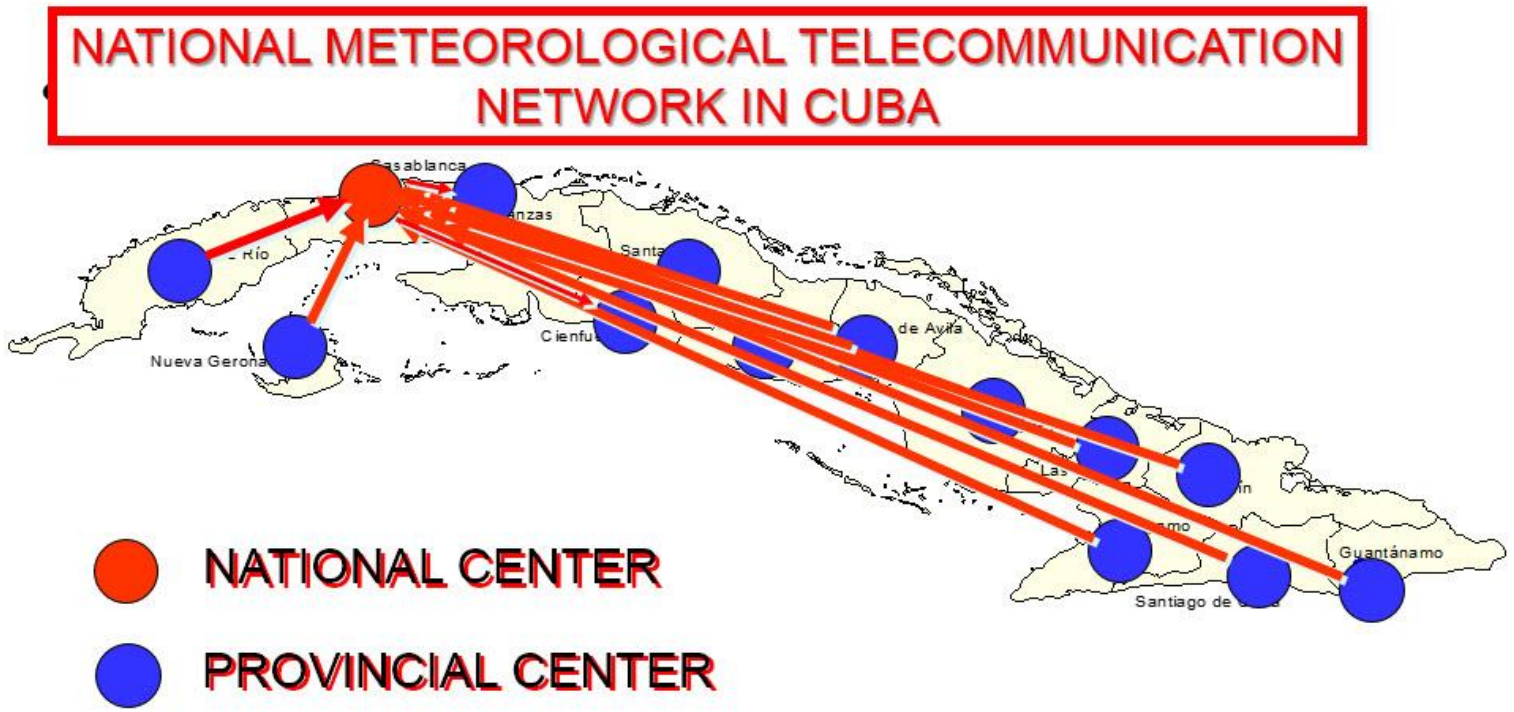
WEATHER STATION NETWORK IN CUBA



68 Meteorological Stations
1 Upper Air Sounding Station
2 Satellite Earth Station

Cuban National Meteorological Service: Instituto de Meteorología

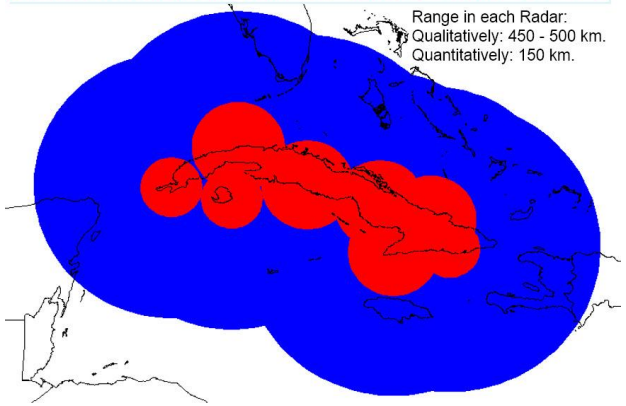
NMTN digitally provides all relevant exchange of meteorological information in the Country, linking the National Met. Center with all Provincial Met. Centers



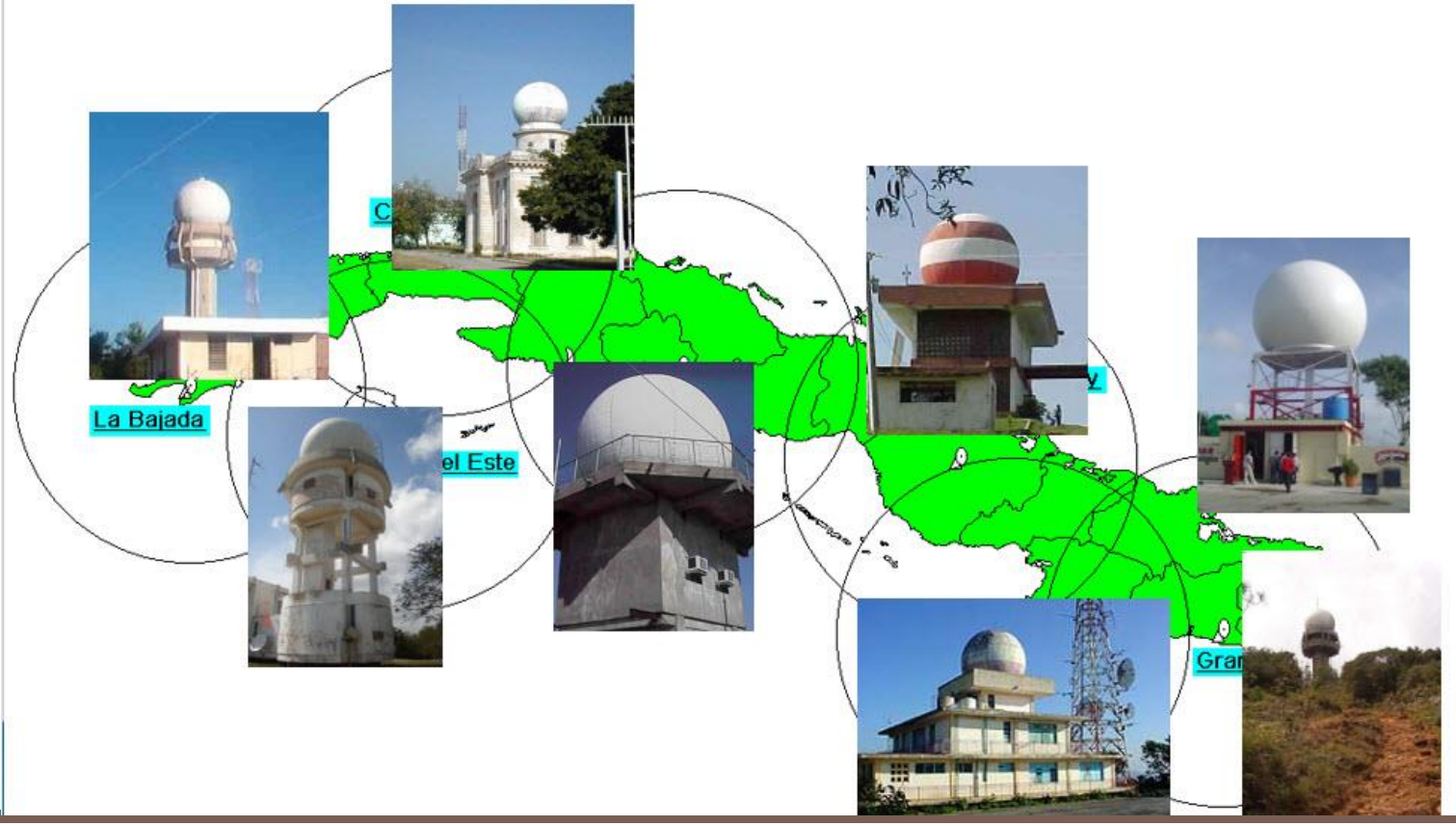
Cuban National Meteorological Service: Instituto de Meteorología

