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The LIFE MED HISS Project

Ennio Cadum

On behalf of MED HISS working group

LIFE MED HISS Collaborative Group:

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ISGlobal Institut de Salut Global Barcelona

CREAL centre de recerca en epidemiologia ambiental

NIJZ Nacionalni inštitut za javno zdravje

Instituts thématiques Inserm Institut national de la santé et de la recherche médicale

UPMC Sorbonne Universités

ENEA Italian National Agency for New Technologies, Energy and Sustainable Economic Development

A.S.L. TO3 Azienda Sanitaria Locale di Collegno e Pinerolo

Arpa Piemonte Agenzia Regionale per la Protezione Ambientale

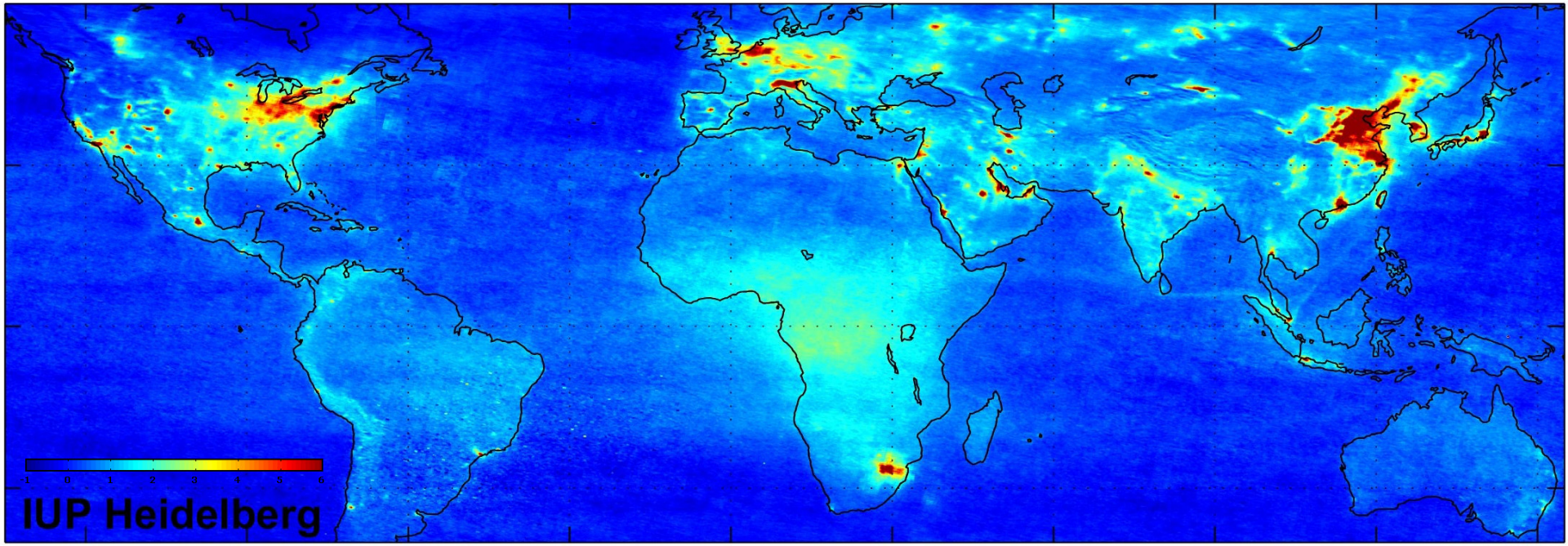
BACKGROUND AND RATIONALE

When we start the project (2013) association between long-term exposure to air pollution and adverse health effect were based on few cohort studies from USA, Canada, Japan, Netherlands, Denmark, Norway, with restrictions on age of cohort recruited, pollutant studied, and with poor geographical variability (mainly urban settings)

