Facing weather risks during The Floating Piers

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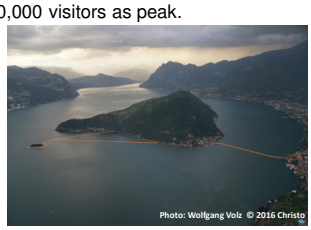
Motivation and expected outcomes

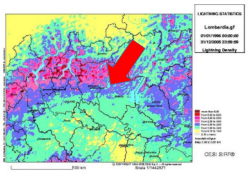
The Floating Piers has been a site-specific work of art that took place in Lake Iseo, Lombardia, Italy during early summer 2016.

It consisted of 100,000 square meters yellow fabric, carried by a modular floating dock system of 220,000 high-density polyethylene cubes. The fabric made a walkable surface over water from Sulzano to Monte Isola and to the island of San Paolo. The event attracted 1.2 million visitors during two weeks, with 72,000 visitors per day on average and more than 100,000 visitors as peak.



ARPA Lombardia (the local Environmental Agency), in the role of the Regional Weather Service, implemented a plan aimed at supporting local authorities during the event for public safety.

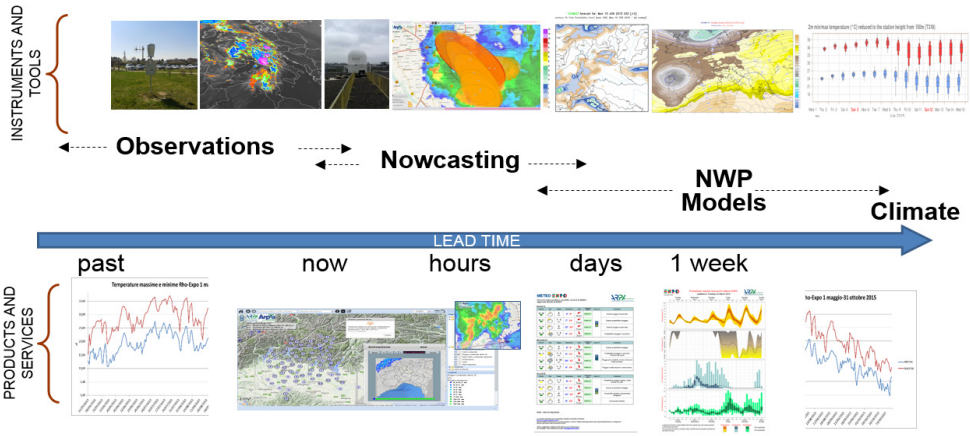
Iseo Lake Environment and climatology



Complex orography

Severe thundrstorms

Strong winds
Heat waves



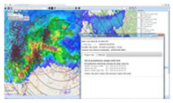
A Tailored Seamless Weather Service

Observations

- Automatic weather stations, 1 minute data sampling
- Reduced data availability lag
- X-band mobile radar:
  - site-specific scans (PPI, RHI)
  - 1 minute o 5 minute scans

Nowcasting

Identification and storm tracking

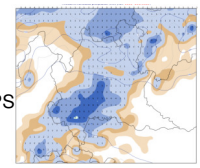


Automated early warning:

- Storm cells identification and GIS visualization;
- Storm severity classification (intensity and expected damage);
- Cell tracking and 1h displacement forecast

NWP

- ECMWF hi-res deterministic
- ECMWF EPS
- COSMO LAMs (7km and 1.8 km) and SREPS



Human Factor

All model outputs and observations interpreted by a **meteorologist** which communicates to the users

Thunderstorms, wind gusts, heat discomfort

Over the area, thunderstorms occurred in 9 days out of 16 (June 18th, 19th, 24th, 25th, 26th, 27th e 30th and July 1st, 2nd)

437 thunderstorms tracked
3 storms crossed the site. The «possibility» was forecast largely in advance thanks to NWPs and announced in nowcasting mode with a lead time long enough to allow the piers to be evacuated («red code»):

18.06, 25 minutes duration
26.06, 55 minutes duration
02.07 15 minutes duration

In the remaining cases storm passed or developed nearby: only light rain and increased wind were recorded, piers access reduced («orange code»)

Wind gusts up to **52 km/h** (Sulzano, 26.06)

13 days with heat discomfort (few degrees above the base level), 6 days up to moderate to high discomfort level («yellow code», tens of emergency admissions or on site care)

Lessons learnt

This was a case in which **the user** (i.e. the decision-maker) **wants to be informed as soon as possible**, but **he wants to take action as late as possible**. This is the reason why a mixture of medium/short range prediction models and observation/nowcasting techniques are mandatory. In this framework the reliability of NWP and their capability to forecast small scale phenomena play a key role.

References

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The Floating Piers: http://www.christojeanneclaude.net/projects/the-floating-piers

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