Developing early warning systems for Greek Prefectures and Municipalities

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Early warning systems-Why we need them?

- Severe weather events are among the great risks for modern societies.
- Climate change is increasing their severity and frequency.
- In addition, forest fires are a major environmental problem for the Mediterranean countries

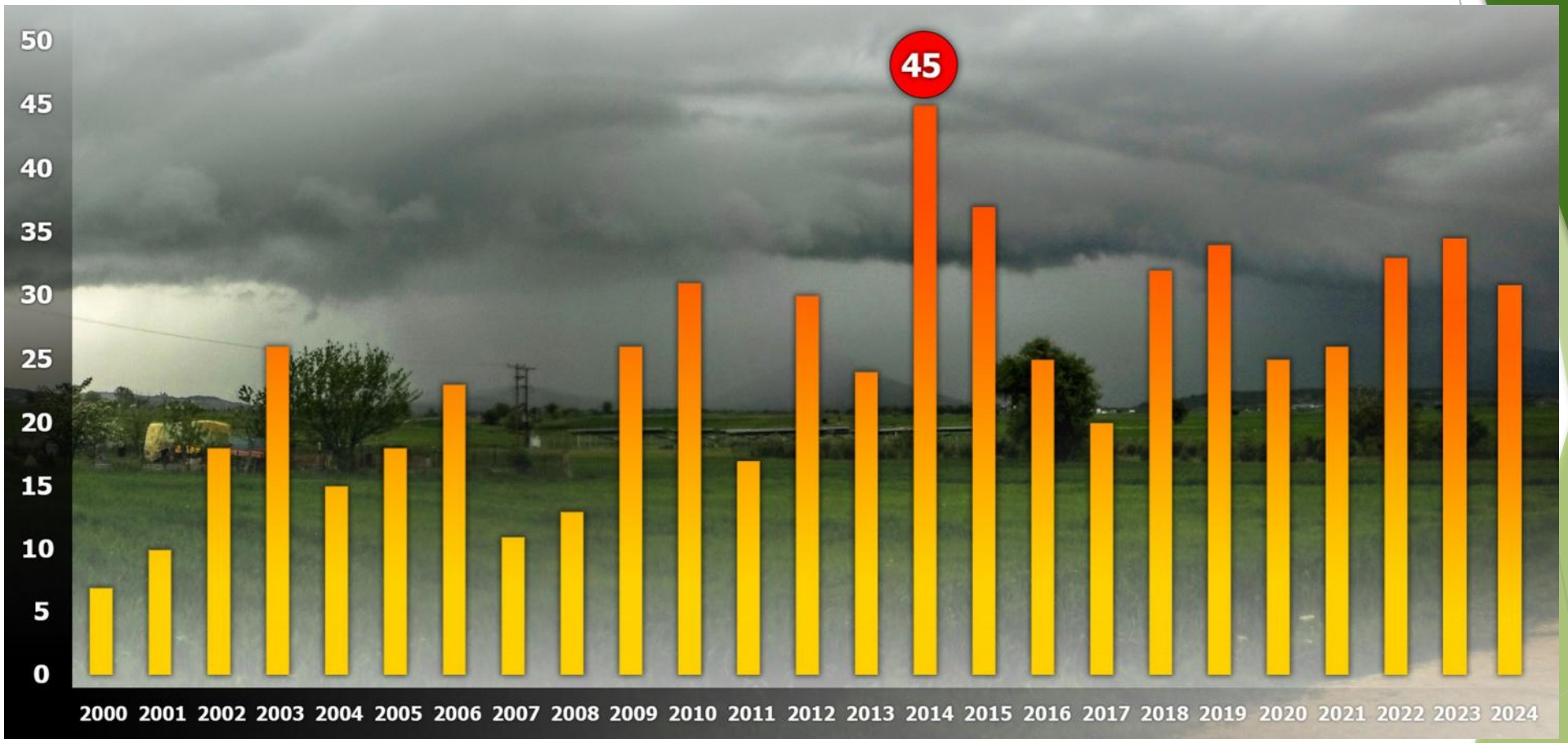
EARLY WARNINGS FOR ALL

The UN Global Early Warning Initiative for the Implementation of Climate Adaptation

WORLD METEOROLOGICAL ORGANIZATION

COP27 SHARM EL-SHEIKH EGYPT 2022

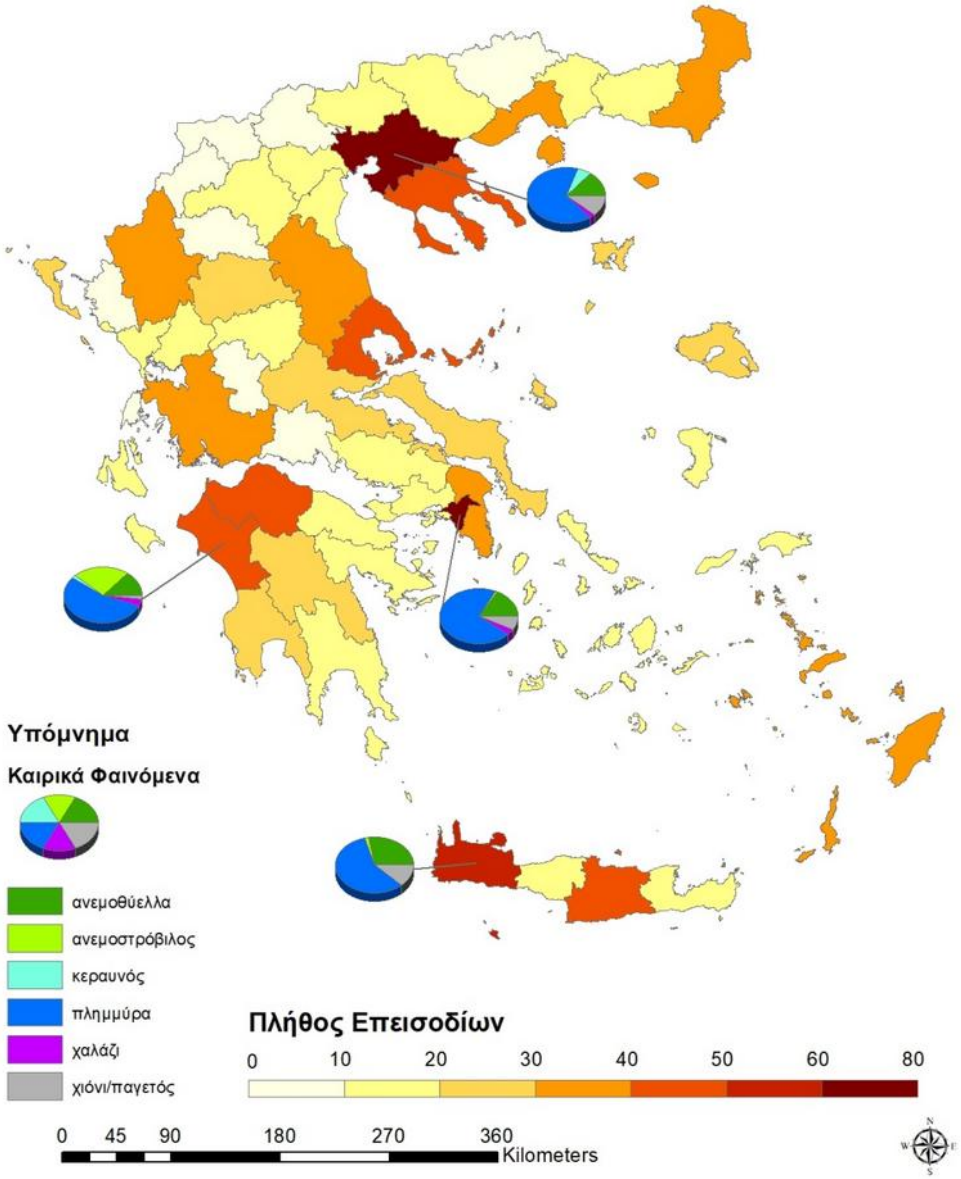
Severe weather events in Greece (2000-2024)