No studies were available in southern Europe

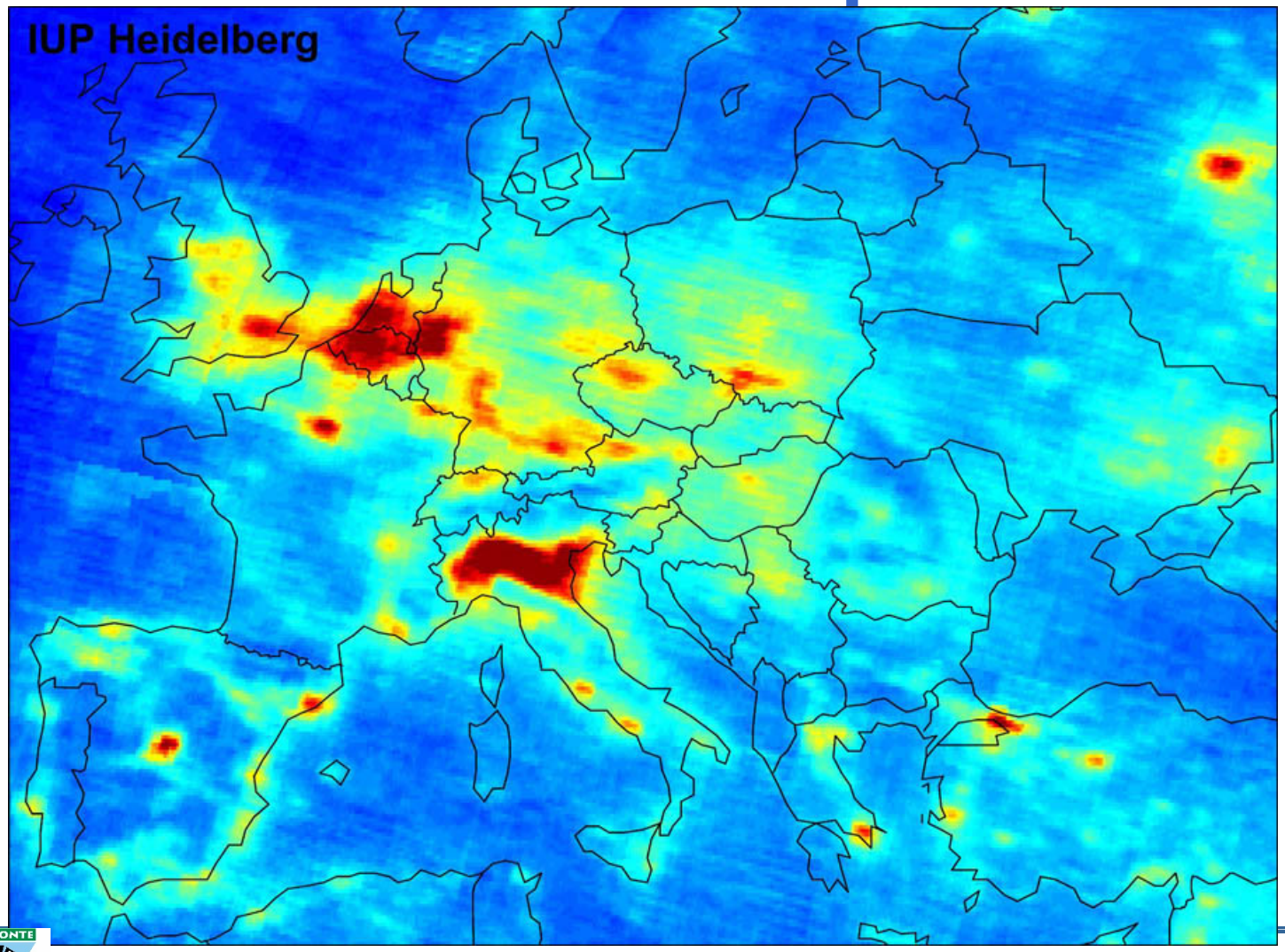
RR from northern American cohorts, exposed to different particulate chemical composition as well as characterised by different population characteristics were not the best choice for a health impact assessment in Southern Europe, even if it's one of the most polluted areas in the world

Map of NO2 pollution in the world. Envisat satellite - SCIAMACHY



The image shows the global mean tropospheric nitrogen dioxide (NO_2) vertical column density (VCD) between January 2003 and June 2004, as measured by the SCIAMACHY instrument on ESA's Envisat. The scale is in 10^{15} molecules/cm^{-2}.