8 Weather Radars covers the entire Coutry and sea areas sorrounding Cuba

RADAR NETWORK COVERAGE IN CUBA



WEATHER RADAR NETWORK COVERAGE IN CUBA



Cuban National Meteorological Service: Instituto de Meteorología

DATA INPUT

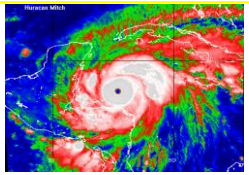
ANALYSIS AND NUMERICAL GUIDANCE

NATIONAL FORECAST CENTER

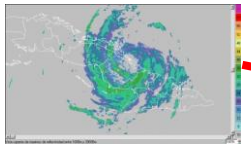
DIFUSSION OF WARNINGS

RESPONSE ACTIONS

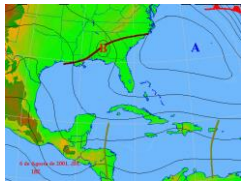
SATELLITES



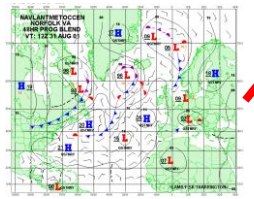
RADARS

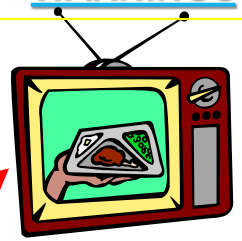


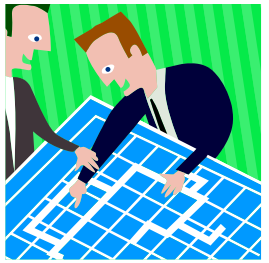
WEATHER STATIONS
UA SOUNDINGS
