

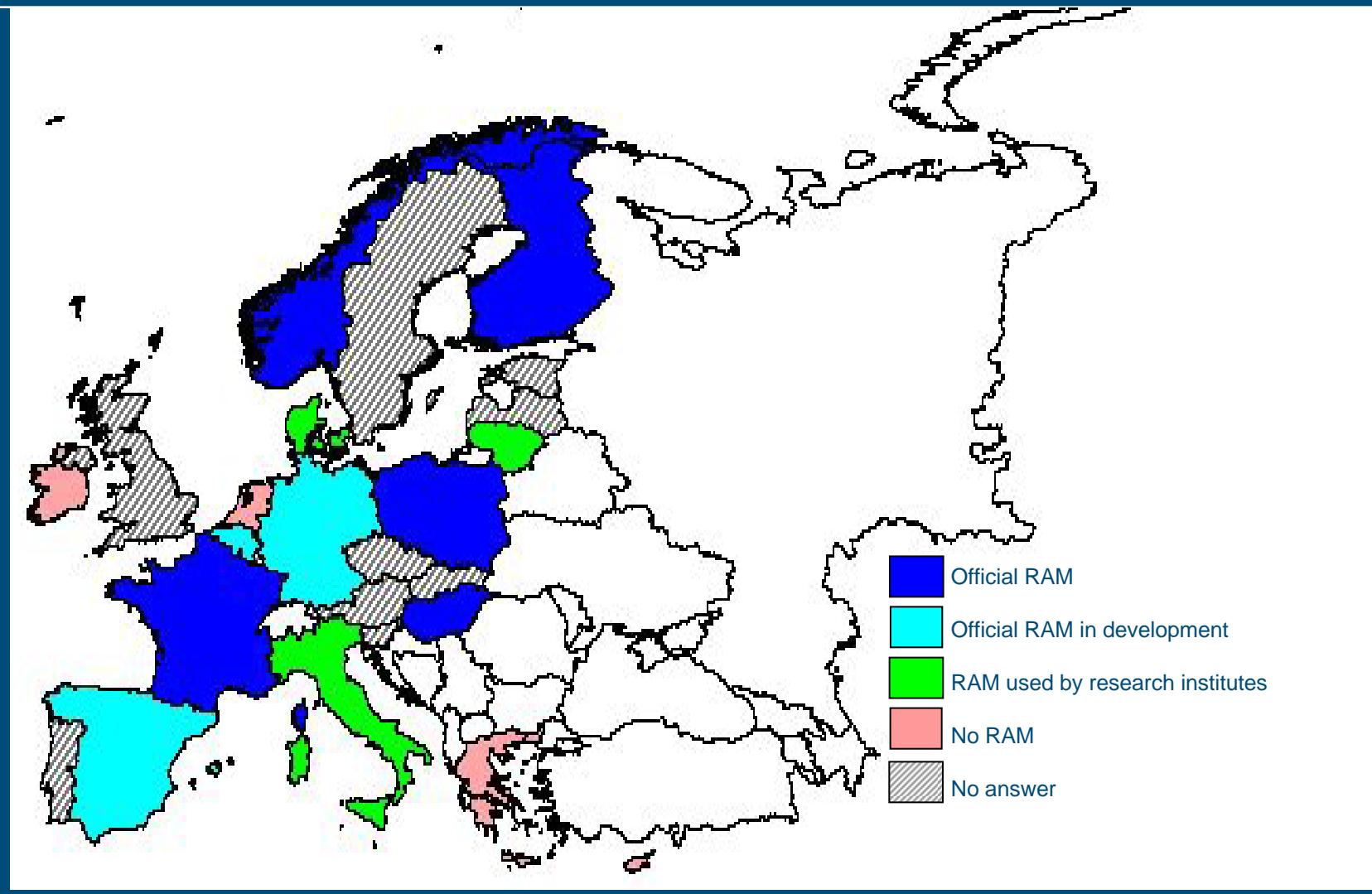
Risk Assessment Methods for soil erosion in Europe