NO2 in Europe



THE MED HISS PROJECT

Project partners

MED HISS Overview

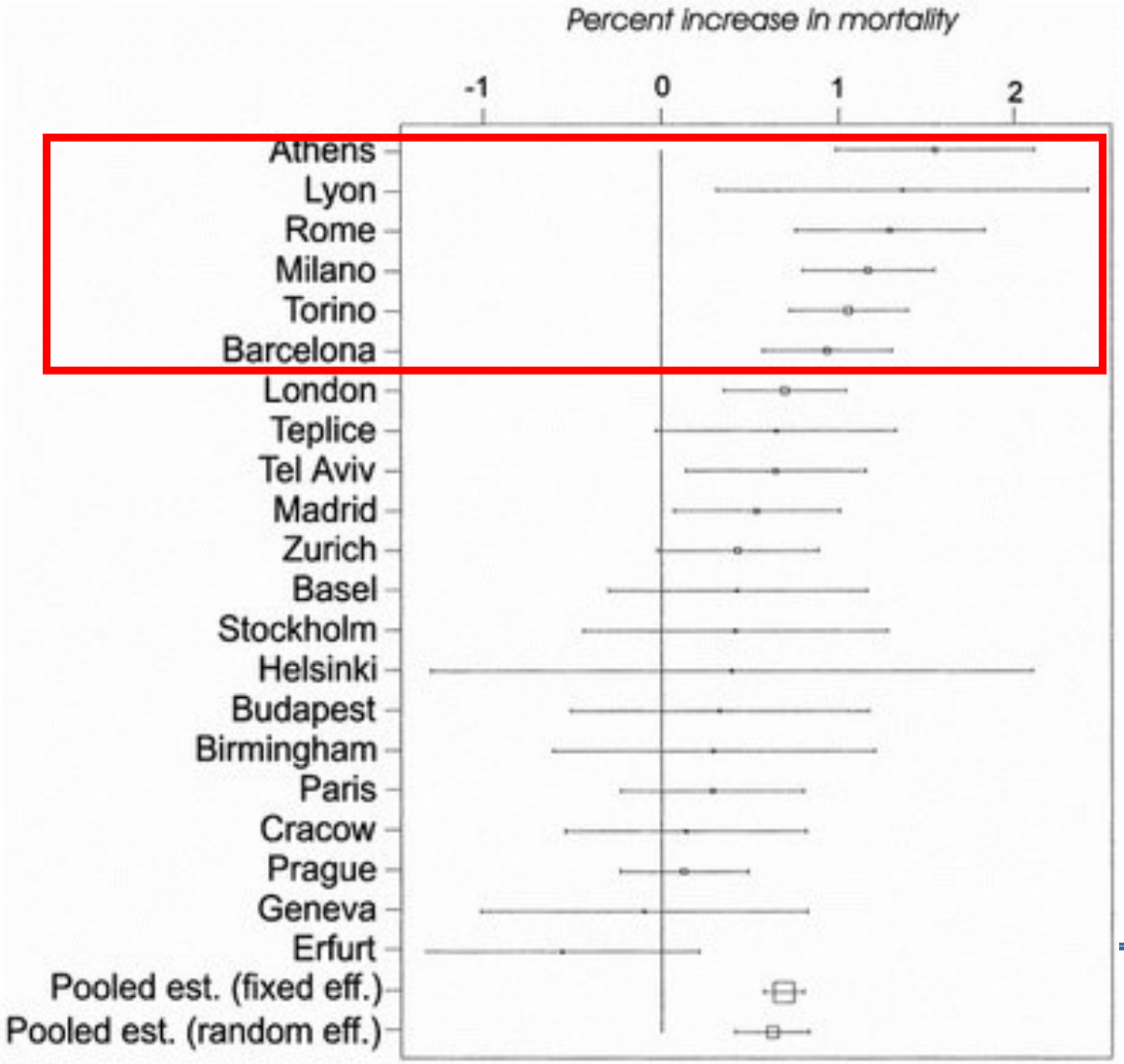
Setting up of a surveillance system to monitor long term effect of air pollution (PM 2.5, PM 10, NO2, O3) in 4 Mediterranean countries: Italy, Spain, France, Slovenia

Materials and Methods

2 individual approaches based on national cohorts (Italy, France) and 2 ecological approaches (Spain, Slovenia) based on mortality and morbidity analysis at individual and ecological level

Air pollution exposure modelled at national level as annual mean with a grid of 4x4 Km (1x1 Km for some country)

PM_{10} and mortality : results of the APHEA2 study



Katsouyanni K *et al*
Aphea2 project:
Particles and mortality
EPIDEMIOLOGY
September 2001,
Vol. 12 No. 5

- **Risk increase for increase of 10 μg/m³ of PM10**
- **FE: 0.68 (0.6-0.8)**
- **RE: 0.62 (0.4-0.8)**

OPEN QUESTIONS

The high risks present for short-term effects in Med countries are also present for long term effects?

