

The European Environment's Agency requirements for Meteorological and Climatic data

*With special focus on reanalysed
meteorological fields*

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European Environment Agency



Presentation map

- ① • What is the EEA and its missions?
- ② • Which uses require meteorological and Climatic data?
- ③ • Rationales for defining the type and aggregation of data required
- ④ • Example of uses and data requirement
- ⑤ • Conclusion

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European Environment Agency



The EEA mandate

- **The EEA** was set up as a legally independent Community body under EC Regulation 1210/90, adopted in May 1990 and revised in 1999. The Agency started working in Copenhagen in 1994.
- **Mandate:** To deliver timely, targeted, relevant and reliable information for environmental policy-making and for the assessment of environmental achievements and outcomes.
- **Purpose:** To support sustainable development and to help achieve significant and measurable improvement in Europe's environment.
- **Means:** To build indicators, assessments and data flows to organise information and produce knowledge. To this end, the EEA is the European node of EIONET (European Information and Observation NETwork)



The EEA coverage and means

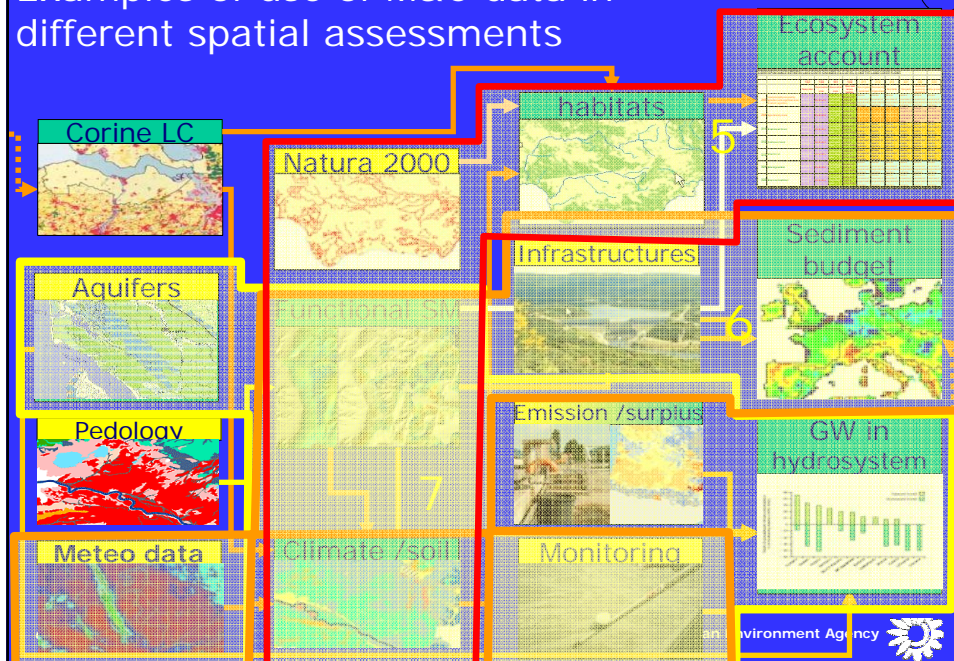
- **Coverage:**
 - 31 member countries that are:
 - The 25 EU Member States and 3 EU candidate countries — Bulgaria, Romania and Turkey
 - Iceland, Norway and Liechtenstein, which are members of the European Economic Area
 - A membership agreement has been initialled with Switzerland
 - The West Balkan states — Albania, Bosnia and Herzegovina, Croatia, the former Yugoslav Republic of Macedonia, and Serbia and Montenegro — have applied for membership of the Agency, hence making it to 37 countries potentially involved.
- **Means:** To build indicators, assessments and data flows to organise information and produce knowledge. To this end, the EEA is the European node of EIONET (European Information and Observation NETwork)



Which uses require M&C data?