SHIPS
BUOYS
AIRCRAFTS

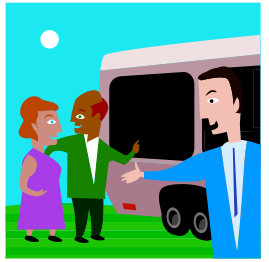


NUMERICAL MODELS

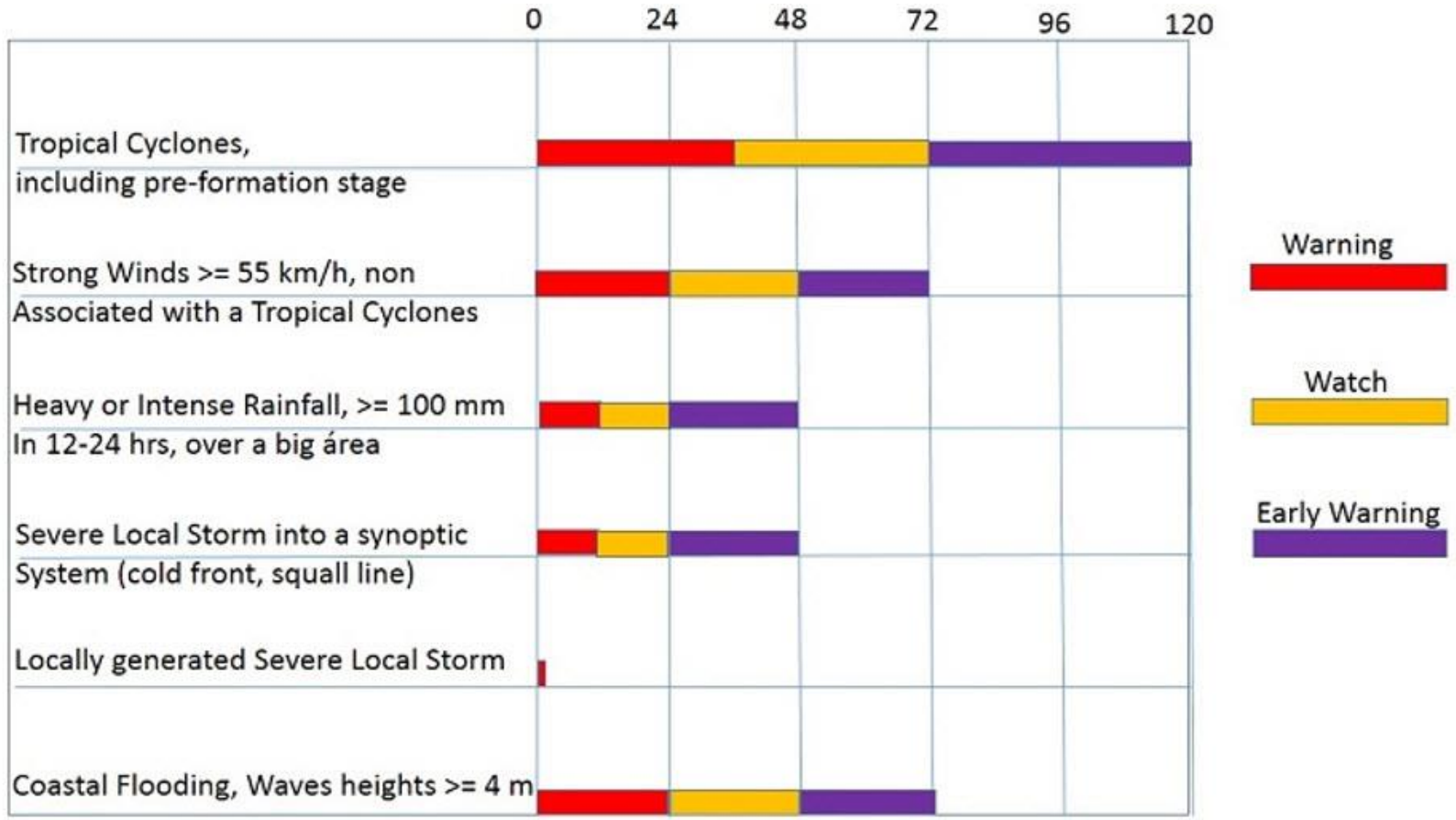








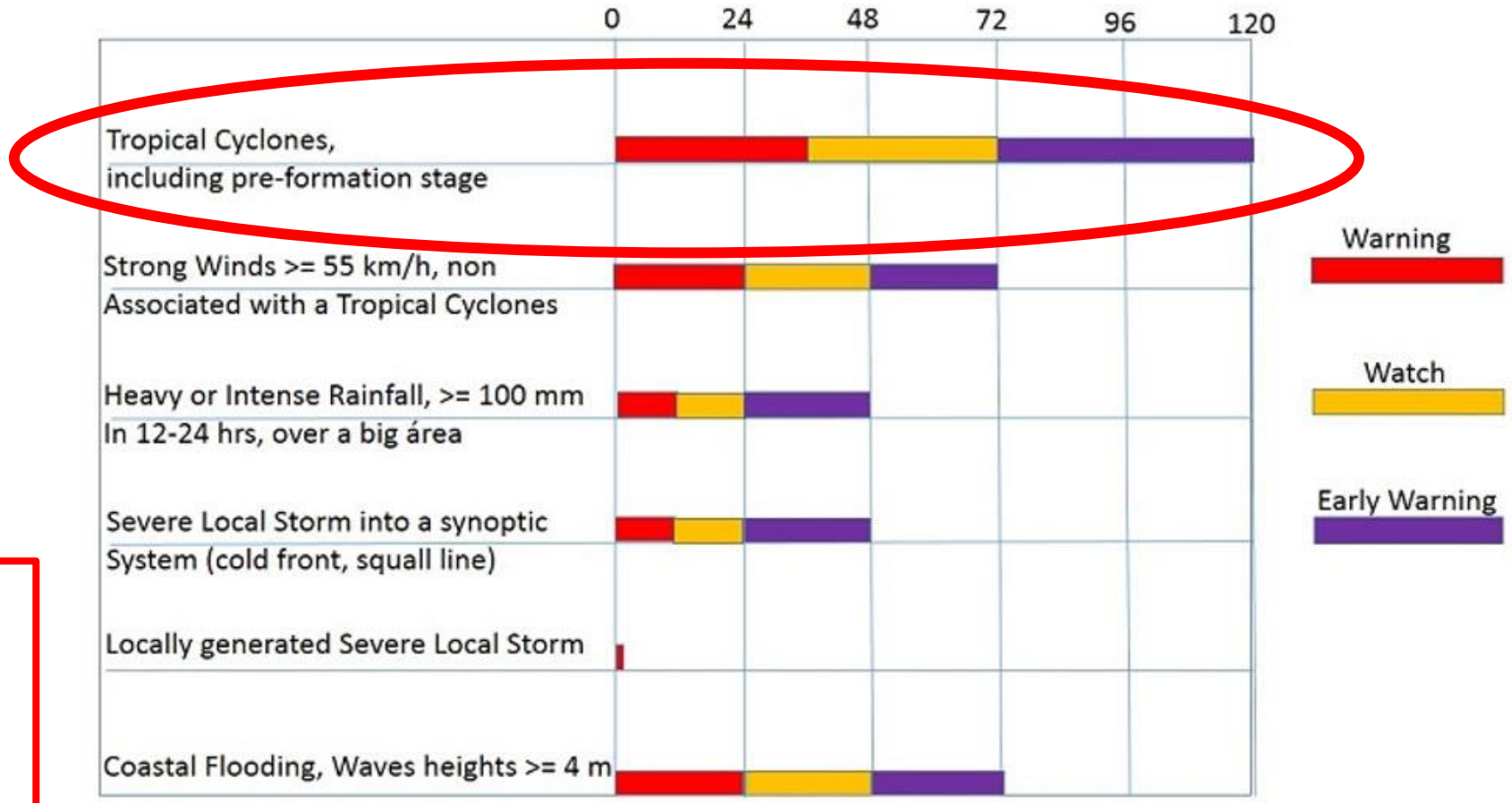
Why CAP Implementation is a Need in Cuba?



Leading Time for Watches and Warnings in Cuba

Why CAP Implementation is a Need in Cuba?

While Tropical Cyclones has a pretty good Watch and Warning System that has worked very well in years (just few or almost no fatalities in Cuba, even in very strong huracanes)

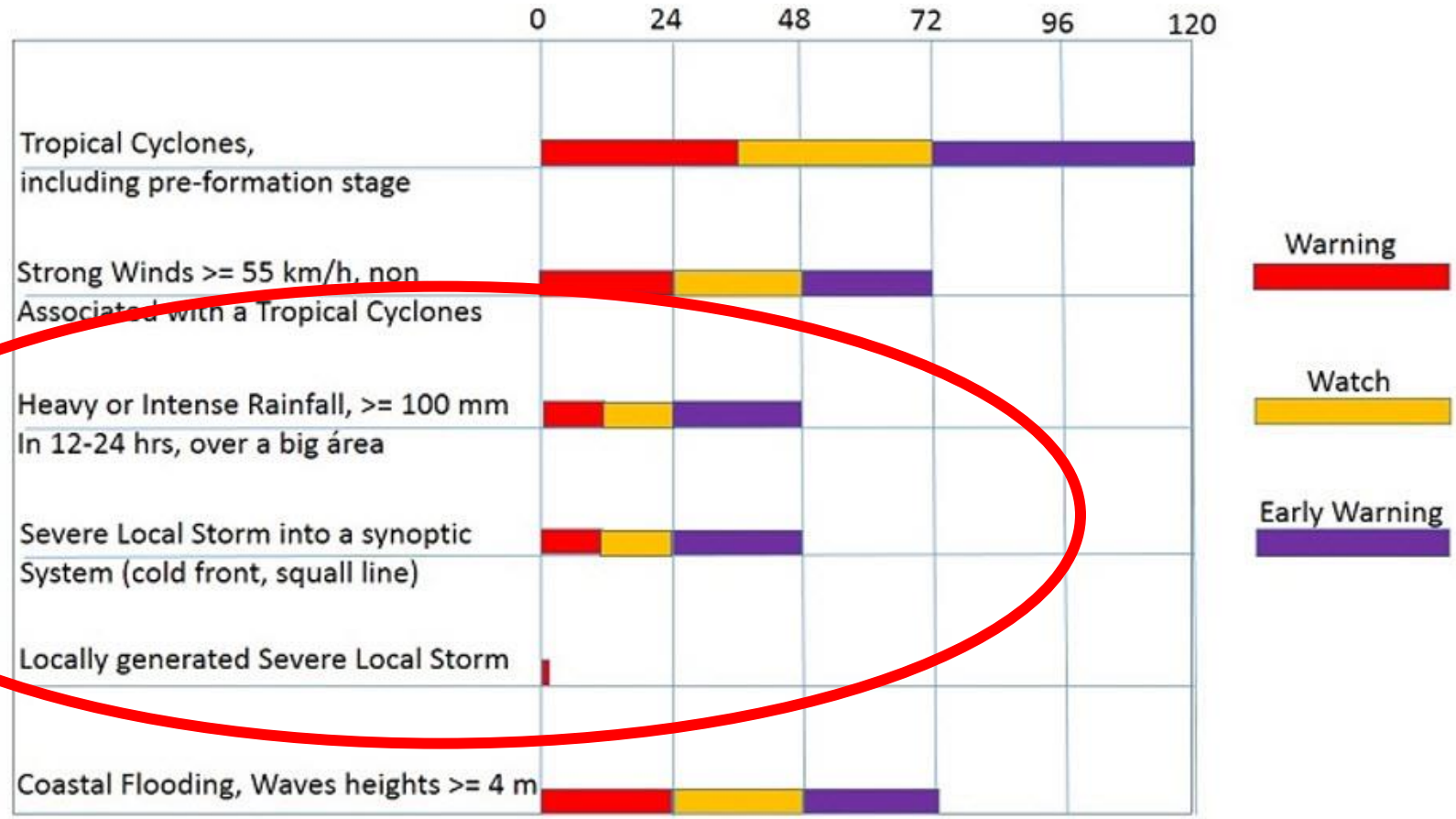


Leading Time for Watches and Warnings in Cuba

Why CAP Implementation is a Need in Cuba?