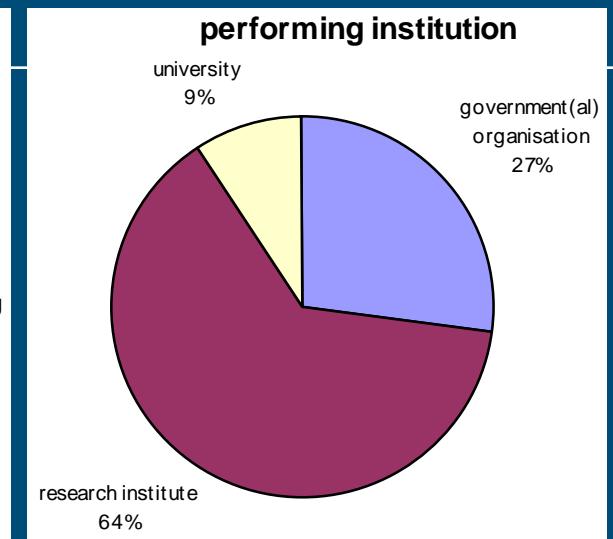
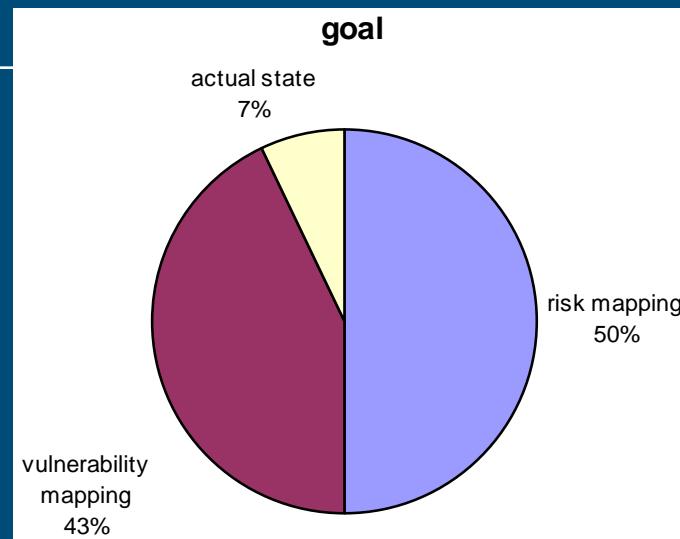
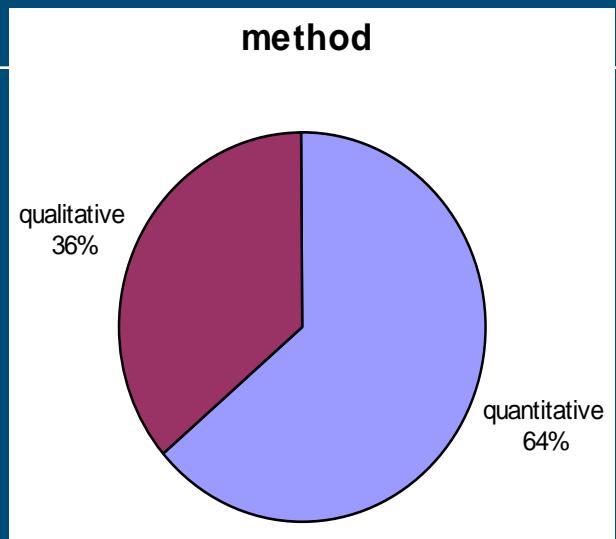
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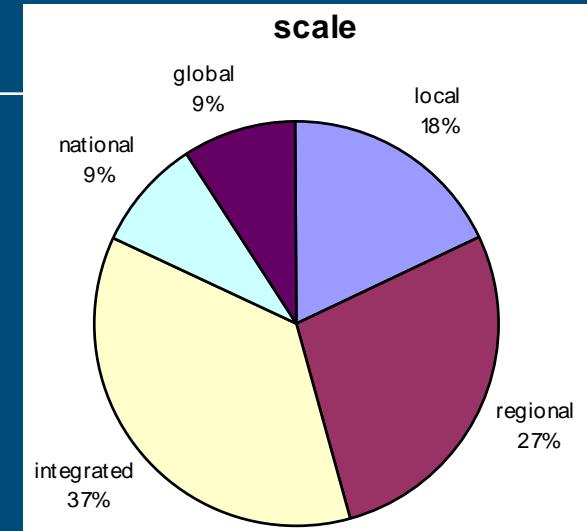
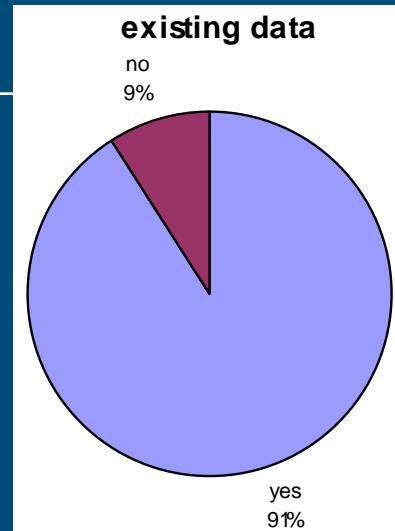
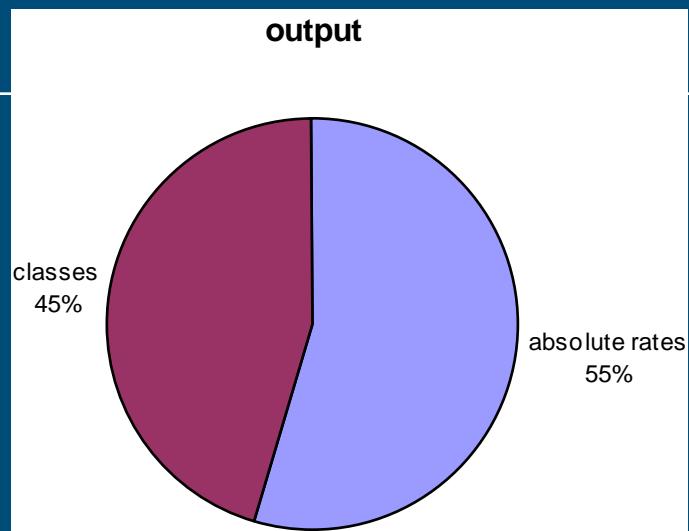