2000-2009: **167** weather events
2010-2019: **295** weather events

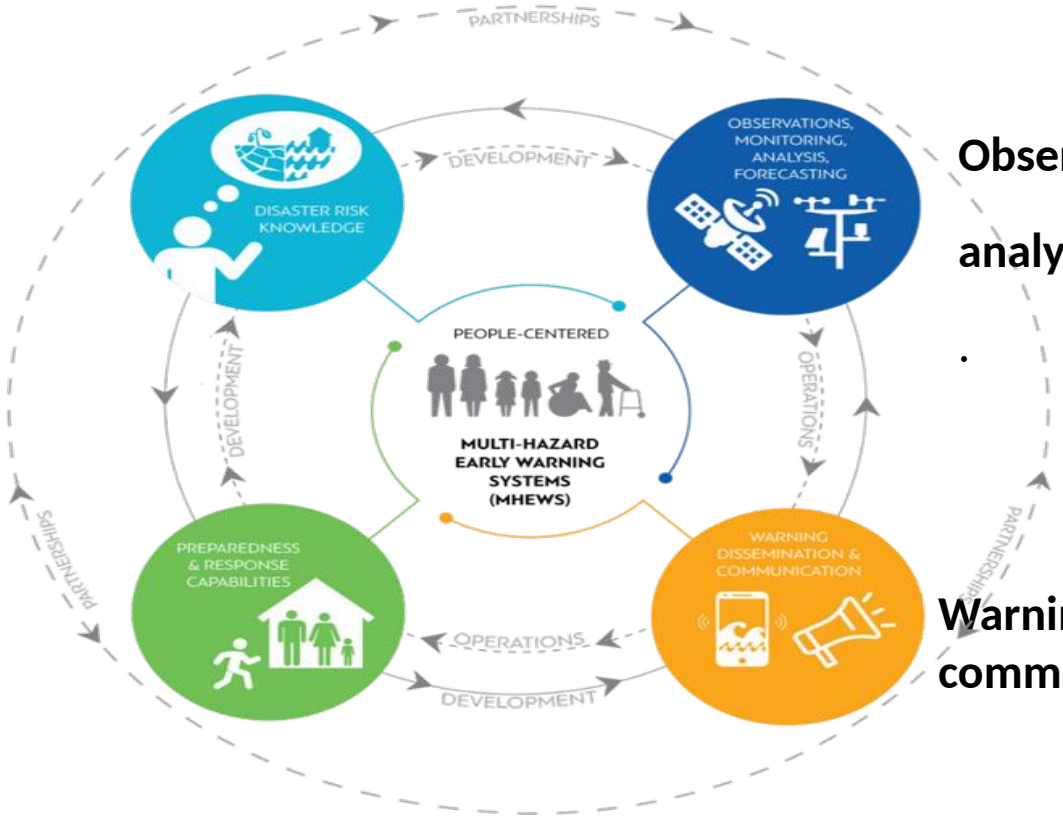
NUMBER OF THE MOST SEVERE EVENTS
2000-2009: **60** events
2010-2019: **90** events