Others, generally have not that success, because lead times are shorter and diffusion of information is not as effective as in hurricanes

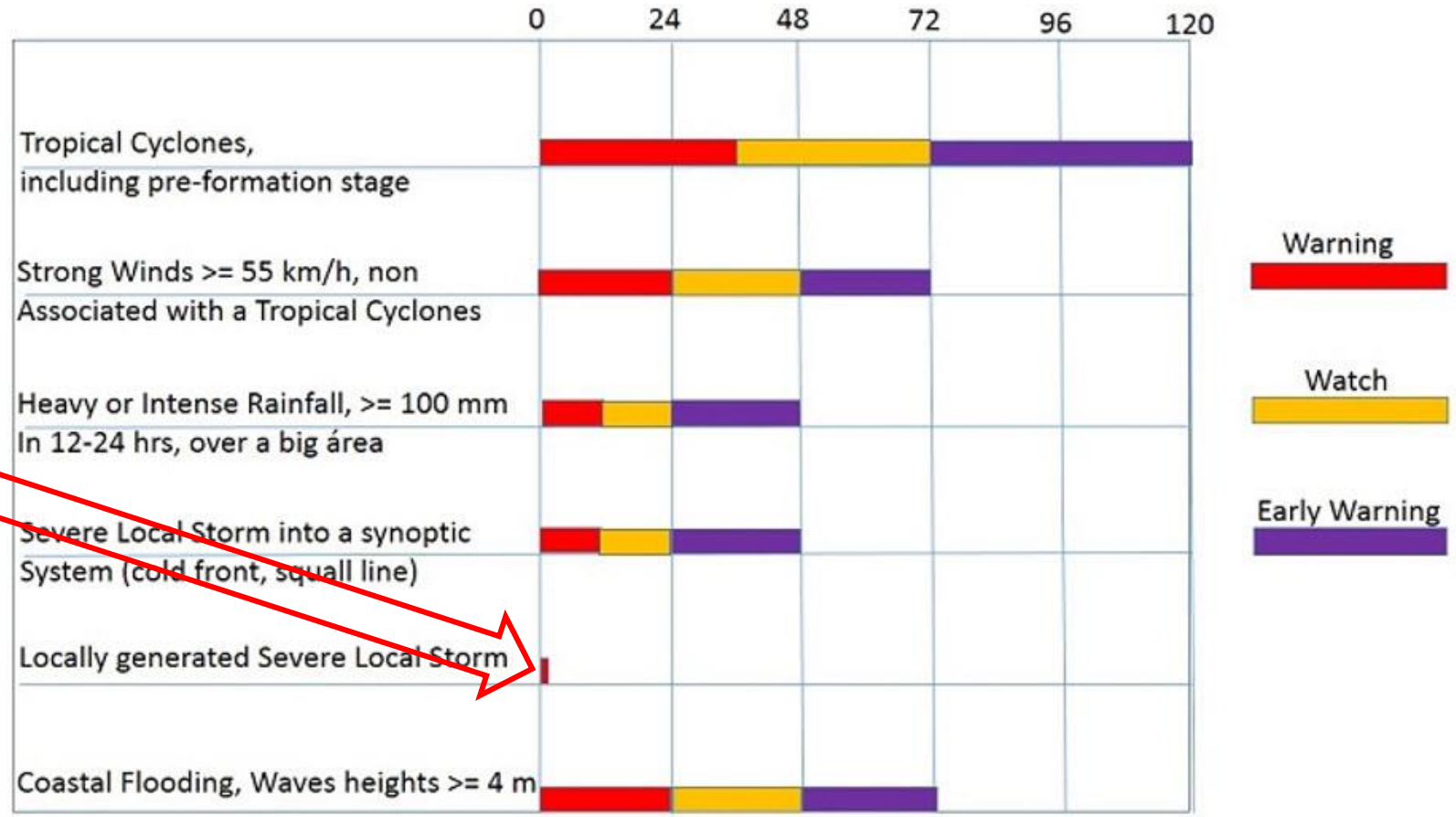
Leading Time for Watches and Warnings in Cuba



Why CAP Implementation is a Need in Cuba?

The main problem:
Local Severe Storm and its related features:
Flash Floods
Strong Winds
Wind Waves at the coast
Hail
Tornado

Leading Time for Watches and Warnings in Cuba



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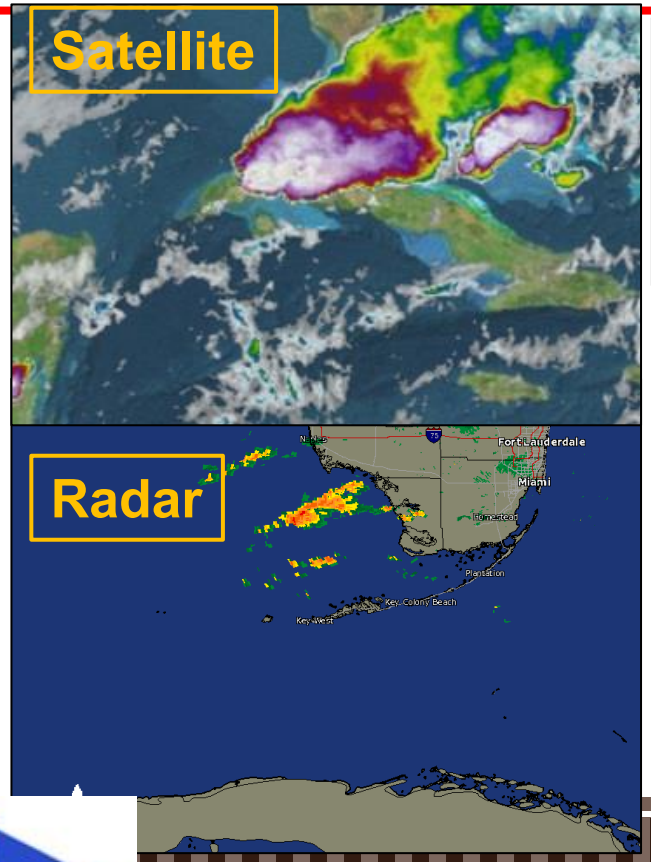
Leading Time for Watches and Warnings in Cuba

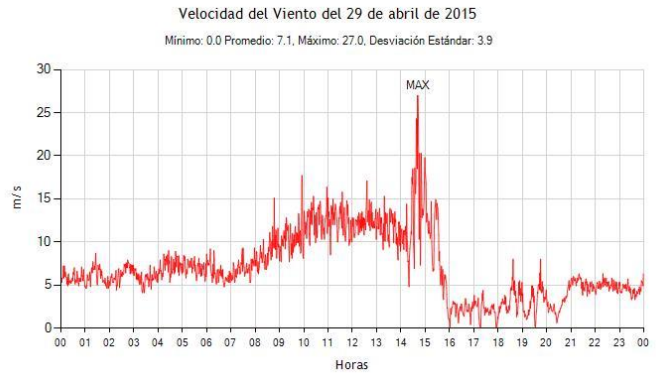
Just 30 minutes or less of Lead Time for Warning a Small Area

Why CAP Implementation is a Need in Cuba?

CAP is the only way to alert people in very fast developing dangerous weather.
An example was the squall line that effected Havana (> 2 million inhabitants) on April 29, 2015.



This severe local storm developed rapidly just in front of Havana.
Only a 20-min lead time to warn.... of course, the warning couldn´t go through..... Nobody received it before the event.



Winds were up to 27 m/s in a few minutes

Atmospheric Pressure dropped to 998 hPa

Why CAP Implementation is a Need in Cuba?

