Servicio Meteorológico Nacional
Argentina

Heatwave Early Warning System in Argentina

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First Global Forum for Heat and Health. Hong Kong, 17-20 December 2018.

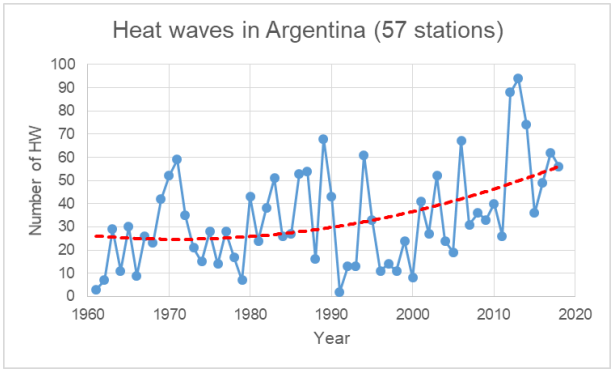
National Meteorological Service

Ministry of Health and Social Development

Mortality and Heat Waves research (2015)

Summer 2013-2014

- Significant increases in the mortality rate
- 1877 deaths in excess
- The death risk significantly increased in 13 of the 19 states analyzed



Evidence of the increase in the frequency, intensity and duration of heat waves (HW)

Heatwave Early Warning System

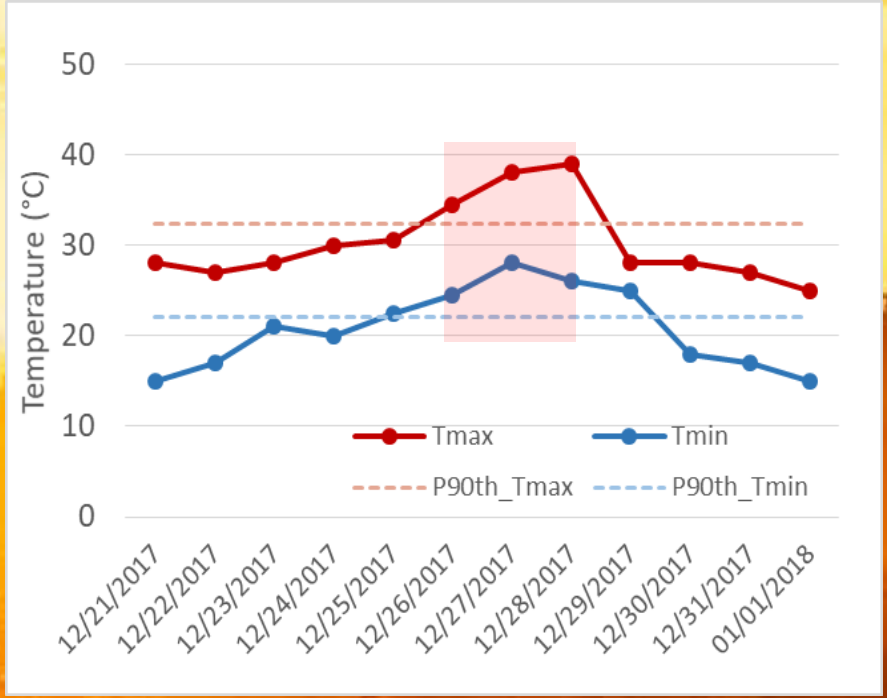
What is a Heat Wave?

The Argentinian Meteorological Service define a heat wave as a period of time in which

Tmax ≥ 90th percentile
Tmin ≥ 90th percentile

(*at least for 3 consecutive days*)

90th percentile are calculated based on daily data from October to March (1961-2010 period).



https://www.smn.gob.ar/smn_alertas/olas_de_calor

Green	Normal temperatures (observed and predicted). No effect on health. There is no danger on the population´s health.
Yellow	Heat wave forecast. Mild-moderate effect on health. Heat waves can be dangerous, especially for risk groups
Orange	Heat wave observed. Moderate-high effect on health. Heat waves can be very dangerous, especially for risk groups.
Red	Intense or persistent heat wave. Extreme effect on health. They can affect all healthy people, and not just risk groups.