RAMs for soil erosion in Europe: facts & figures



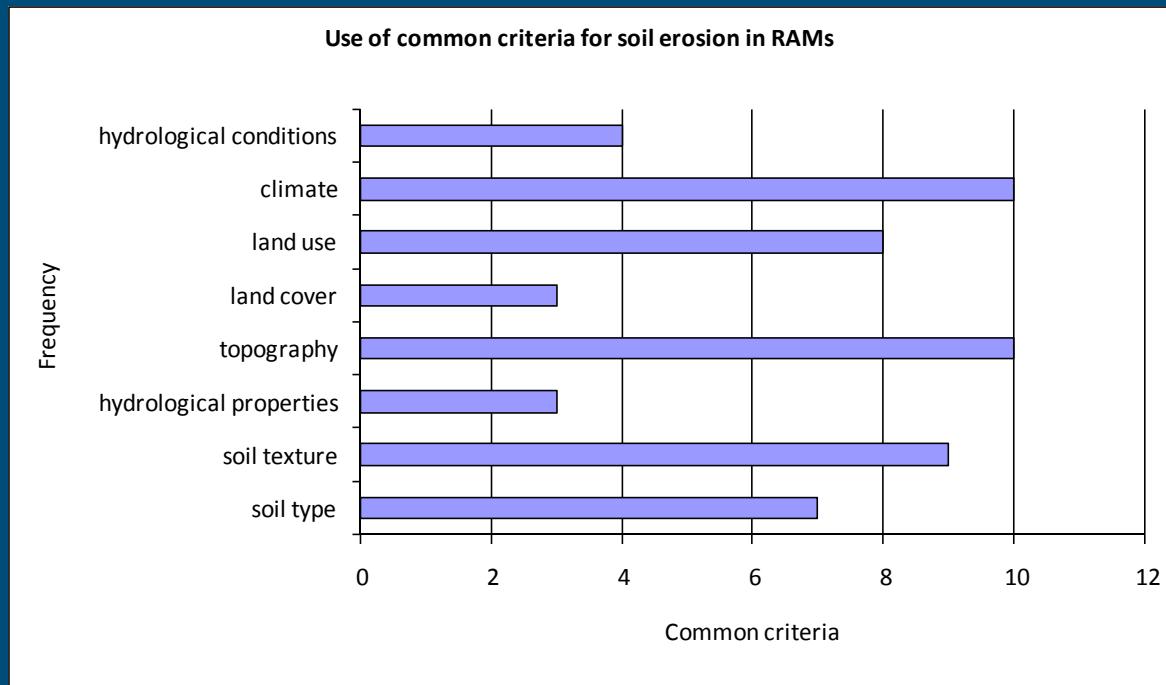


- Mostly quantitative methods used
- Risk and vulnerability mapping rather than actual state of soil erosion, but process quantification rather than risk/vulnerability
- RAMs developed and run by research institutes