The main hazard in this event was the heavy and intense rainfall that disrupted all normal affairs in the 2-million inhabitants city, but fortunately with just one fatality

Heaviest precipitation fell in about 20 minutes.
Greatest amounts were recorded in downtown Havana:
239 mm in Plaza de la Revolución;
197 mm in Cerro;
188 mm in Loma de la Cruz;
186 mm in La Palma; and
171 mm in Habana del Este

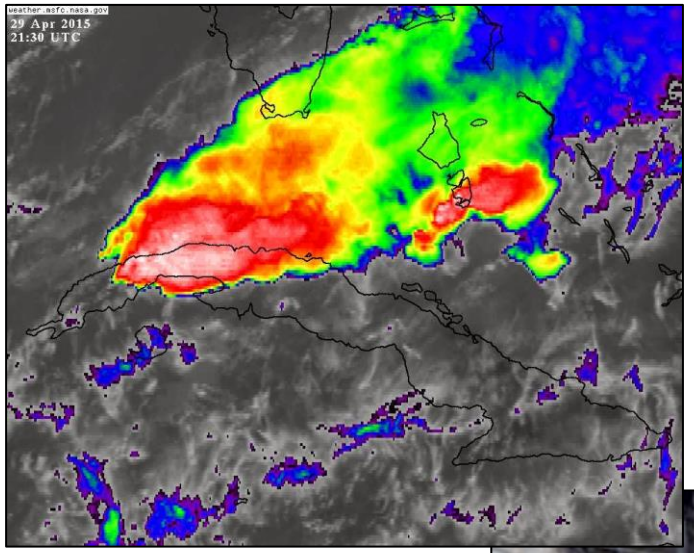
INSMET

Centro de Pronósticos INSMET

Why CAP Implementation is a Need in Cuba?

City normal life completely disrupted in 15 minutes

Why CAP Implementation is a Need in Cuba?



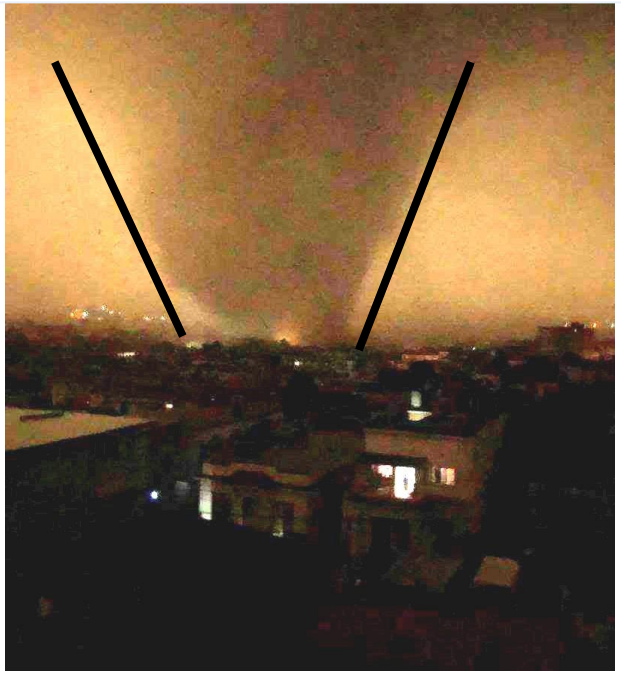
The most intense rainfall lasted less than half an hour

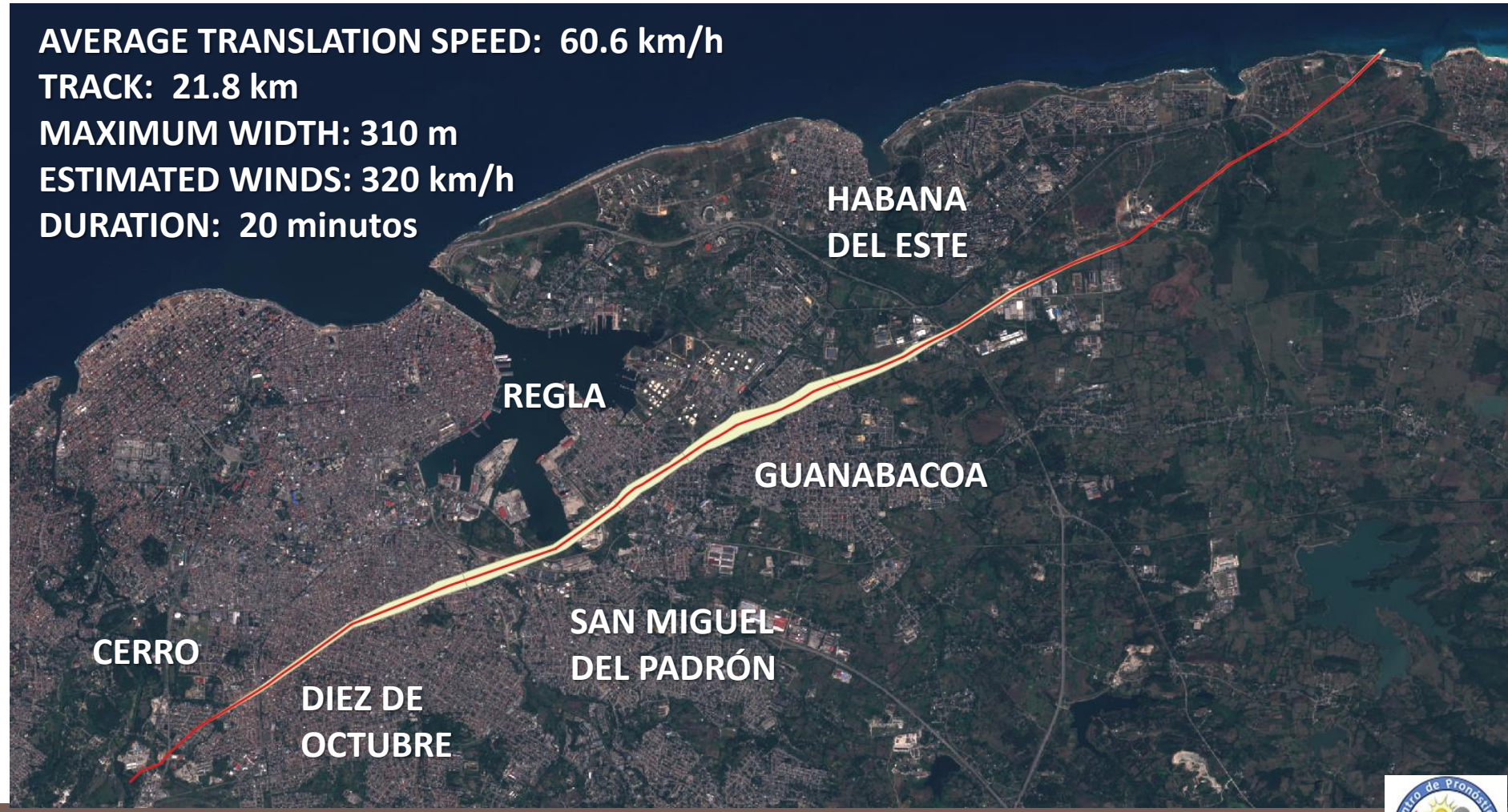
The night fell over a flooded city that was without electric power

Havana completely under water

Why CAP Implementation is a Need in Cuba?

Severe Local Storm with Very Strong EF-4 Tornado hits Havana City January 27, 2019





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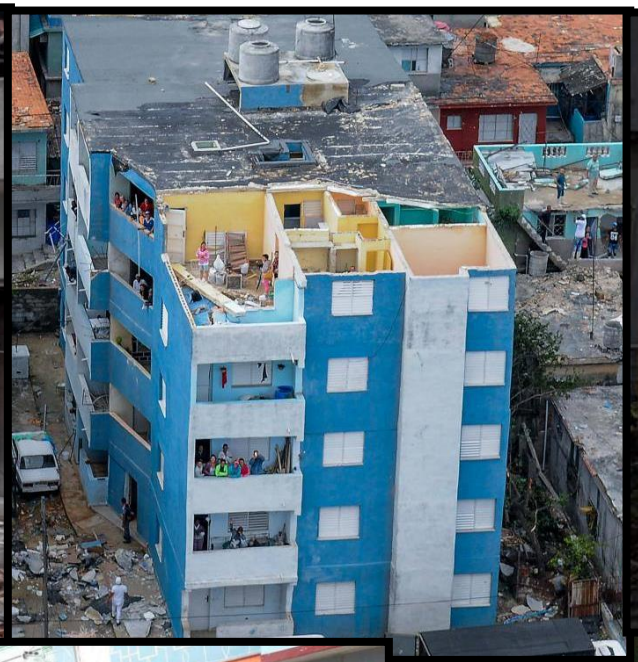


INSMET

Centro de Pronósticos INSMET

Why CAP Implementation is a Need in Cuba?