Geographical distribution of weather events



Early warning systems-4 pillars

Disaster risk knowledge



Observations, monitoring,

analysis, forecasting

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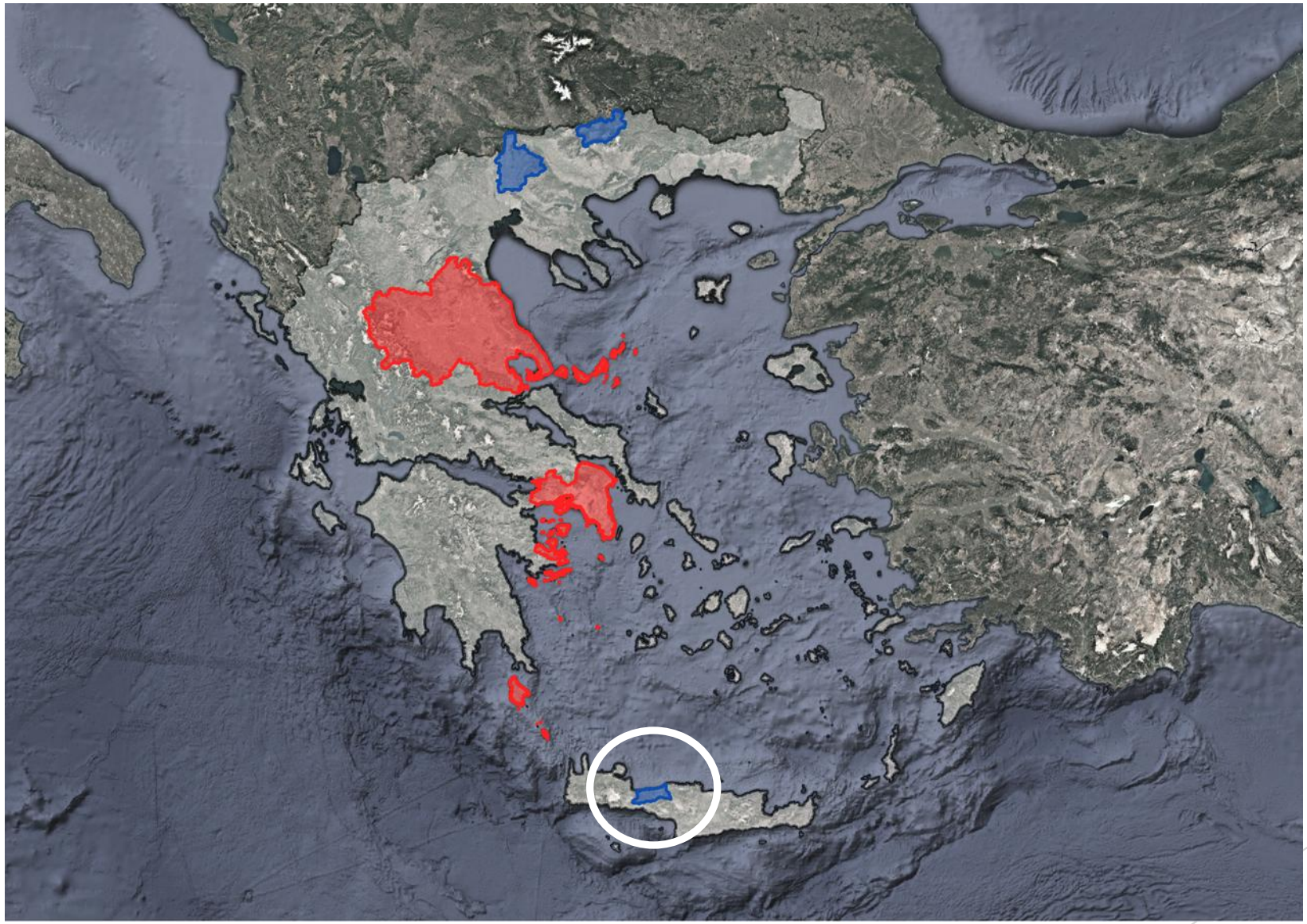
Preparedness and response capabilities

Warning dissemination and communication

Steps to build an Early Warning System

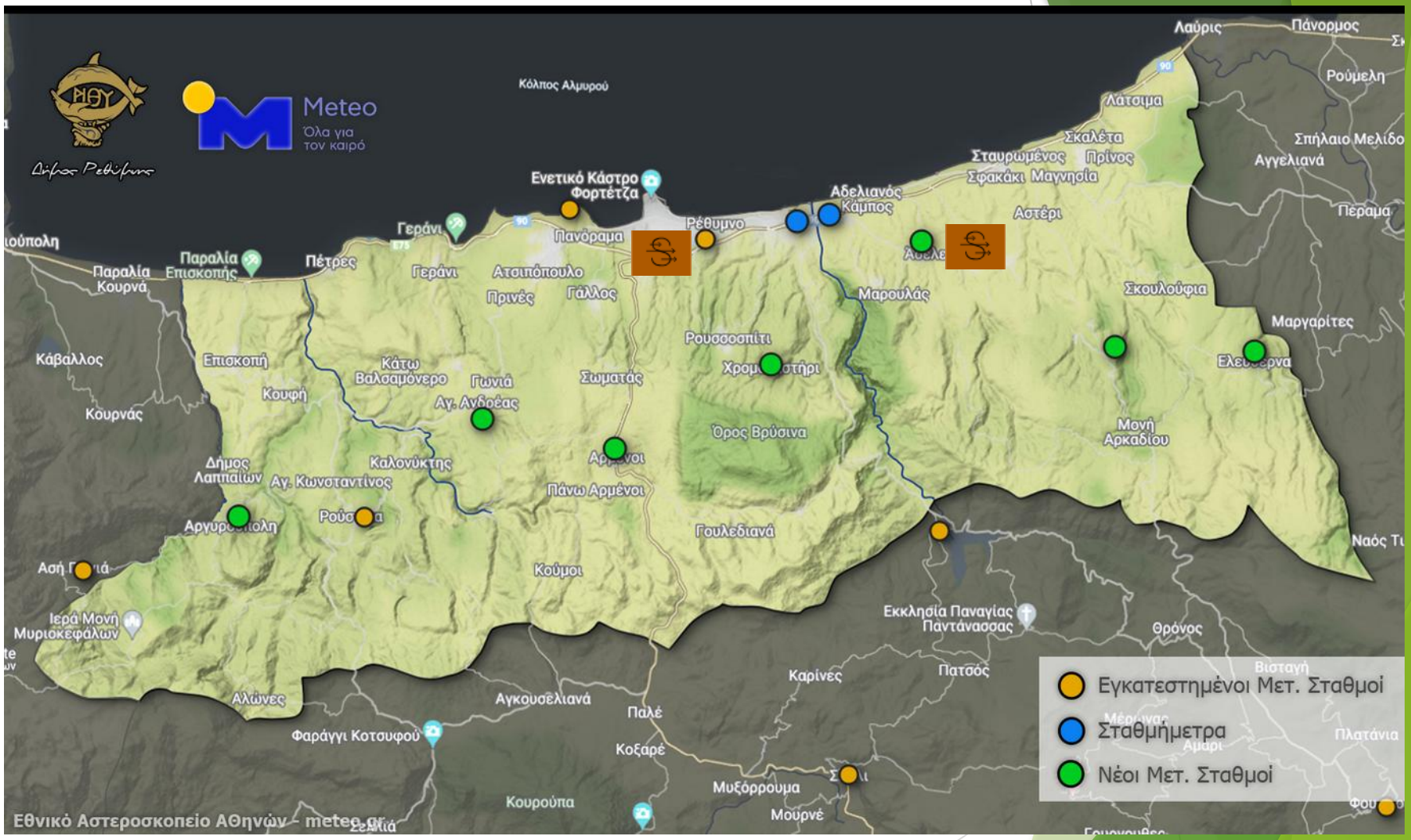
1	Identify the disaster risk factors of the area
2	Develop/expand observing platforms and forecasting services, tailored to the local needs
3	Build and operate the Early Warning System-collaboration with the local authorities
4	Training local authorities and volunteer's associations