*To trigger an alert the System uses **observed** and **forecasted** maximum and minimum temperatures and **persistence**.*

- ✓ Daily alert
- ✓ 1st October to 31 March
- ✓ 57 cities
- ✓ Each day at afternoon
- ✓ Alert is valid for 24 hours

Examples of how each alert is activated..

Yellow alert	
Case i. HW forecast for the next 3 days.	Forecast (24hs) ≥ P90
	Forecast (48hs) ≥ P90
	Forecast (72hs) ≥ P90
Case ii. 1 day with HW conditions is observed and there is a HW forecast for the next 2 days.	Obs(0) ≥ P90
	Forecast (24hs) ≥ P90
	Forecast (48hs) ≥ P90
Case iii. 2 days with HW conditions are observed and there is a HW forecast for the next day.	Obs(-1) ≥ P90
	Obs(0) ≥ P90
	Forecast (24hs) ≥ P90
Case iv. 2 days with HW conditions are observed, 1 day close to HW conditions (today) and there is a HW forecast for the next day.	Obs(-2) ≥ P90
	Obs(-1) ≥ P90
	Obs(0)+1°C ≥ P90
	Forecast (24hs) ≥ P90
Case v. 3 days with HW conditions are observed and Tmin forecast is higher than P90 for the next day.	Obs(-2) ≥ P90
	Obs(-1) ≥ P90
	Obs(0) ≥ P90
	Forecast (24hs) ≥ P90_Tmin

Orange alert	
Case i. 2 days with HW conditions are observed and there is a HW forecast for the next day (Tmax forecast is higher than P99).	Obs(-1) ≥ P90
	Obs(0) ≥ P90
	Forecast (24hs) ≥ P90_Tmin
	Forecast (24hs) ≥ P99_Tmax
Case ii. A HW is observed and there is a HW forecast for the following day.	Obs(-2) ≥ P90
	Obs(-1) ≥ P90
	Obs(0) ≥ P90
	Forecast (24hs) ≥ P90
Case iii. 4 days with HW conditions are observed and Tmin forecast is higher than P90 for the next day.	Obs(-3) ≥ P90
	Obs(-2) ≥ P90
	Obs(-1) ≥ P90
	Obs(0) ≥ P90
	Forecast (24hs) ≥ P90_Tmin

Red alert	
Case i. 3 days with conditions of extreme HW are observed, exceeding P95 at Tmax, and there is a HW forecast for the next day (Tmax forecast higher than P99).	Obs(-2) ≥ P95_Tmax
	Obs(-1) ≥ P95_Tmax
	Obs(0) ≥ P95_Tmax
	Forecast (24hs) ≥ P90_Tmin
	Forecast (24hs) ≥ P99_Tmax
Case ii. 4 days with HW conditions are observed and there is a HW forecast for the next day (Tmax forecast is higher than P99).	Obs(-3) ≥ P90
	Obs(-2) ≥ P90
	Obs(-1) ≥ P90
	Obs(0) ≥ P90
	Forecast (24hs) ≥ P90_Tmin
	Forecast (24hs) ≥ P99_Tmax

