FAIRMODE management practices – current status in Małopolska/Kraków

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IEP-NRI (1)
WUT (2)
IG-PAS (3)
Krakow Municipality (4)

AQ modelling for policy in Poland – new approach starting 2018

- Proposed legislation to amend several status will go to the Parliament this year (2017)

- Starting in 2018/2019 the Institute of Environmental Protection – National Research Institute will be responsible for
  - caring out air quality assessments and forecast
  - maintaining the national bottom-up emission database

Previuos modelling experience in Malopolska

- JRC campaign winter 2005 + modelling exercise (GEM-AQ) WUT + JRC)
- GEM-AQ operational forecast from December 2010 to September 2018 (evaluation every year) → WUT / IEP-NRI
- CALPUFF – air quality assessment and improvement plans → ATMOTERM S.A
- CALPUFF – forecast by IMWM in Krakow (http://smog.imgw.pl)

Activities in LIFE IP

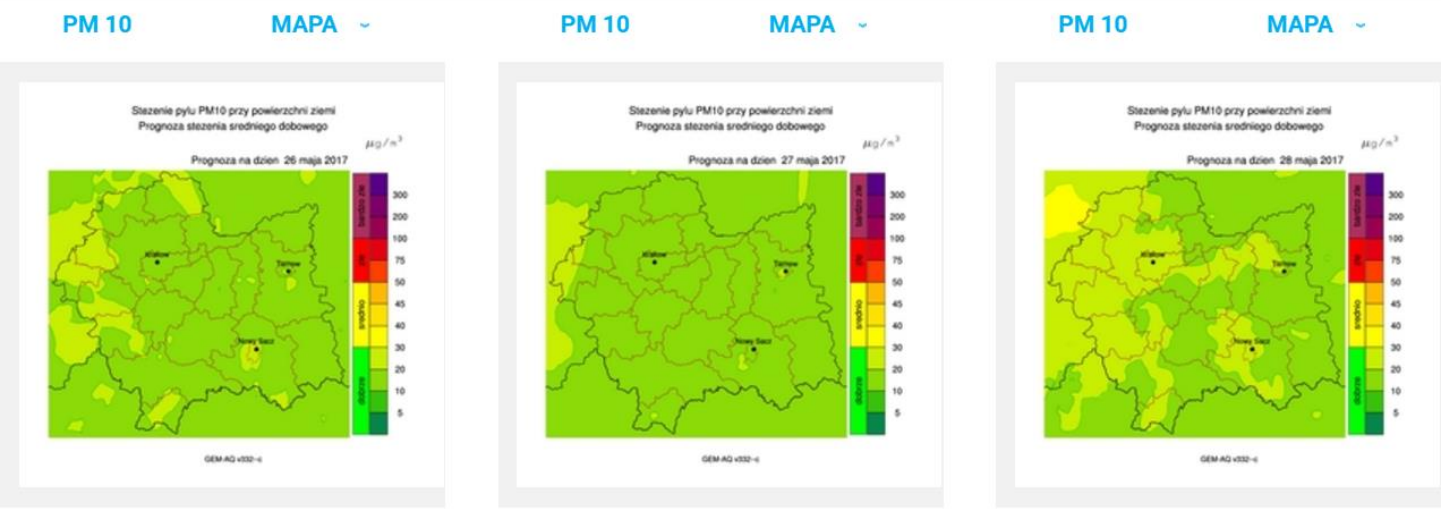
LIFE Integrated Project:

Budget: **16.8 Million Euros,** Duration: **Oct 2015 – Dec 2023**

- Emissions database and regional modelling in Małopolska, Czech Republic and Slovakia,
- Exchange of experiences with other regions in Poland, Czech Republic, Slovakia, Bulgaria and Romania.
- VITO coordinates cooperation with Czech (CHMI- CAMx) and Slovakia (SHMI) on regions of Małopolska, Silesia
- VITO will use the RIO model based on observations
- VITO will provide scenario assessment tools based on IFDM model in terms of traffic emissions in Krakow (to be used by the City of Krakow – the VISUM model is used)