Early warning systems in operation



Example: Building an EWS for Rethymno

- Existing weather stations (yellow dots)
- 7 new weather stations (green dots)
- 2 level meters (blue dots)
- 2 air-quality sensors



EWS-Main page

www.meteo.gr/rethymno

EWS-Main menu

Data Observations Forecasts

Source Stations Level meters Air Quality Satellite Lightning

Parameters Temp Last hour Rain Wind speed Wind gust Lowest Temp Highest Temp Today's Rain Highest Wind gust

Tables: Show

Language: English Ελληνικά

Data Observations Forecasts

Source 6km (Bolam) 2km (Hermes) Dust

Parameters Temp Rain Ac.Rain Wind speed Wind Dir SLP FWI HDW

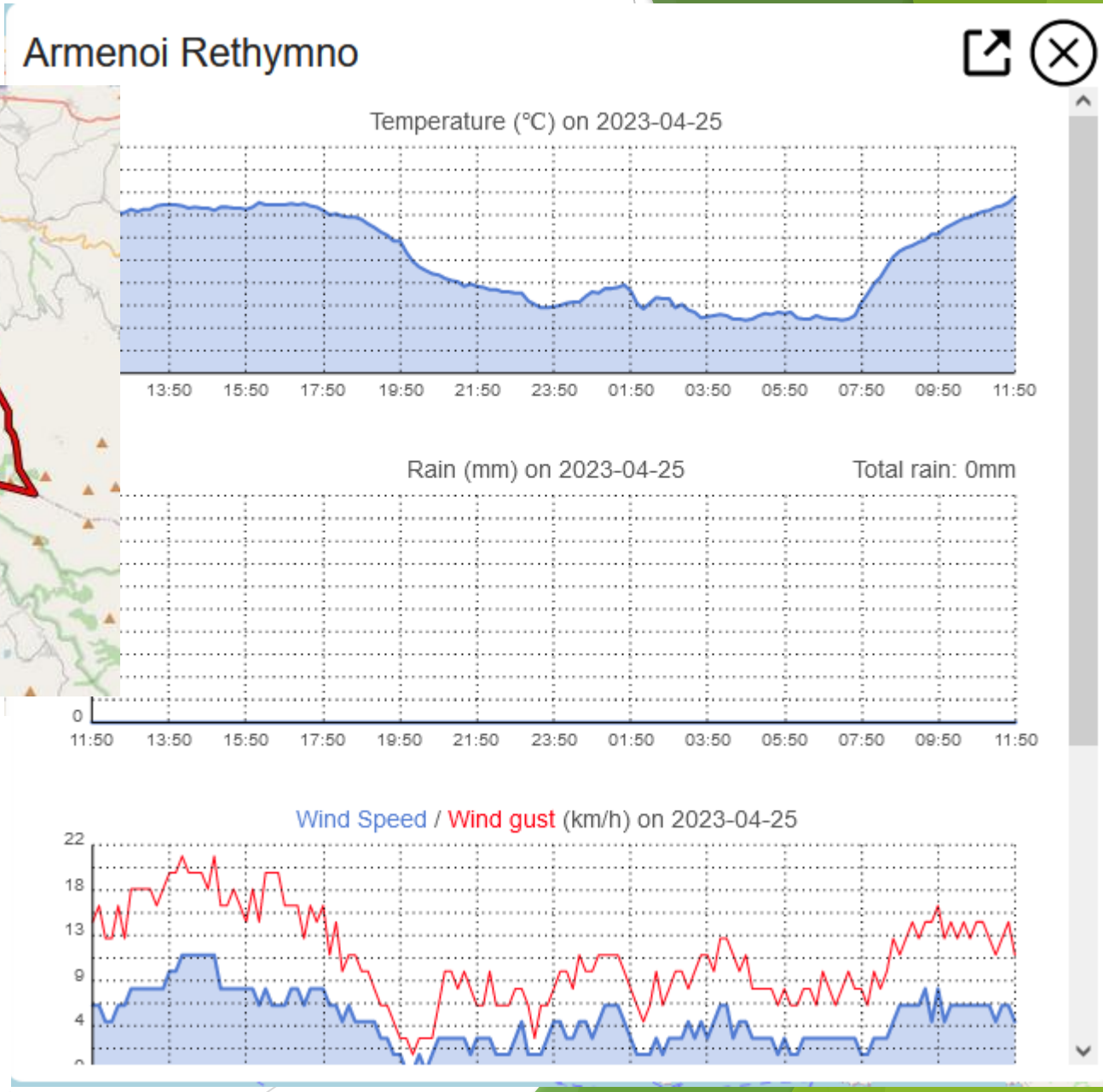
Control: Now: « ‹ › »