Do rural areas show high and persistent risks as well?

What are the risks for hospital admissions?

Are there some susceptible population for whom the risk is higher than for the general population?

Are there other cancer risks beside lung cancer?

MED-HISS objectives:

- consolidate the knowledge base for the development, assessment, monitoring and evaluation of environmental policy and legislation,
- setting up a surveillance system of long term effects of air pollution in southern Europe
- building up retrospective cohorts where available recruited using National Health Interview Survey (NHIS) data (representative of all populations and areas of residence) followed-up for mortality and morbidity
- Performing ecological analysis where necessary
- homogenising dispersion models for each country at a grid of at least 4x4 Km (1x1 Km where available)

The project consisted of 7 main actions:

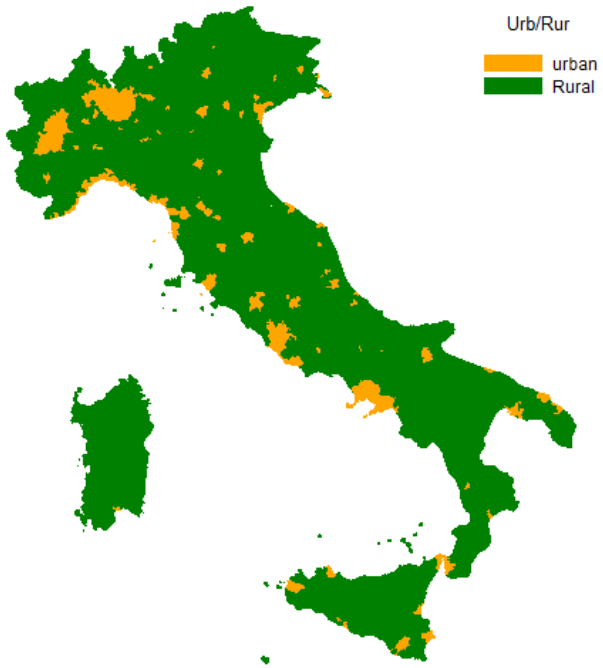
1. Collection of air pollution existing dispersion models and pollutant mapping
2. Collection of health data: NHIS data, mortality data, morbidity data at individual and ecological level
3. Pooling together health and air pollution data (data linkage)
4. Risk estimation of long term effect of PM2.5,PM10, NO2, O3.
5. Health impact assessment (HIA) of air pollution in four EU countries: (Slovenia, Italy, France, Spain)
6. Communication and dissemination
7. Co-ordination, management and monitoring.

MED HISS strengths:

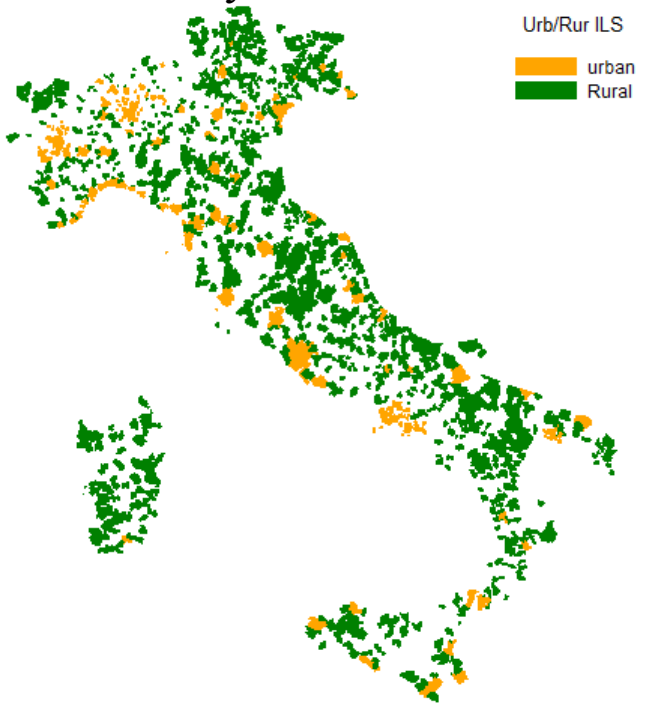
- Southern Europe
- rural areas
- risks for hospital admissions
- suscepible populations
- wide number of outcomes to be studied
- comparison individual-ecological approach