Air quality forecast website

- Air quality forecast for the Malopolska Region has been operated since 2010 using the GEM-AQ model
- Air quality forecasts are the basis for the implementation of short-term actions at regional and local levels



http://powietrze.malopolska.pl/prognozy

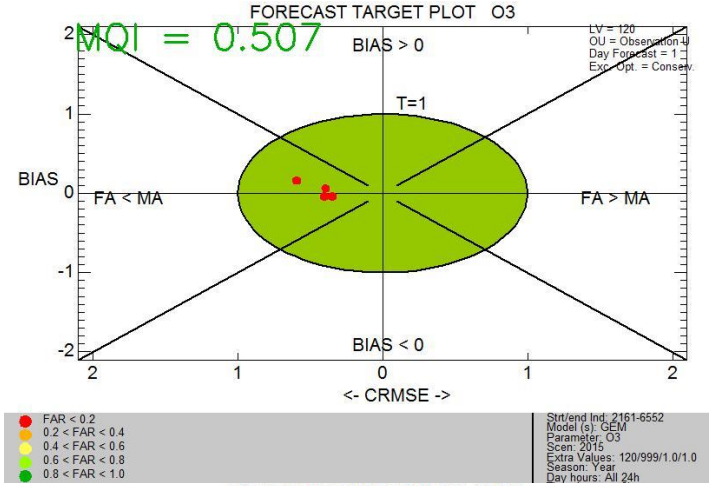
Air quality forecast website

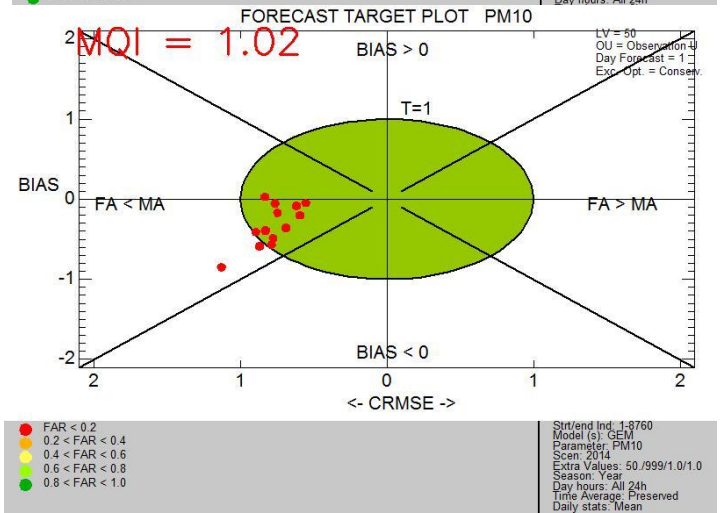
- In the winter season the website visits 6,000-8,000 users daily, in the summer 800-1,000 users daily.
- 2,700 email addresses are subscribed to the newsletter that provides warnings about risk of high air pollution.
- Website is used by regional radio stations and newspapers to inform citizens about air quality forecast.