- EEA action is mainly on continents
- M&C data are important variables for:
 - Assessing Primary Water resource
 - Assessing accurately water composition and quality trends
 - Assessing ecosystems status / potential
 - Assessing / forecasting air quality
 - Appreciating / forecasting CC related issues
- They are never used alone, but in conjunction with spatial data sets

Examples of use of M&C data in different spatial assessments



Rationales for assessing data requirements: defining typology

- Two different uses:
 - Building variables for assessment (“in-house” use)
 - AQ and CC modelling (outside / partners needs)
- Different types of data are required:
 - Observation (observable) data (rainfall, temperature, etc.) spatialised by modelling, etc.
 - Derived data (necessarily modelled) (effective rainfall, etc.)
- Different time horizons
 - Retrospective data
 - Forecast data and “prediction / scenario” data



Defining requirements per foreseen use

- Source data and final aggregates
 - Space resolution (source and final)
 - Time resolution (source and final)
- Requirements are specified per individual use and eventually aggregated to find out the (hopefully) unique combination of space and time resolution per variable that allows any use



Example: rainfall primary resource

- Use: water accounts (retrospective)

Rainfall primary resource	Source data required		Final aggregate (methodology is defined)	
	Variable	Space resolution	Time resolution	Space resolution
Raw rainfall (mm / R)	~1,000 km ² (to apportion to the correct catchments)	Month (to */ take into account seasonality, */ aggregate at the hydrologic year)	Accounting catchment (~10,000 km ²)	Year (civil / hydrologic)
Evapotranspiration (mm/R)	~1,000 km ² (to apportion to the correct catchments)	Month (to */ take into account seasonality, */ aggregate at the hydrologic year)	Accounting catchment (~10,000 km ²)	Year (civil / hydrologic)
Soil moisture (equivalent mm/R)	~1,000 km ² (to apportion to the correct catchments) and per aggregated LC type	Month (to */ take into account seasonality, */ aggregate at the hydrologic year)	Accounting catchment (~10,000 km ²), per LC type (rainfed agriculture)	Year (civil / hydrologic)
Effective rainfall (mm/R)	~100 to 1,000 km ² (ideal, extrapolation to small aquifers could be done from bigger size).	Month is ideal address any hydrogeological year.	Aquifer refilling area, can be estimated in the range (EU level) of several 1,000 km ² .	Hydrogeologic year (ideal from rainfall season to the next one) and civil year.

Example: Air quality modelling (tentative)

Air quality information	Source data required		Final aggregate	
	Variable	Space resolution	Time resolution	Space resolution
Raw rainfall (mm/R/F)	~10x10km grid)	Month and year averages	Not specified	Not specified
Raw rainfall (mm/R/F)	Punctual, large cities	day	Not specified	Not specified
Rainfall frequency (?/R/F)	~10x10km grid)	Month and year averages (to specify)	Not specified	Not specified
Rainfall frequency (?/R/F)	Punctual, large cities	day	Not specified	Not specified
Wind velocity (m/s/R/F), direction not specified ?	~10x10km grid)	Month and year averages (to specify)	Not specified	Not specified
Wind velocity (m/s/R/F), direction not specified ?	Punctual, large cities	day	Not specified	Not specified
Temperature (°C/R/F)	~10x10km grid)	Month and year averages (to specify)	Not specified	Not specified
Temperature (°C/R/F)	Punctual, large cities	day	Not specified	Not specified
Solar radiation (J/m ² ?/R/F)	~10x10km grid)	Month and year averages (to specify)	Not specified	Not specified
Solar radiation (J/m ² ?/R/F)	Punctual, large cities	day	Not specified	Not specified

Summary of requirements (tentative for aggregation level)

Time → Area ↓	Year and more	Month	10 days	Day	<day
50*50 km					
25*25 km	BV (stats)	BV	BV	CC	
10*10 km	AQ	BV,AQ	BV	CC	CC
local				AQ	CC

BV: building variable, AQ: Air Quality, CC Climate change



Summary of requirements (tentative for variables)

Variable	BV required	AQ required	CC required
Rainfall	X	X	X
Evapotranspiration	X		X
Soil moisture	X		X
Effective rainfall	X		
Soil temperature	X		
Snow coverage	X		
Wind (direction, intensity)		X	X
Air temperature		X	X
Solar radiation		X	
Humidity			X
Pressure			X
Sea status			X

BV: building variable, AQ: Air Quality, CC Climate change



Conclusions

- A limited set of variables is required for environmental assessment (water, ecosystems, terrestrial issues), evaluating and forecasting air quality and climate change,
- Most space aggregates requirements are on smaller grids (10*10km or less) than currently available,
- Despite commonalities, the requirements as variables items, space and time aggregates are different enough to consider that distinct production (at least delivery) processes should be envisaged,
- Further investigations are required to accurately analyse and specify requirements within EIONET and also with EEA partners such as JRC and fit to standard grids (could be done in the next 2 month for example)



Thanks for your attention...

- www.eea.eu.int