Urban /Rural differencies:division of italian territory

Urban /Rural - the whole italian territory



Urban /Rural - the 1449 municipalities in the Italian Survey



MED HISS RESULTS

- Estimates of the long term effects of PM10, PM2.5, NO2 and O3 on mortality and hospitalisation for all natural causes, all cancers, lung cancer, cardiovascular and respiratory diseases and asthma, (Actions B.5 and B.6).
- A validated procedure describing in details the steps to be followed for cohort recruitment based on NHIS, useful for other EU countries and other EU projects (Action B.2).
- A protocol, a data base and a report describing different exposure assessment experiences in four countries in Europe, with an estimation of inter-country variations, transposing data from grid to municipality level (Action B.1).
- Evaluation of the feasibility of a simplified hybrid approach for air pollution exposure estimation, useful for future epidemiological studies (Action B.3).
- Health Impact Assessment of air pollution (Action B.7).

What happened and what was done

Privacy policy restrictions arose in Spain and Slovenia after the start of the project

(Ecological approach in these countries)

New solutions for privacy restrictions were found

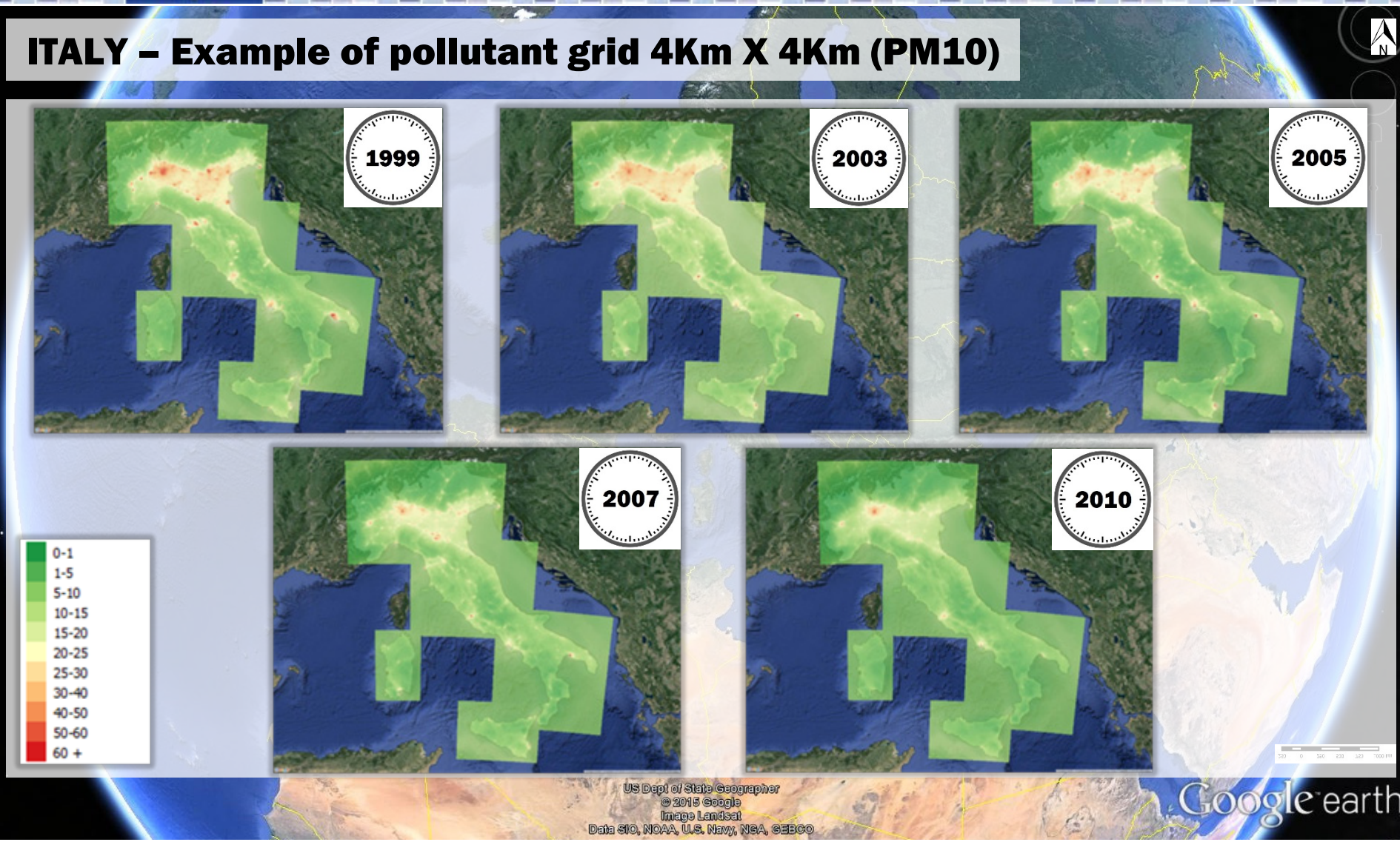
3 available chemical transport model were used (Italy, France, Spain)