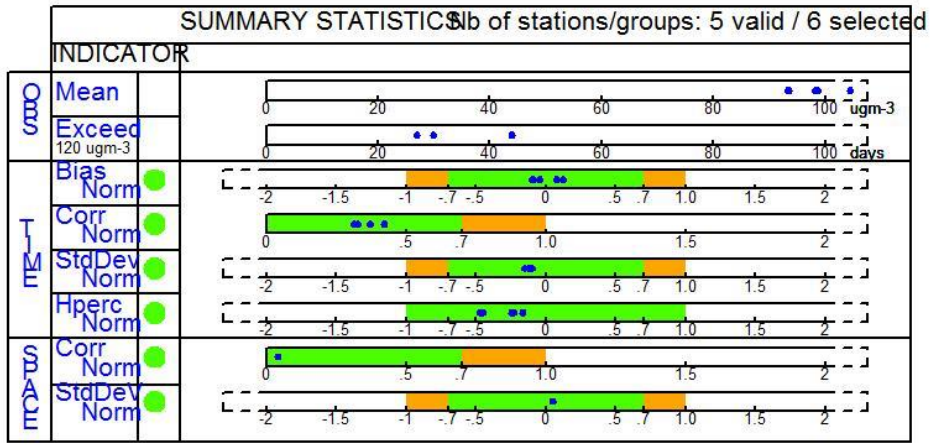
http://powietrze.malopolska.pl/prognozy

WG1 – Delta Tool

- Performance of the GEM-AQ model for Malopolska







Performance Criteria satisfied
Performance Criteria satisfied; Error dominated by corresponding Indicator
TIME: >90% of stations fulfills the Performance Criteria
SPACE: Dot fulfills the Performance Criteria
TIME: <90% of stations fulfills the Performance Criteria
SPACE: Dot does not fulfill the Performance Criteria

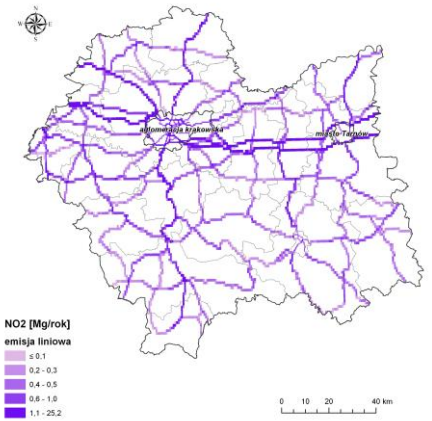
WG1

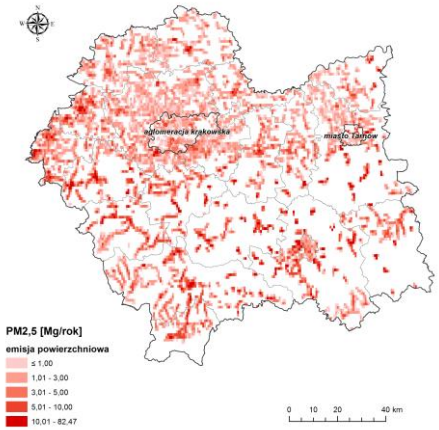
- Composite mapping - GEM-AQ results for PL delivered for 2012 and 2015 (Pawel Durka)
- Monitoring network

Lp.	Nazwa stacji	SO_2	O_3	NO_2	CO	PM_{10}	$PM_{2.5}$
1.	Kaszów		X		X		
2.	Kraków-Aleja Krasińskiego		X	X		X	X
3.	Kraków- ul. Dietla		X			X	
4.	Kraków-Kurdwanów	X	X		X	X	X
5.	Kraków-Nowa Huta	X	X	X		X	X
6.	Kraków-Osiedle Piastów					X	
7.	Kraków-ul. Złoty Róg					X	
8.	Nowy_Sącz	X	X			X	
9.	Olkusz	X				X	
10.	Skawina	X	X			X	
11.	Szarów		X		X		
12.	Szymbark	X	X		X		
13.	Tarnów-ul. Bitwy pod Studziankami	X	X		X	X	
14.	Tarnow-ul. Romana Sitko		X	X		X	
15.	Trzebinia	X	X	X	X	X	
16.	Zakopane	X	X	X	X	X	

WG2

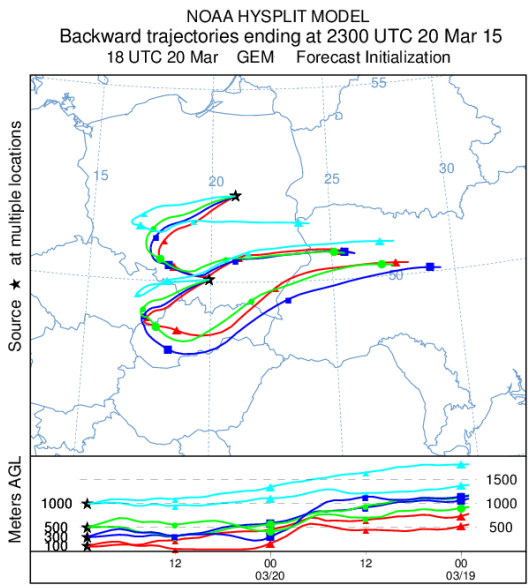
- Emission data available
  - Top-down (relocated EMEP to 5km based on GIS database) → verified
    - SNAP sectors
    - 0.05deg
    - Pollutants – NOx, SOx, CO, NMVOC, PMs
  - Bottom-up (prepared in LIFE IP)
    - Types (point/area/line sources; other)
    - Resolution: 0.1km for Krakow, 0.25km for other urban areas
    - Pollutants (NOx, SOx, CO, NMVOC, PMs + more)
    - Verification - ongoing