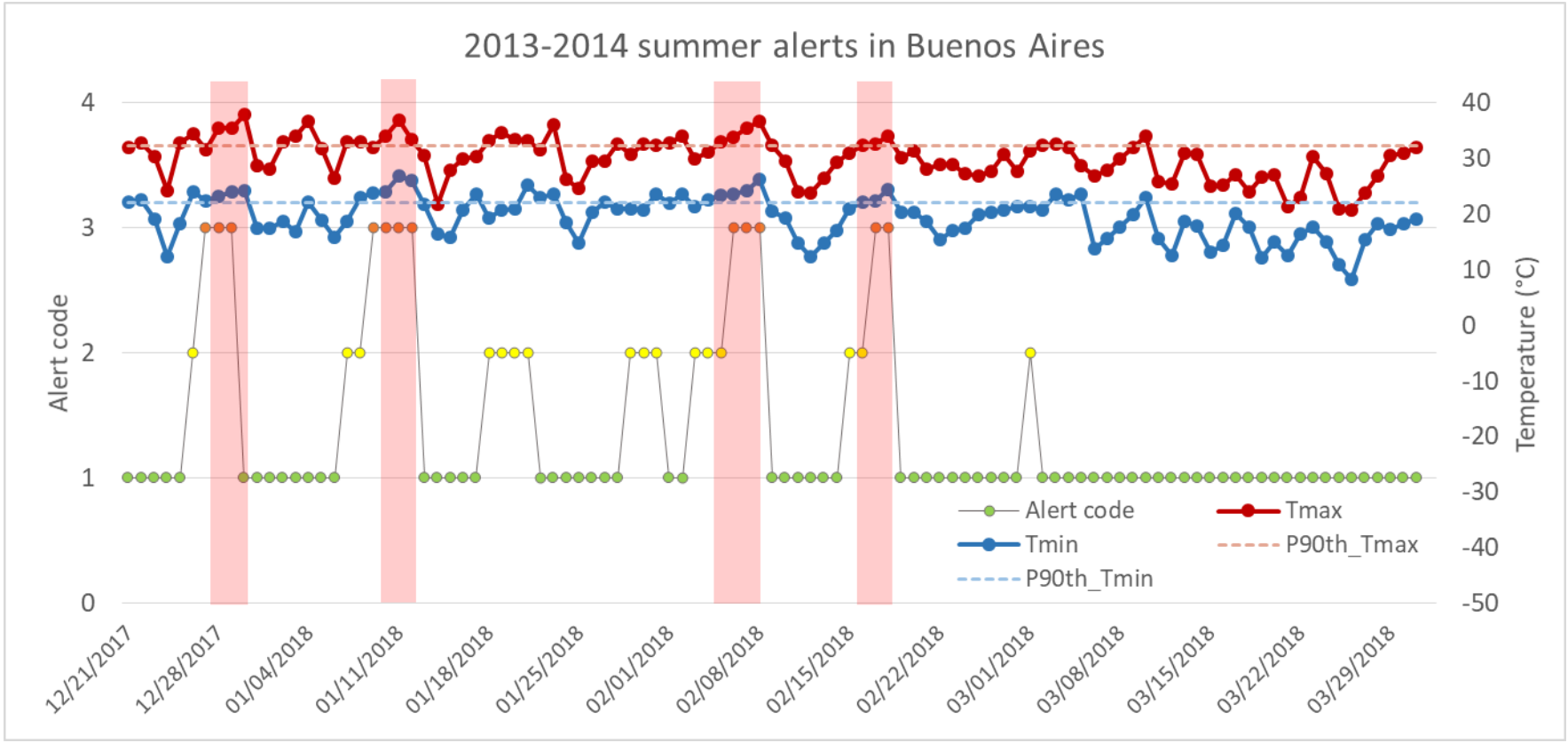
Non-weather issues: power or water shortages

Ministry of Health and Social Development → Recommendations for
- general population
- vulnerable groups

→
- web site of the Ministry
- mass media campaign

communication flow diagram (development phase) — in order to → Inform the state of HW alert

More details about the System: **goo.gl/xjXVWc**


2013-2014 summer alerts in Buenos Aires
Alert code
Temperature (°C)
4
3
2
1
0
40
30
20
10
0
-10
-20
-30
-40
-50
12/21/2017
12/28/2017
01/04/2018
01/11/2018
01/18/2018
01/25/2018
02/01/2018
02/08/2018
02/15/2018
02/22/2018
03/01/2018
03/08/2018
03/15/2018
03/22/2018
03/29/2018
Alert code
Tmax
Tmin
P90th_Tmax
P90th_Tmin

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Thank you!