1 model was built during the project (Slovenia)

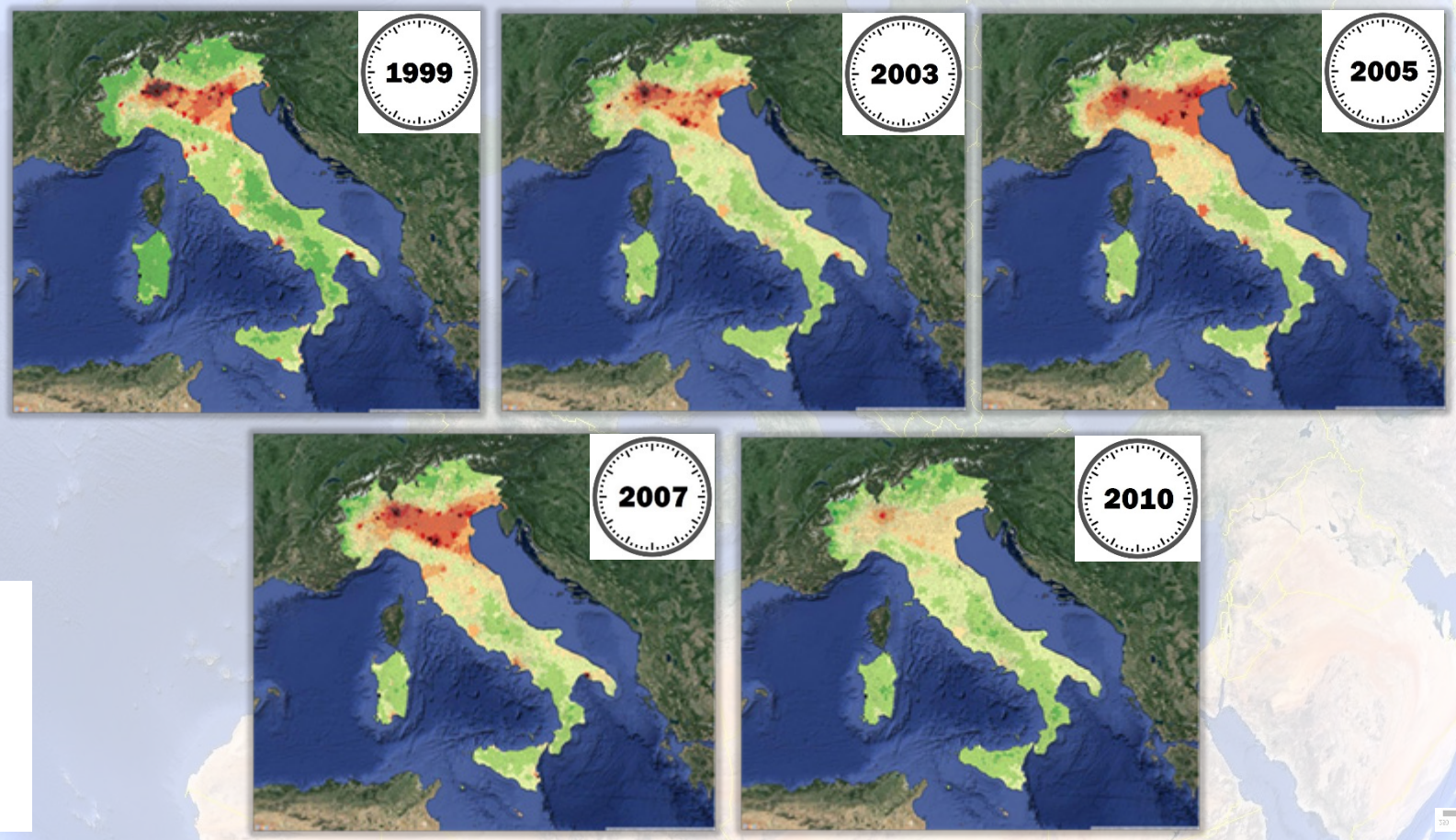
A new method combining model output, observations and built area was used to assess population exposure