- Output in terms of qualitative ratings (weak, moderate, severe erosion) and quantitative rates (t/ha/y)
- Based on existing data
- Outputs on multiple scales

Options for harmonization: data collection (stage 1)



- Wide use of existing data (common criteria) offers perspective

BUT, there are many difficulties:

Options for harmonization: data collection (stage 1)

- Harmonization must distinguish between response and input data and take account of varying methods for acquisition and processing
- Must deal with varying scales of existing data (e.g. 1:50.000-1:250.000 (Spain) versus 1.000.000-1:5.000.000 (France))
- Must take account of spatial and temporal support of measurements and existing input data (e.g. event-based versus annual)
- Must take account of differences in accuracy and classification systems used (e.g. for soil types, soil texture)



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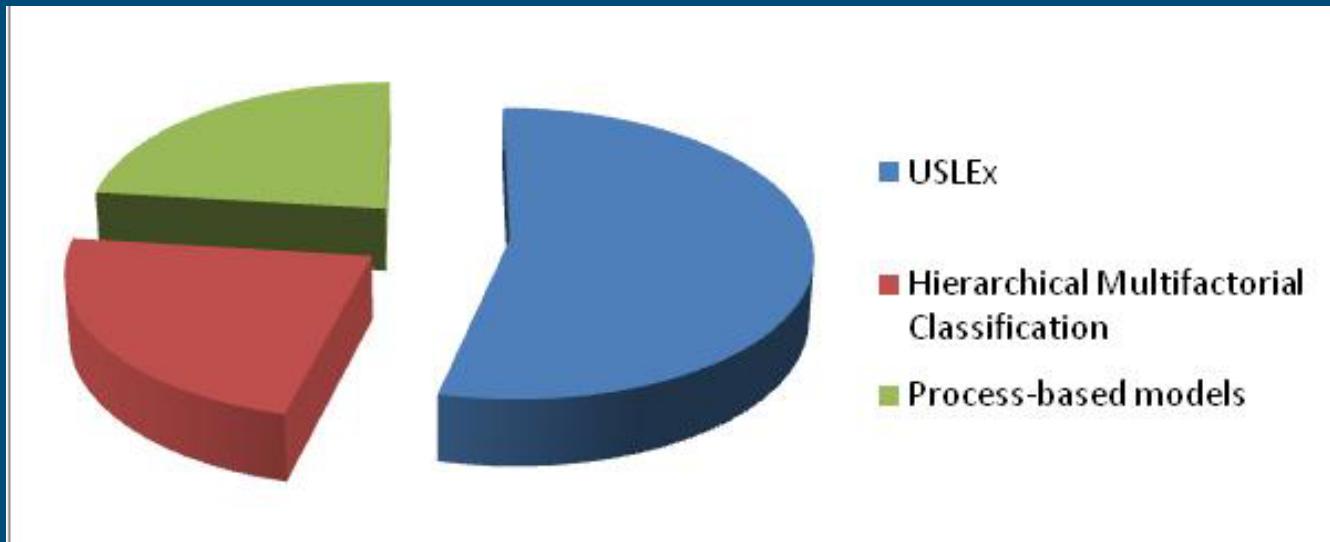


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Options for harmonization: data collection (stage 1)

- Monitoring is essential given the difficulties in describing soil erosion, but only practice for 5/11 RAMs
- Harmonization of target variable for direct measurement/field observation required (e.g. soil loss, soil erosion, sediment yield)
- Data collection is regarded to be the responsibility of the individual countries

Options for harmonization: Data processing (stage 2)



- Different types of erosion (water-x, wind, translocation, shallow landslides) require different RAMs
- Calibration: 1/11, validation 2/11 >> unknown quality of model output