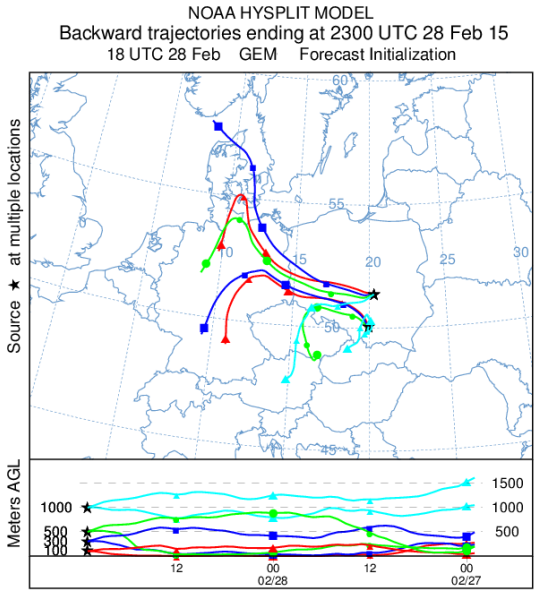


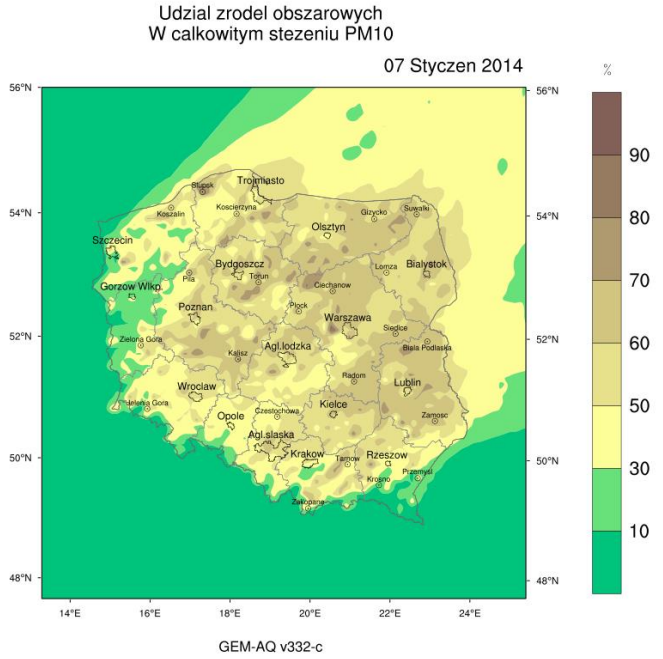


WG3

- A 4 year study on the origin of PM_{10} pollution during episodes (2013-2016) for Chief Inspectorate of Environmental Protection
- Contribution of different types of sources (GEM-AQ + bottom up national inventory)
- Trajectory analysis (based on wind field from the GEM-AQ model)
- Many episodes over southern PL