Ecological and cohort analyses were performed

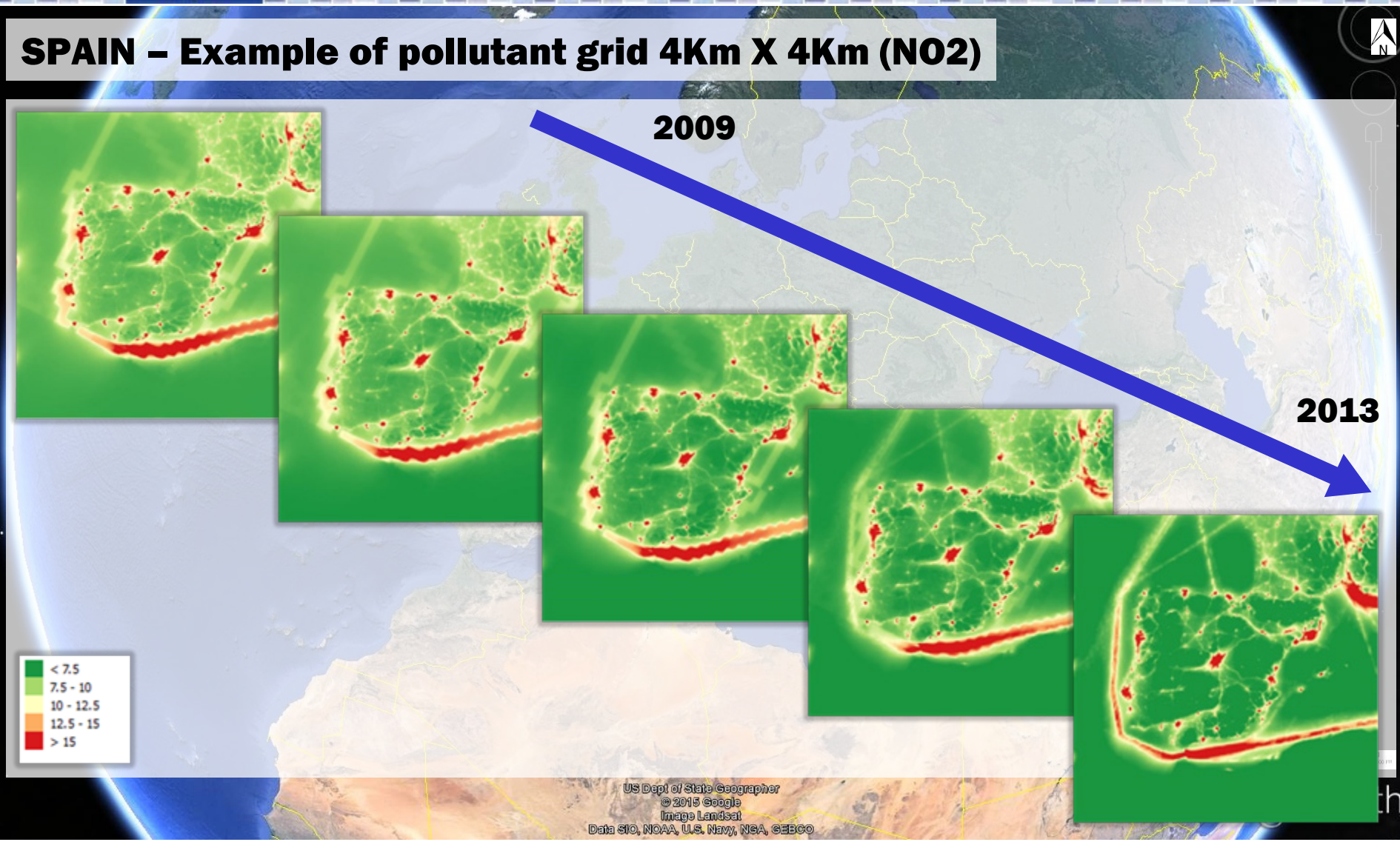
ITALY – Example of pollutant grid 4Km X 4Km (PM10)