5.4 The Spanish dataset

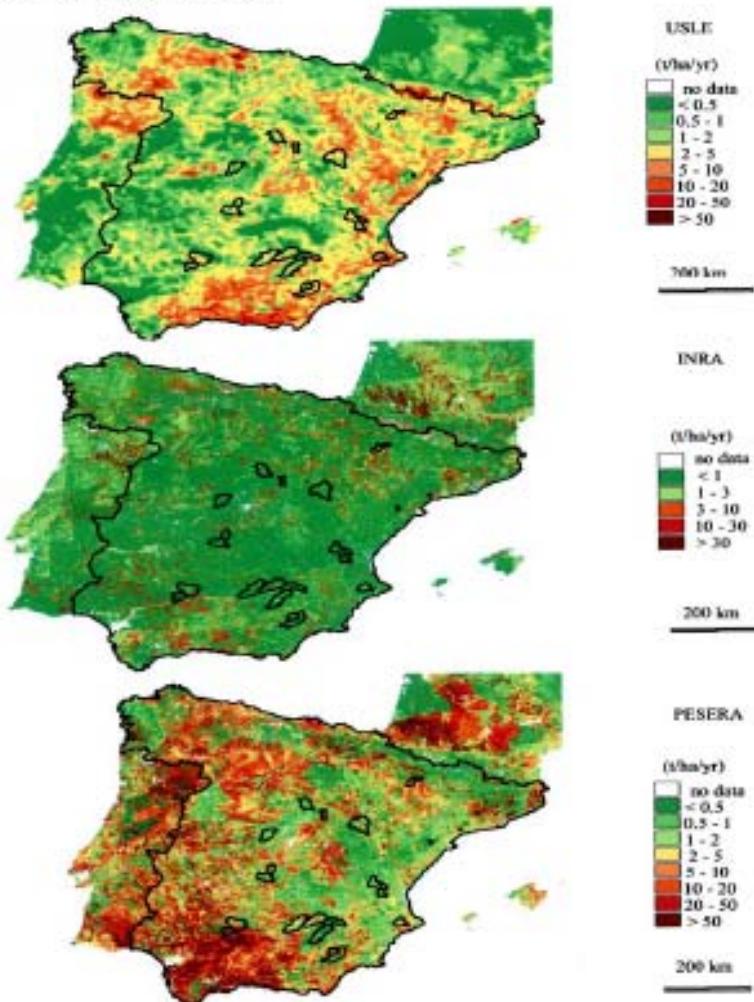
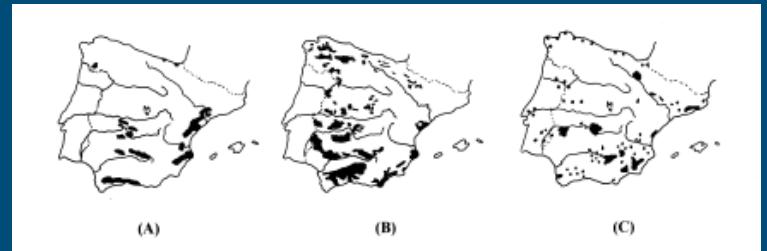


Figure 13: Soil erosion estimates for Spain and location of the validation basins.

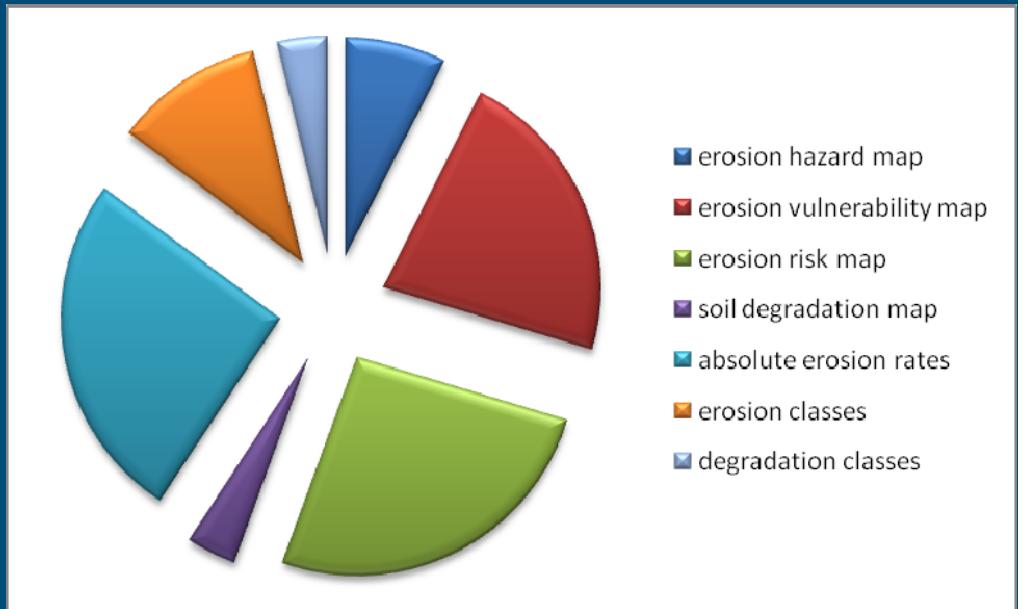
Results differ
between RAMs



Sources: ESBN research report 13, in: Recatalá-Boix et al., 2007; Sanchez et al., 2001