Scale: 2 3 4 5 6 7 8 9 10 11 **Transparency:** 40% HD

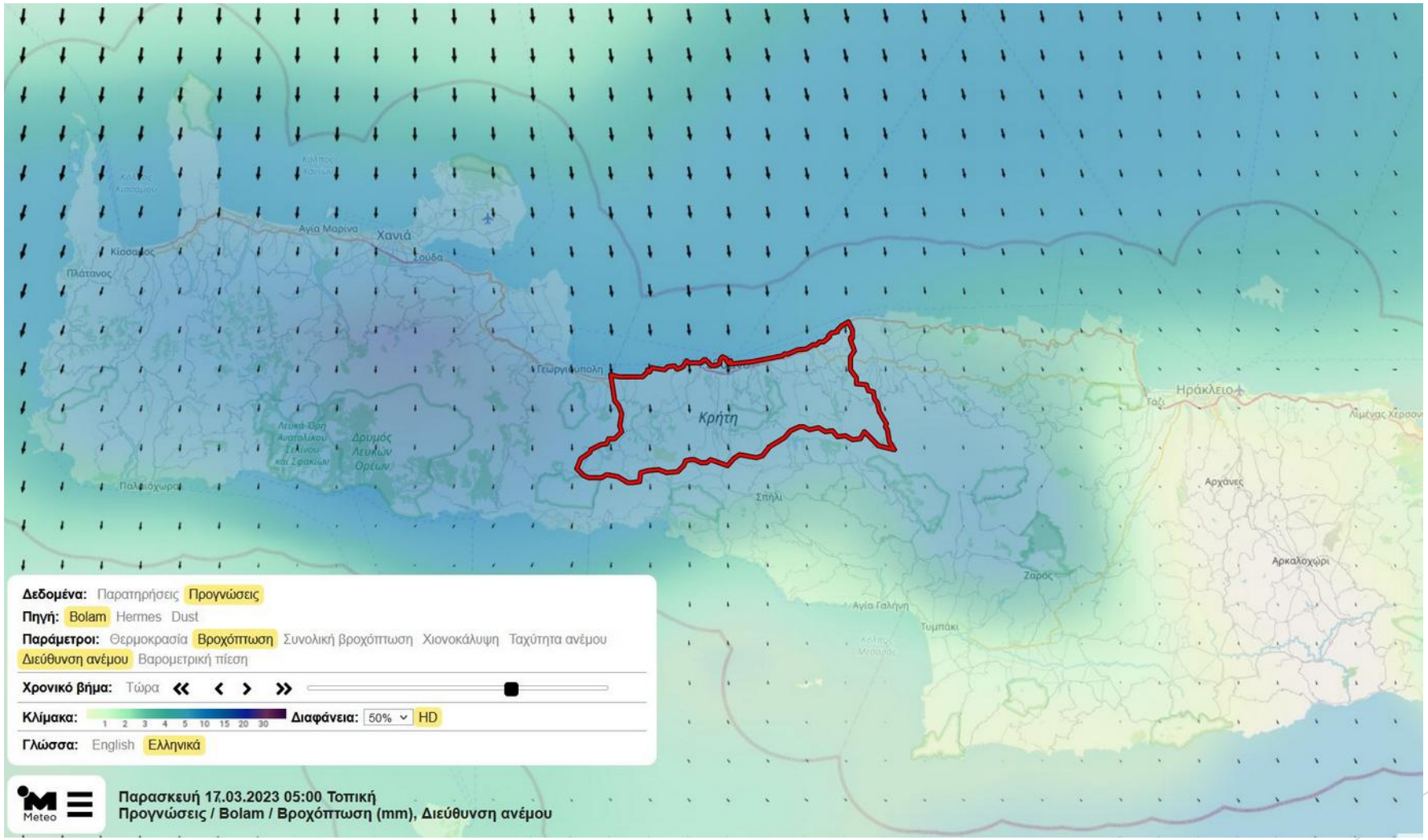
Language: English Ελληνικά

Station Observations

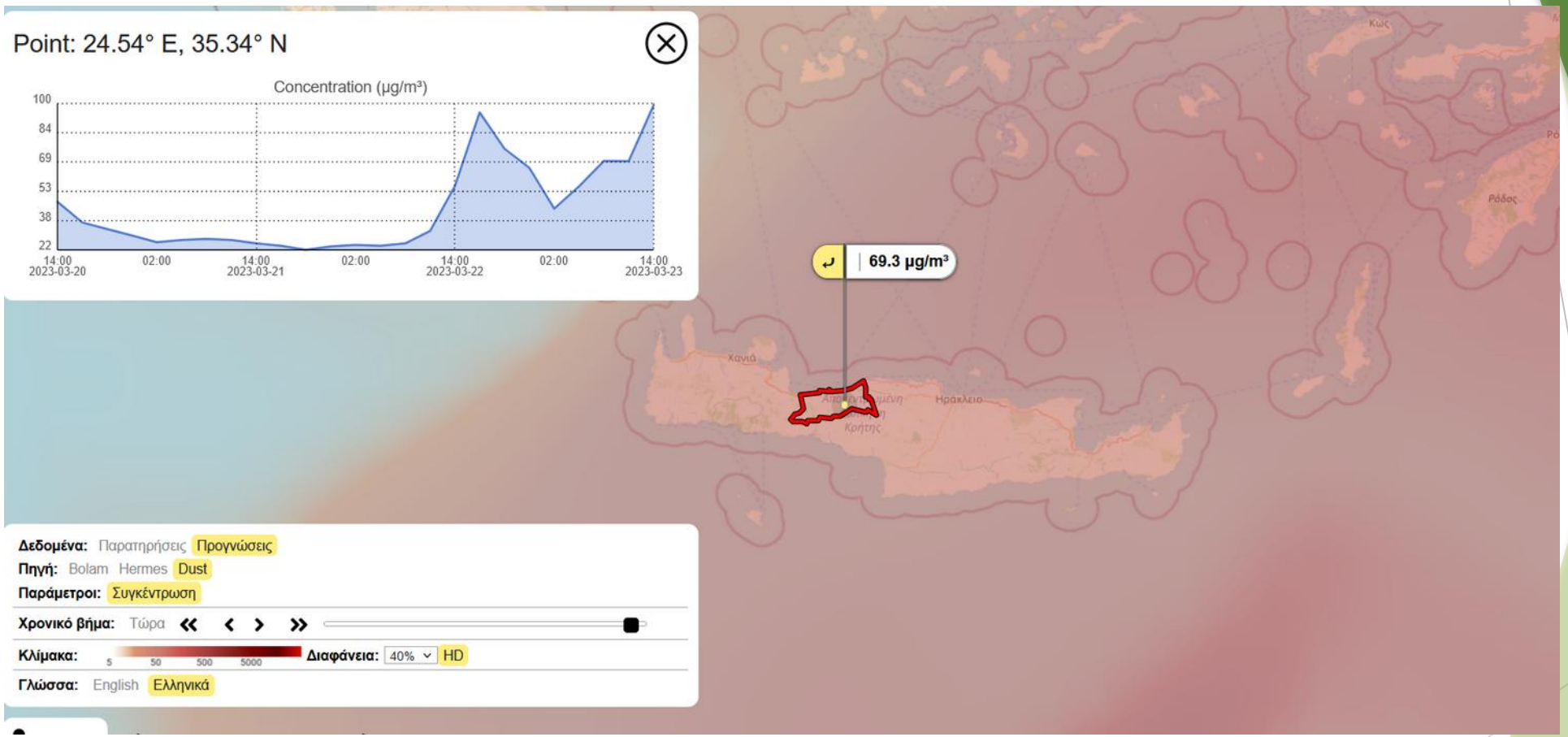
Rethymno	13.9	Rethymno - town	13.6
Adele, Rethymno	12.8	Agios Andreas Rethymno	11.4
Argyroupoli Rethymno	11.3	Roustika	10.6
Roussospiti, Rethymno	10.3	Asi Gonia	10.2
Armenoi Rethymno	9.9	Amnatos Rethymno	9.5