People´s Life Completedly Changed in those 20 minutes

Fortunatedly only 7 fatalities, but the Tornado swatch área was almost completedly destroyed

There was NO WARNINGS, other than general conditions favored severe thunderstorm áreas to develop in Western Cuba

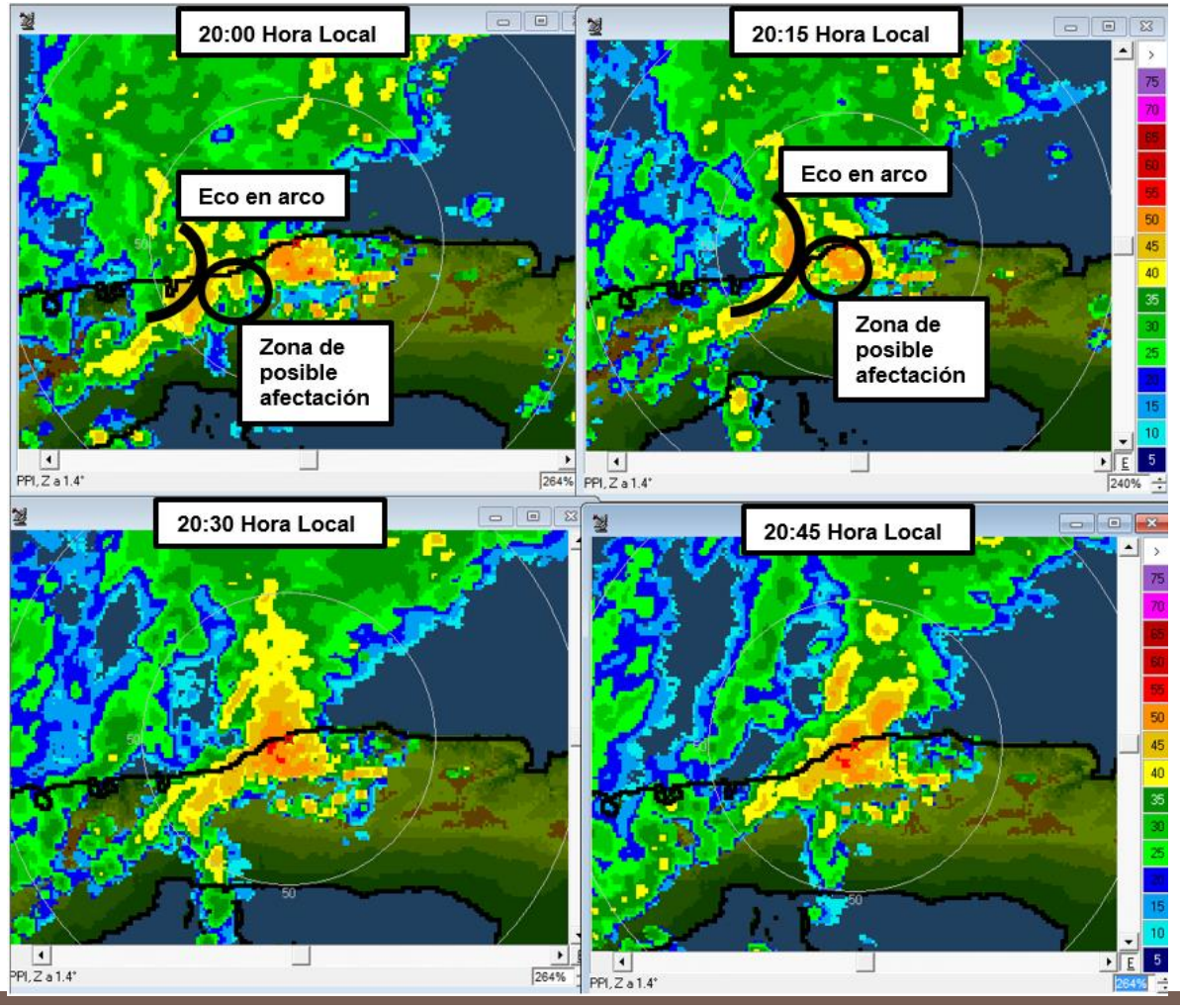
INSMET

Centro de Pronósticos INSMET

Why CAP Implementation is a Need in Cuba?

Havana Weather Radar Imagery

20:00 to 20:45 January 27, 2019.



With this information and CAP, something else could have been done to warn people on an impending threat

Difficulties for the Use of CAP in Cuban Met Service at an earlier time

At InsMet:

- ✓ Internal tests were made in 2015 using InsMet web page, with no graphic.
- ✓ People that were trained al that momento, later moved to other positions outside InsMet.
- ✓ Smart Alert Finnish software was installed in 2017, but technical problems prevented it to be fully operational.

Difficulties for the Use of CAP in Cuban Met Service at an earlier time

Country Infrastructure (2014 – 2018) also prevented the use of CAP:

- ✓ Internet not widely used in the Country; Only available for a small amount of people, roughly 3 million users, 25 % of 11.3 million inhabitants in 2014.
- ✓ Very Slow Internet connection, normally no wide band.
- ✓ Very high cost for one-hour surfing of the web, around 8 - 9 % of an average monthly salary after a 50 % price off being in effect since July 2015.
- ✓ Cell phone are available for many people, but still below 40 % of the population.
- ✓ No Internet Connection in cell phones.