Options for harmonization: Data processing (stage 2)

- Harmonization of target variable required
- Information on translation of process quantification (erosion rates in t/ha/y) into 'risk' required
- Must allow for varying coverage and scales of output maps (1:5000 – 1:300.000)
- **Outputs may be harmonized (ranked classes, erosion rates), but results obtained by different model applications (of even the same model) are not comparable**



Options for harmonization: Data processing (stage 2)

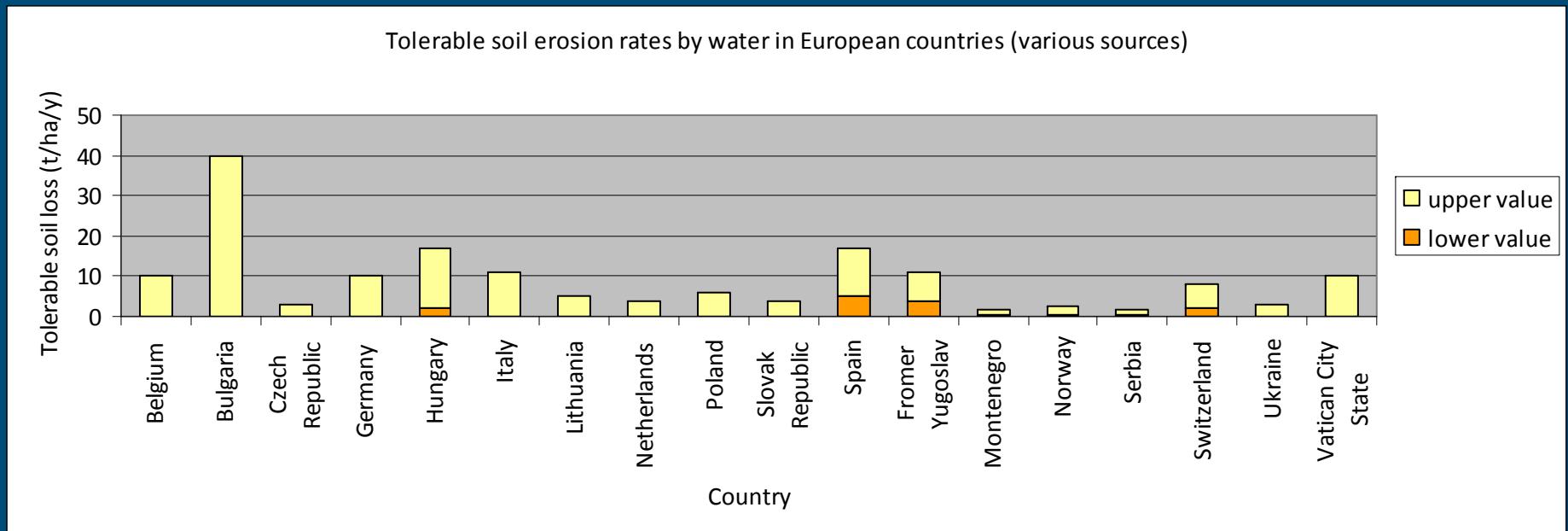
- Incorporation of conservation technologies & approaches in RAMs would be useful to track progress in soil conservation
- Current RAMs focus on on-site phenomena of soil erosion, whereas off-site phenomena cause higher RISKS to society >> Need to measure-model-map off-site phenomena



Source:Jetten, 2007

Options for harmonization: Data interpretation (stage 3)

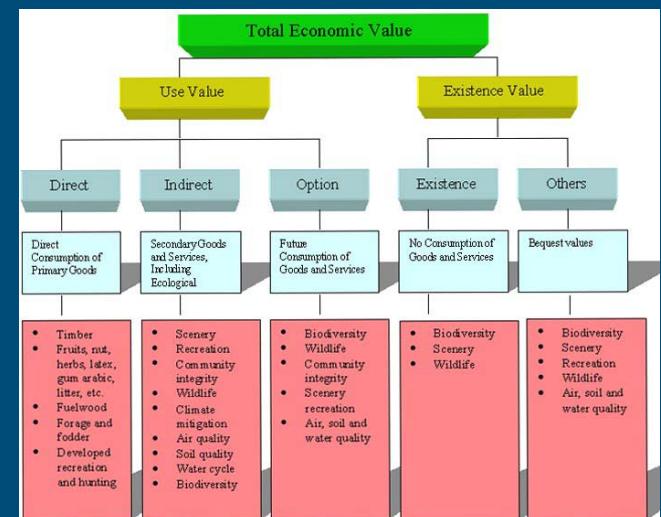
- Tolerance level used as threshold: differ between and within countries