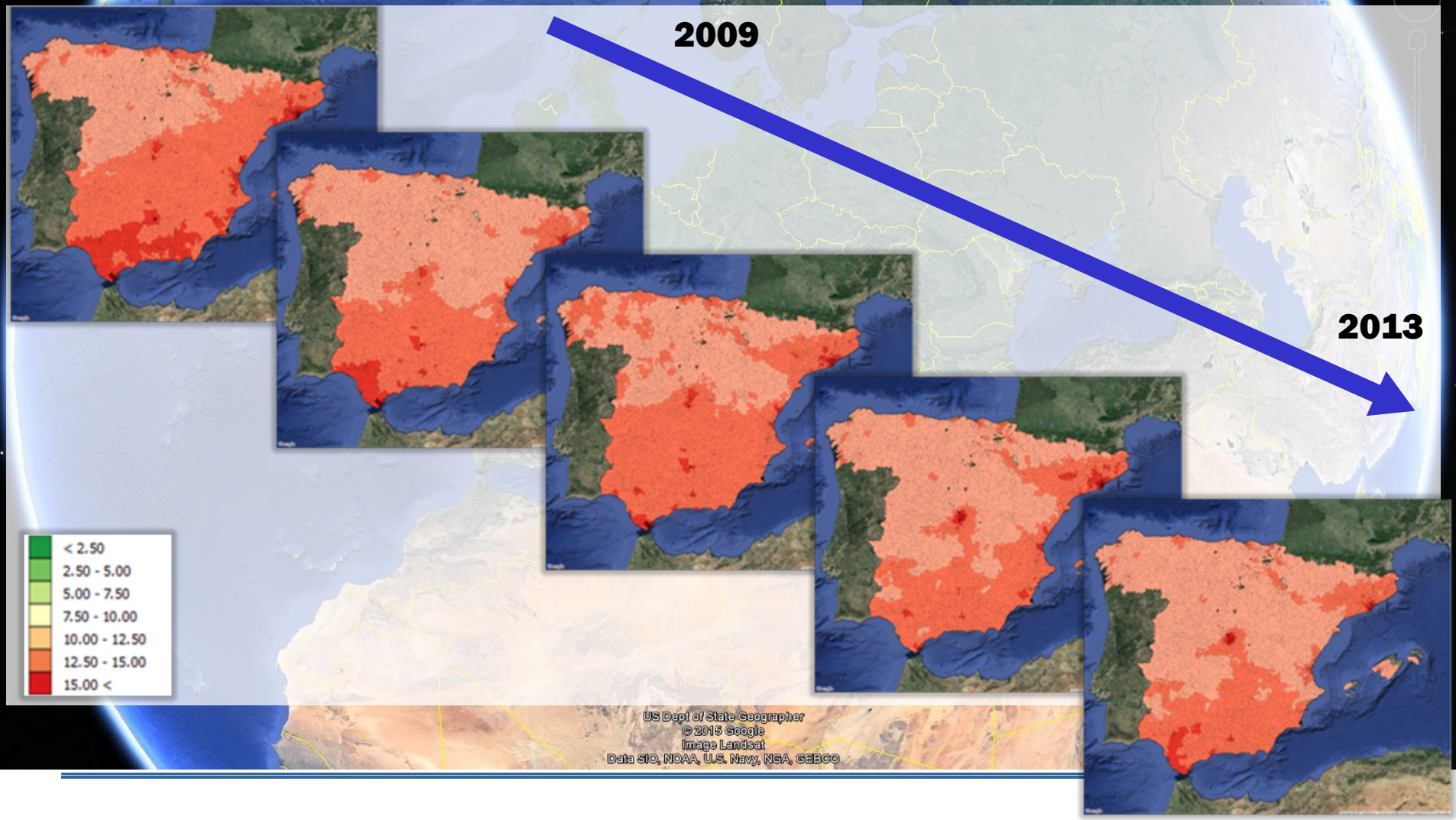
ITALY – Example of pollutant at municipality level (PM2.5)



SPAIN – Example of pollutant grid 4Km X 4Km (NO2)



SPAIN – Example of pollutant at municipality level (PM2.5)



MED HISS Detailed Results

See next presentations

www.medhiss.eu

After communication plan

FINAL REPORT

Communication Activities

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2 presentazioni orali e 1 poster

MED HISS 2013-2016

Thanks for your attention