Evolution of Telecom and Internet Cuba in late 2018 and 2019

Telecom scenario is rapidly changing in Cuba

Evolution of Telecom and Internet Cuba in late 2018 and 2019

Million Mobile Lines

Million with Data Access

Wi-Fi Areas

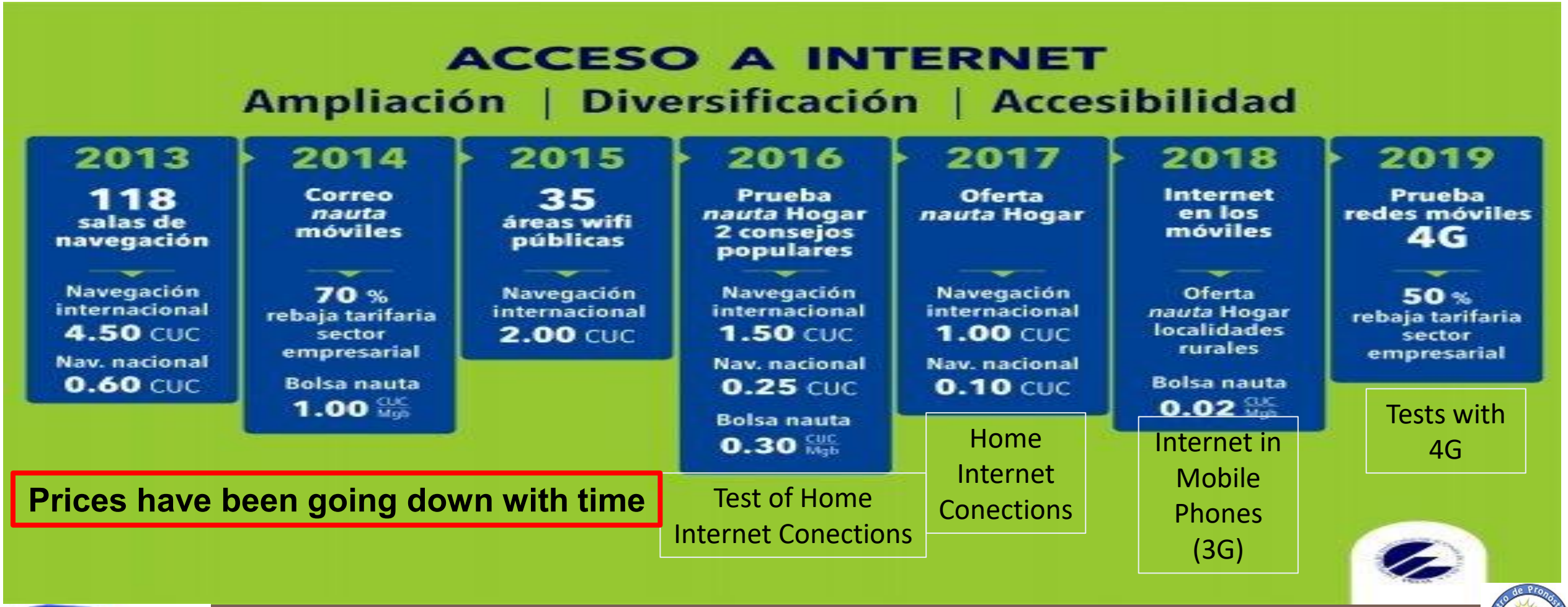
Surfing Places

Permanent Accounts

Home Internet Connections

New Contracts of Conectivity to Enterprises

Evolution of Telecom and Internet Cuba in late 2018 and 2019



Prices have been going down with time

Test of Home Internet Conections

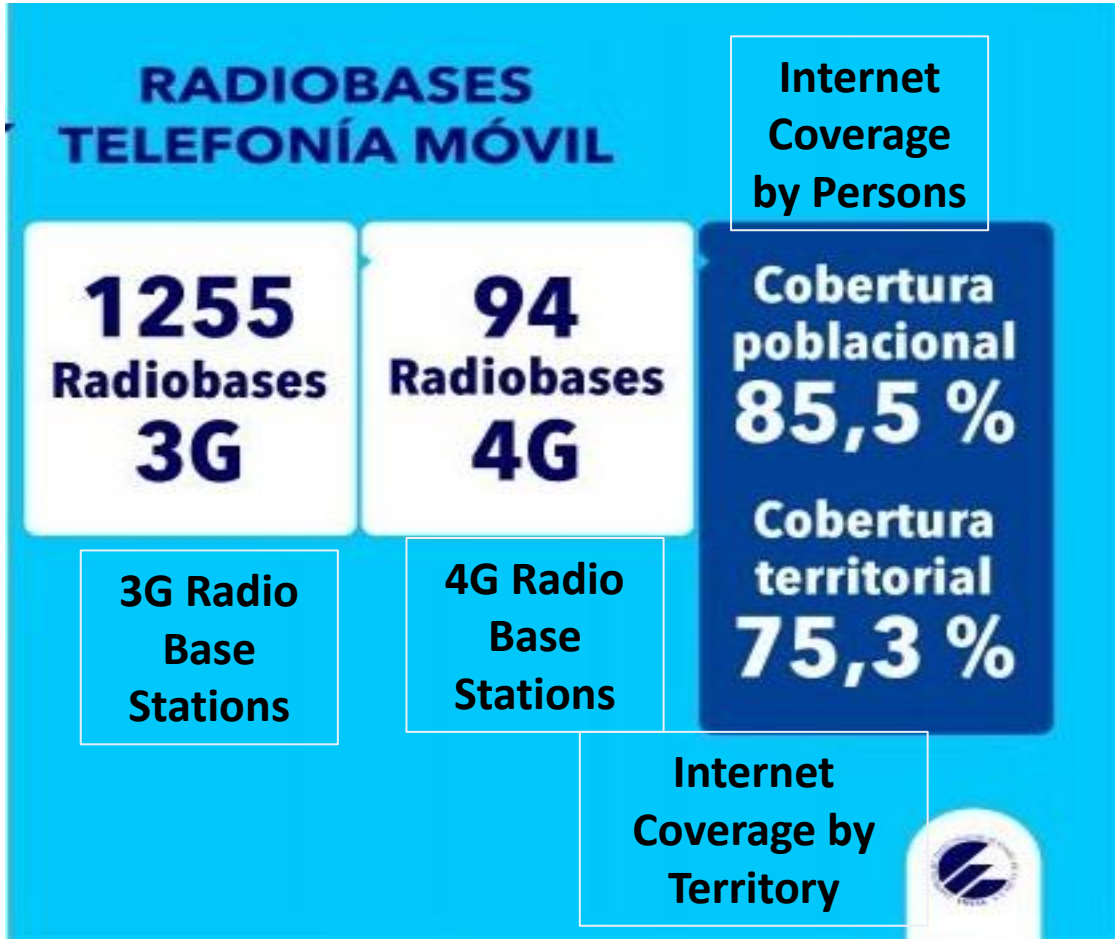
Home Internet Conections

Internet in Mobile Phones (3G)

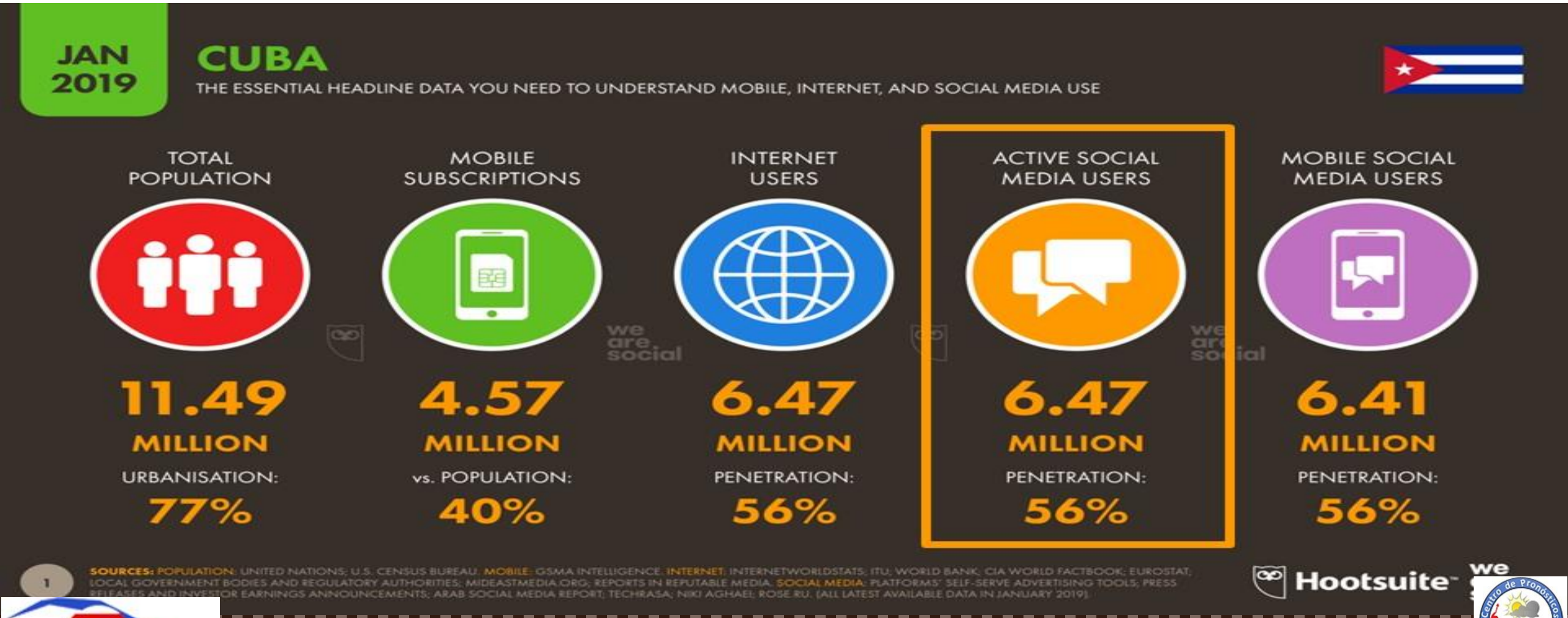
Tests with 4G

Evolution of Telecom and Internet Cuba in late 2018 and 2019

At the End of 2019



Evolution of Telecom and Internet Cuba in late 2018 and 2019



Evolution of Telecom and Internet Cuba in late 2018 and 2019

Conditions favor InsMet towards the Use of CAP in a New Fashion National Watch and Warning System

Inmediate Plan to Implement CAP in Cuba 2020

- The National Forecast Center of InsMet, as well as the 16 Forecast Departments in Provinces has the mandate to issue Weather Watches and Warnings for their respective territories of responsability, National or Provincial, in a completedly transparent and coordinated way, as it is stated in the National Operational Plan.