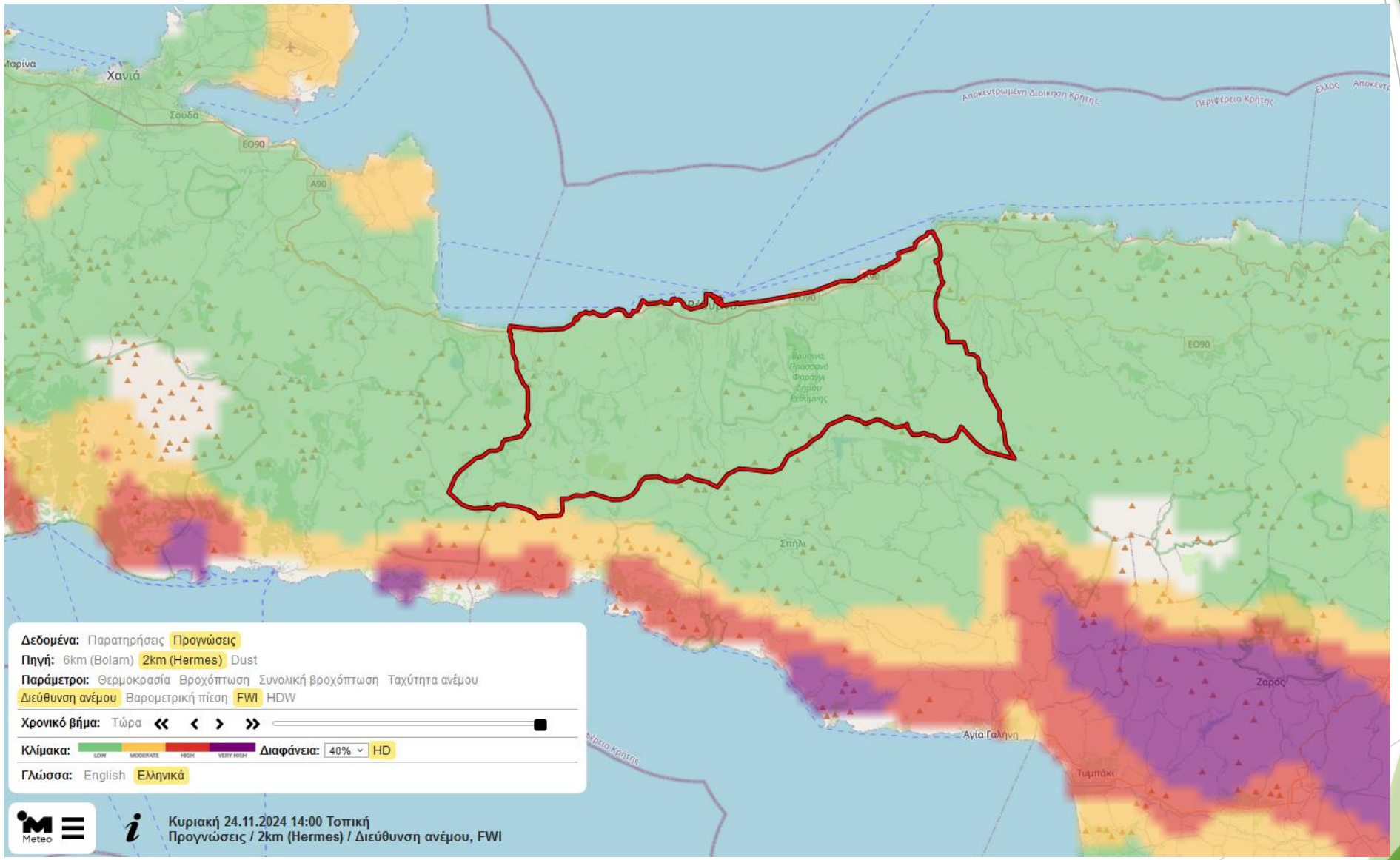
Wind and rainfall forecasts



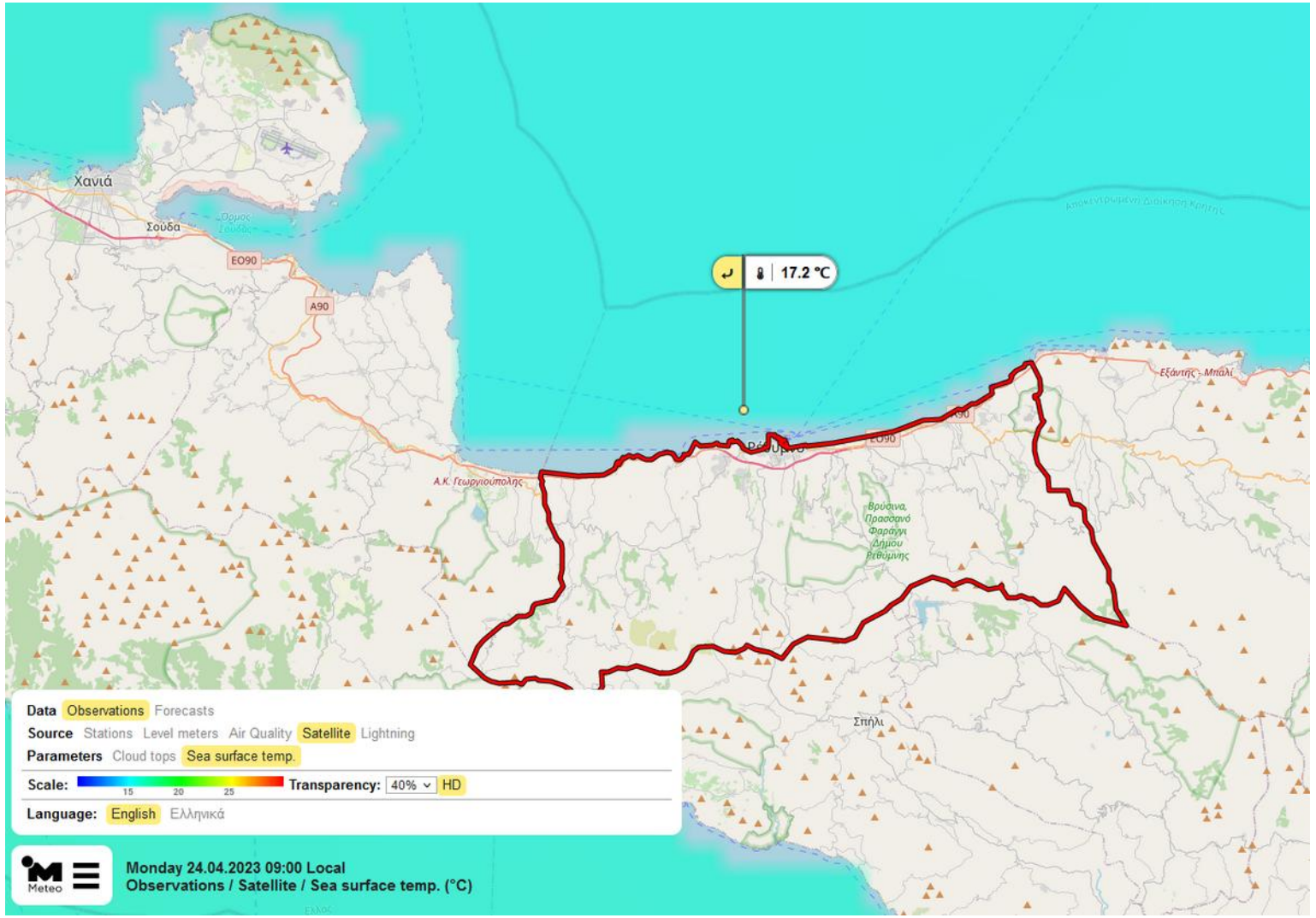
Dust forecasts



Fire danger index



Sea Surface Temperature



Automated Messaging

Wind Gusts-Crete-Southern Greece

Wind Gust Warning for Asi Gonia station on 20250311

meteomailer@noa.gr

Απεσταλμένα: Tue 11-Mar-25 09:51

Προς: vafeiadis@noa.gr; lagouvar@noa.gr; antonisbezes@gmail.com; adasoumpas@gmail.com; krevetzakis@gmail.com; votsoglou@crete.gov.gr; vmirioke@rethymno.gr; vpothitos@gmail.com; gmkapetanakis@hotmail.com; asoumpas@gmail.com; giorgosxyd@hotmail.com; anastasianestikake@gmail.com; Spathism@hotmail.com;

Wind gusts in the vicinity of Asi Gonia station has exceeded 50 km/h.
Please refer to the corresponding station webpage:
http://penteli.meteo.gr/stations/asigonia