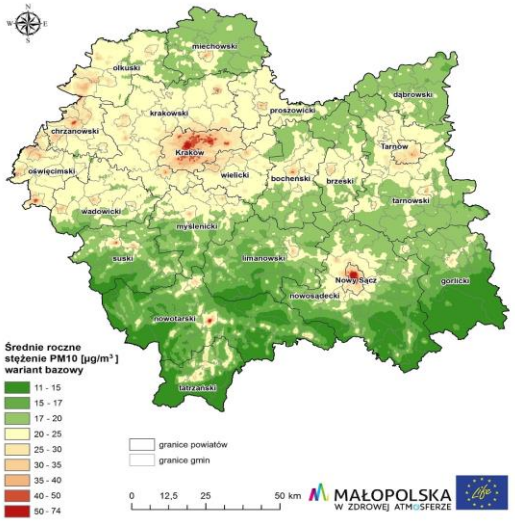


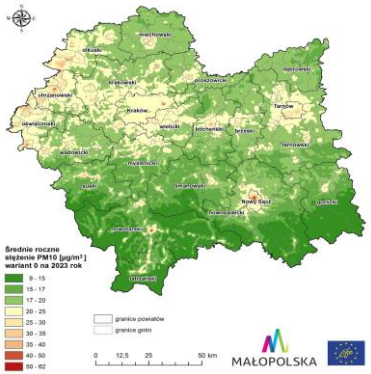


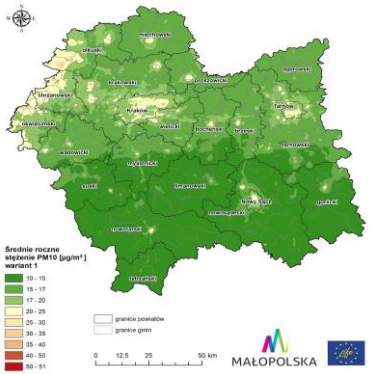


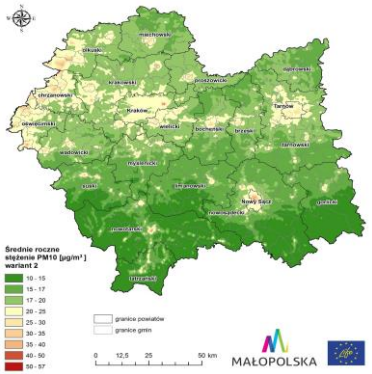
WG4

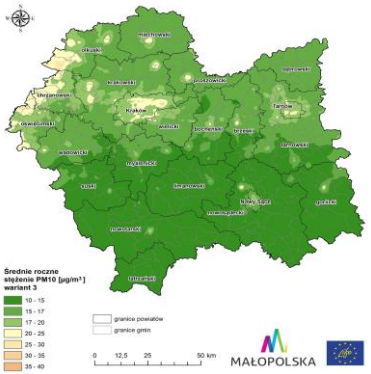
- Latest AQ Improvement Plan
  - Atmoterm S.A.
  - 5 scenarios (2023)
  - CALPUFF model

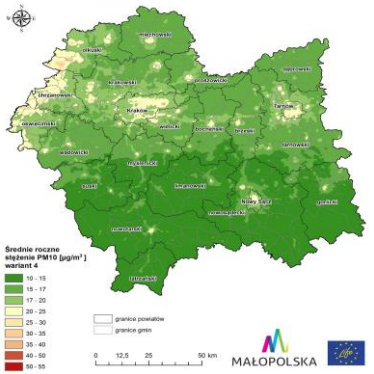












SHERPA not used so far but planned with the GEM-AQ model

Expectations from FAIRMODE pilot study

- Main objective:
  - to verify emission reduction strategies with an indication of the direction for updating/adjusting
- Specific:
  - To verify emission databases
  - To coordinate modelling activities
  - To assess contributions from different sectors using diverse methodologies and approaches
  - To assess the impact of transboundary transport
  - To increase the awareness of residents and decision-makers of the current situation and the required actions

AQ modelling in PL – current status

- Assessment
  - Responsible institution - National Inspectorate for Environmental Protection, Ministry of the Environment
  - Lowest bidder contracts (lack of continuity)
    - Ozone
      - National 15 km
      - Regional 5 km
    - Primary pollutants (including PMs)
      - National 5km x 5km,
      - Regional 1km x 1km,
      - For selected conurbations 500m x 500m.
- Forecast
  - Only ozone forecast (April-September) provided on the national level (GEM-AQ at 5km resolution)
  - Primary pollutants – direct contracts with local authorities
  - EcoForecast.pl → country scale forecast at 5km