- CAP comes as a very useful tool to acomplish that mandate.

- The implementation of CAP in Cuba has been framed into a National Project, already approved by the Scientific Council of InsMet, with the Goal to improve the Weather Watches and Warnings System in the Country along 2020.

Some of the Tasks that have been identified into the Project Plan are the following:

Inmediate Plan to Implement CAP in Cuba 2020

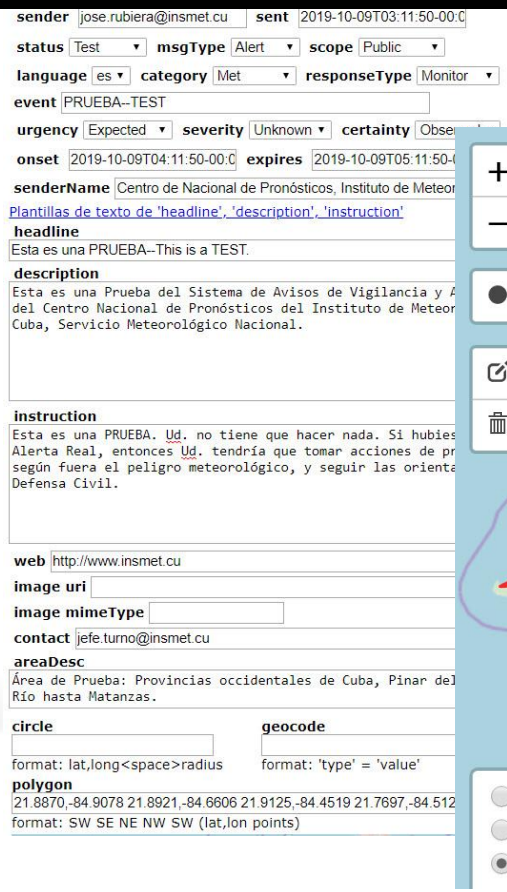
- To Train specialist at InsMet National Forecast Center on the National issuance of CAP Alerts
- To Establish the Official issuance of CAP Alerts in the InsMet WEB and RSS feeds.
- To Train specialist at the Provincial Meteorological Centers to issue CAP Alerts for their territory of responsability.

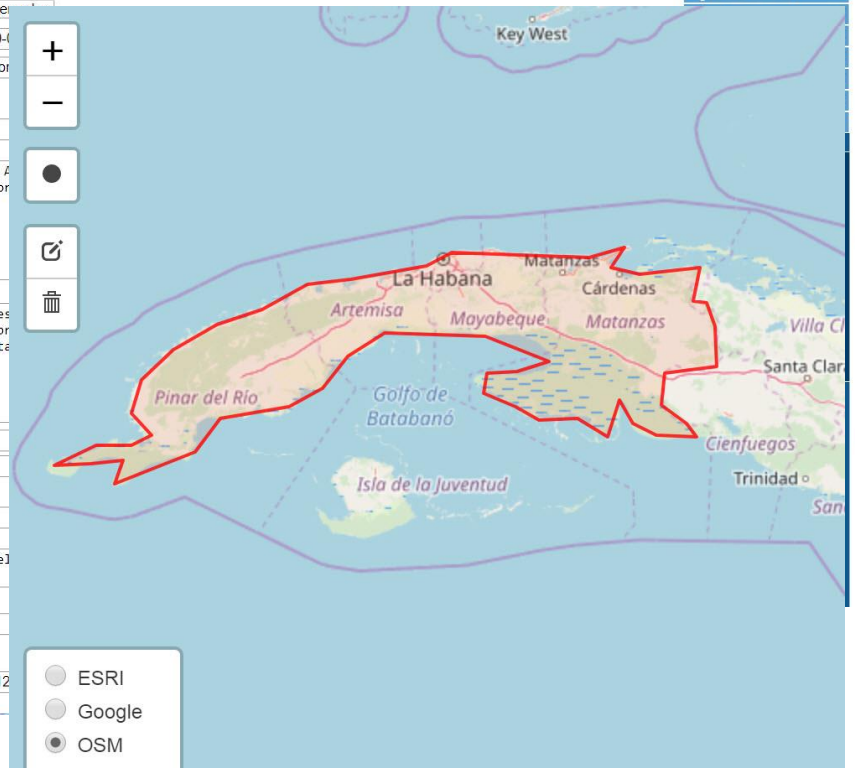
Inmediate Plan to Implement CAP in Cuba 2020

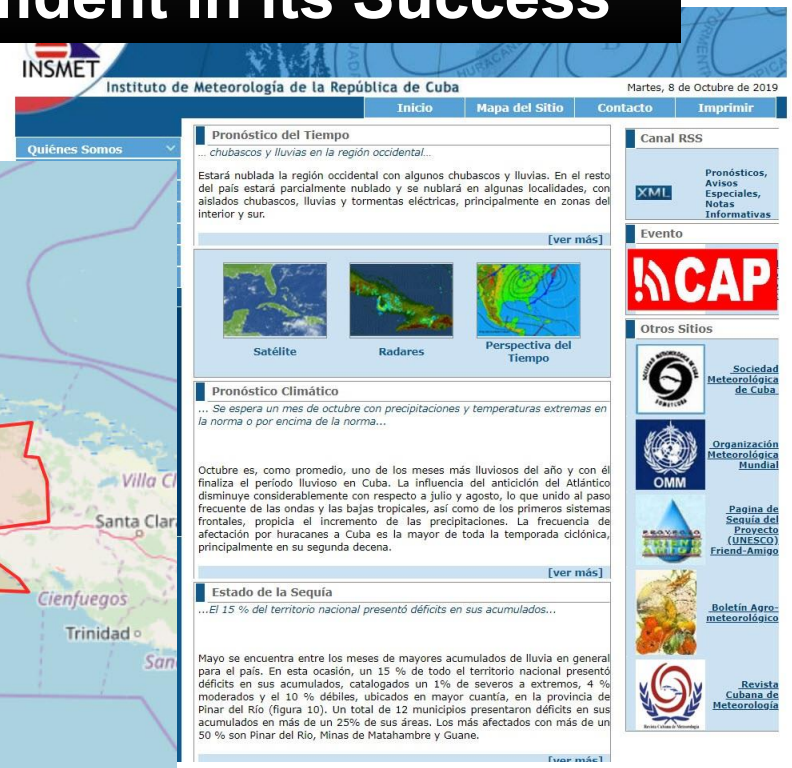
- To Begin displaying also Provincial CAP Alerts through the WEB and RSS feeds in the Provincial sites as well as in the InsMet website.
- To Develop a National App to be installed into Intelligent Phones to automatically display Cuban CAP Warnings, both National and Provincial, as a Push Service through that free App, taking into account the basis of user location.

Inmediate Plan to Implement CAP in Cuba 2020

A First Step, a Steady Purpose; we are Confident in its Success







Thank you, Muchas Gracias

José Rubiera, Ph.D
Head of National Project:
¨Improving Weather Watches and Warnings Processes in Cuba¨

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