Sources: OECD, 2008; Boardman & Poesen, 2006; RAMSOIL questionnaires

Options for harmonization: Data interpretation (stage 3)

- Origin of thresholds difficult to trace; probably related to distributions of property rights
- Refer to on-compound soil erosion hazard, but risks are largest for off-compound hazard
- Maintenance of thresholds requires monitoring



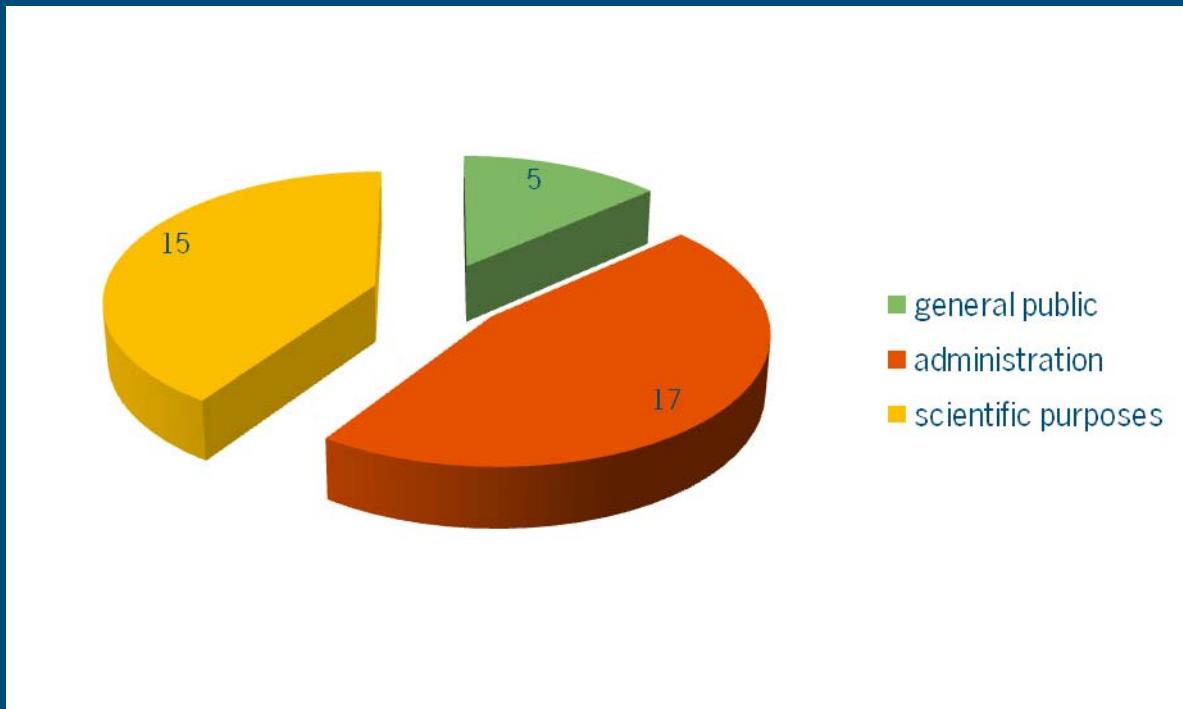
Risk perception (stage 4): connecting a 'sense of urgency' to risk levels

- For 11/21 RAMs information is used for land use planning, management or conservation strategies or for fine tuning policy regulations
- 8/21 RAMs are directly linked to community police (e.g. cross compliance, basis for legal normative)
- No information on stakeholder involvement in development and application of RAMs