Air Quality in Małopolska Region

- The Małopolska Region has some of the worst air quality in the EU.
  - 98% of residents live in areas where WHO standards for PM2.5 and benzo(a)pirene are exceeded.
- Population of 3.4 million – 4th largest in Poland
- Area of 15,108 km² - 12th largest in Poland
- Kraków is the regional capital
- The most popular tourist area in Poland, 14 million tourists per year (with 3 million foreigners)

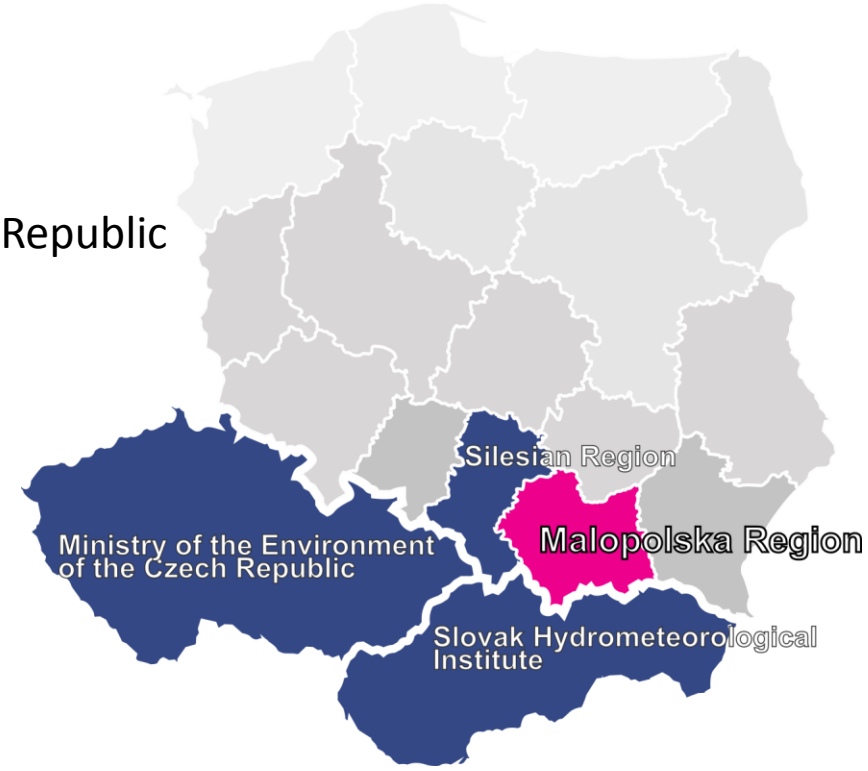
MAŁOPOLSKA
IN A HEALTHY ATMOSPHERE

Ongoing project – LIFE Integrated Project

- The main objective is to accelerate the implementation of the “Air Quality Plan for the Małopolska Region” and to improve air quality
- 62 partners of the project:
  - Małopolska Region (coordinator)
  - 55 municipalities including Kraków
  - Silesian Region
  - Krakow Smog Alert (NGO)
  - National Energy Conservation Agency
  - Ministry of the Environment of the Czech Republic
  - Slovak Hydrometeorological Institute
  - VITO NV Institute from Belgium

Budget: **16.8 Million Euros**

Duration: **Oct 2015 – Dec 2023**



MAŁOPOLSKA IN A HEALTHY ATMOSPHERE

Anti-smog regulations

- A total ban of solid fuels in Kraków was adopted on 15th of January, 2016 (effective from **1st of September 2019**).
- Ecodesign standards for emission and energy efficiency in respect to all boilers, stoves and fireplaces in the Małopolska Region were adopted on 23rd of January 2017 (effective for new devices from **1st of June 2017** and for all existing sources starting in **2023**).

MAŁOPOLSKA
IN A HEALTHY ATMOSPHERE