Air quality-Northern Greece

Air Quality Warning for Volakas (PM) station on 20250316

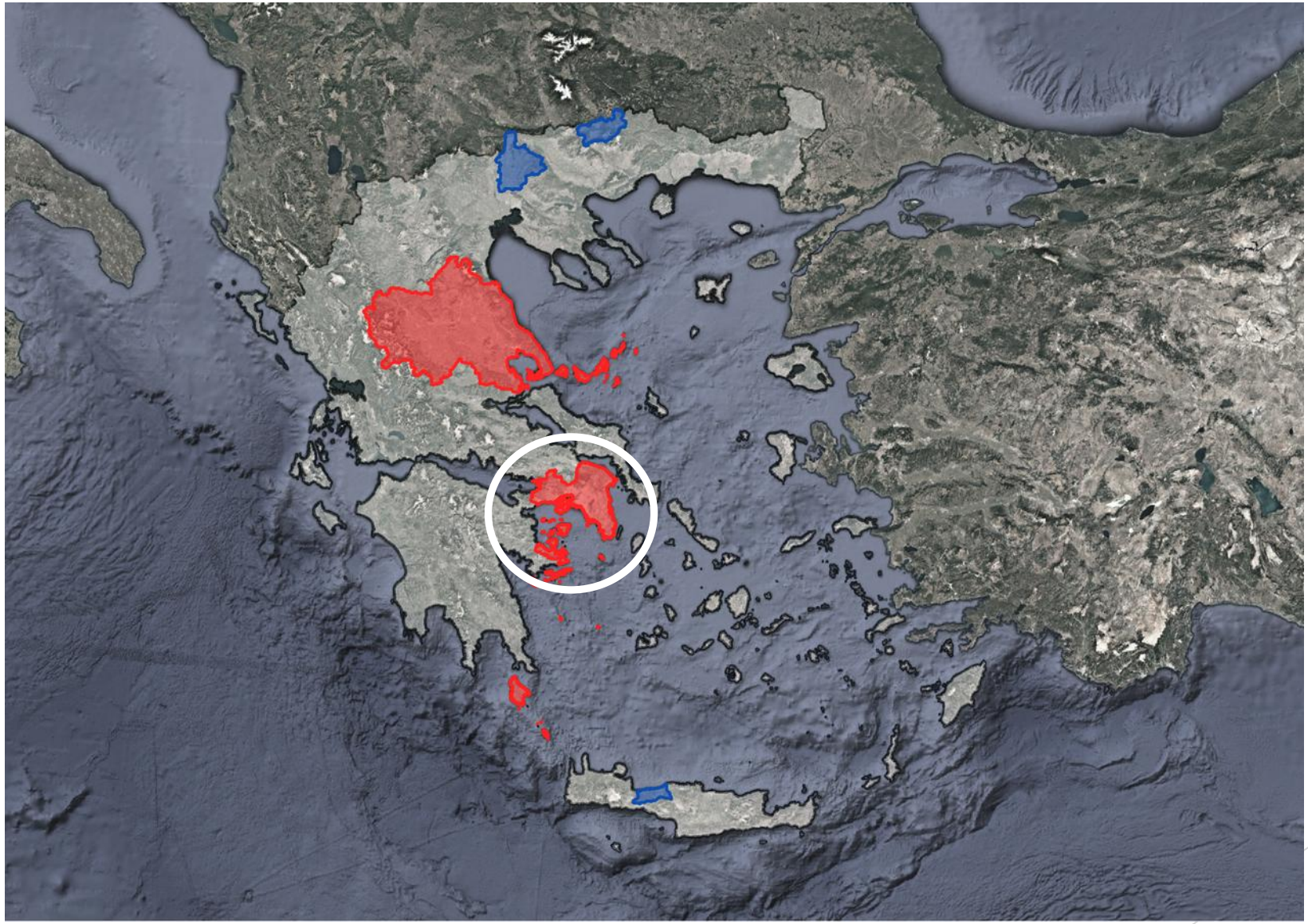
meteomailer@noa.gr

Απεσταλμένα: Sun 16-Mar-25 10:50

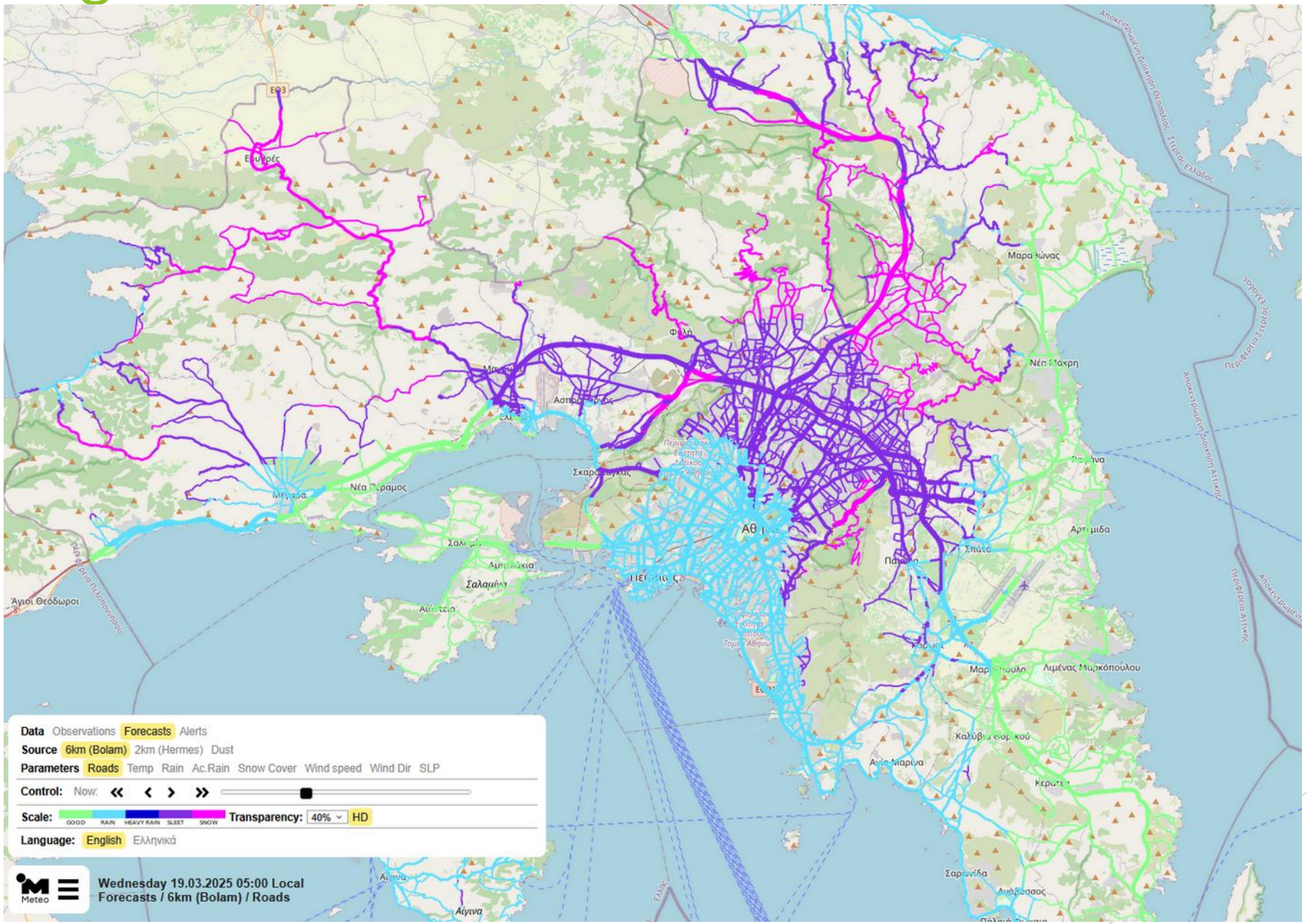
Προς: vafeiadis@noa.gr; lagouvar@noa.gr; sioumanisk@yahoo.gr

Air Quality in the vicinity of Volakas (PM) station is poor and PM values have exceeded 100 mg/m³.
Please refer to the corresponding station webpage:
http://penteli.meteo.gr/stations/dust_volakas

Early warning systems in operation



Region of Athens-Road conditions



Strengths and weaknesses

Strengths

- ✓ Unique way to combine all source of information in one platform
- ✓ Life Protection
- ✓ Infrastructure Protection
- ✓ Improved Disaster Preparedness

Weaknesses

- ✓ False Alarms & Misses
- ✓ Implementation Costs-sustainability of the infrastructure
- ✓ Authorities/Public Response Variability-Lack of integration in decision-making

Further improvements

- **Apply** an **ensemble** forecasting approach
- **Apply** hydrological models at basin scale
- Further develop **impact-based** forecasts
- Expand the **observational networks (radars needed!)**

- **Invest in staff training** with **clear operational protocols**.
- **Improve public communication** through **multi-channel warnings (SMS, social media, etc.)**.
- **Enhance coordination** between meteorological service providers, first responders, local authorities and volunteers.
- **Secure consistent funding** for system upgrades.

Meteo
All about weather

THANK YOY