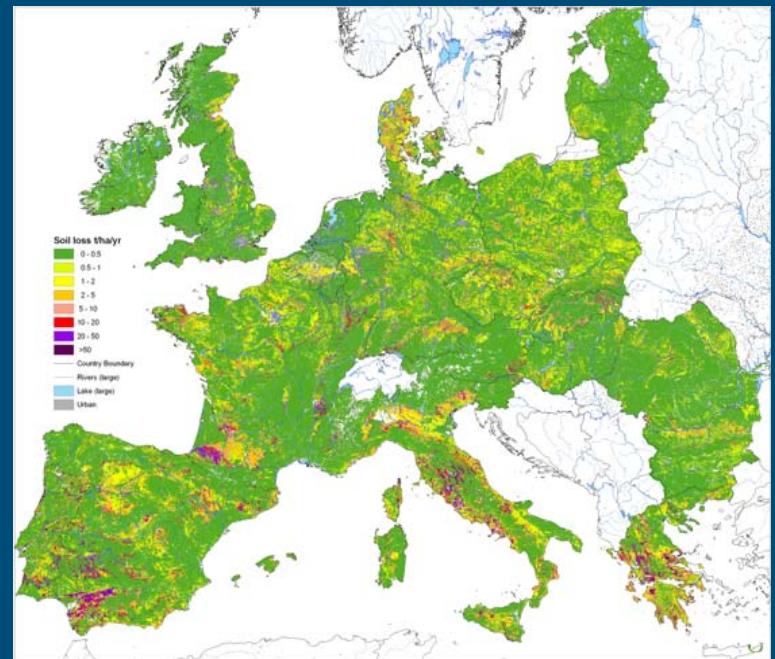
Various sources

Risk perception: sharing information on RAMs with the general public is limited – this would help to create awareness and to get policy consequences accepted



Conclusions & recommendations (1)

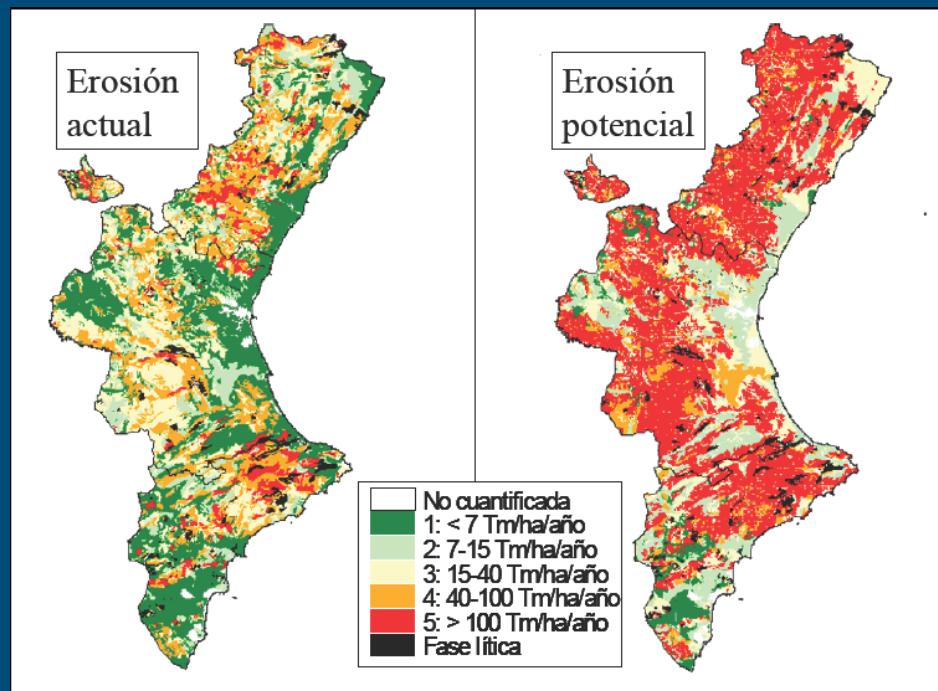
- Harmonization of the concept 'erosion risk' is necessary: hazard or likelihood x consequences?
- When only relative indication of erosion rates and identification of areas at risk is needed, *harmonization of results* is possible, without obliging the individual countries to use similar methods.
- Uncertainties related to comparability of erosion risks remain high due to the use of different methods or different applications of the same methods; only uniform application of similar methods would allow comparison, based on similar data collection.
- The PESERA model (Kirkby et al., 2004) is currently the most suitable method for European wide risk assessment, provided that good quality data are available.



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Conclusions & recommendations (2)

- Important effort for harmonization is required in data collection and processing. Currently, data collection is regarded to be the responsibility of the individual countries.
- Harmonization should allow for downscaling to regional and local scales, and distinguish between on- and off-site impacts in data interpretation and risk perception.



Source: Recatalá-Boix et al., 2007

Thank you for your attention

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