

Visualization and mapping ICP Vegetation moss survey results in Croatia

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Structure of presentation

About project

Cartographic representation of results

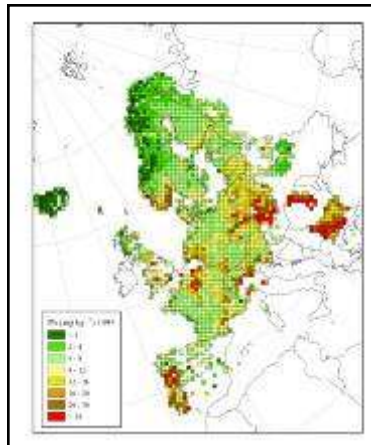
Investigation of more appropriate model of data
visualization



About project

International Cooperative Programme on Effects of
Air Pollution on Natural Vegetation and Crops

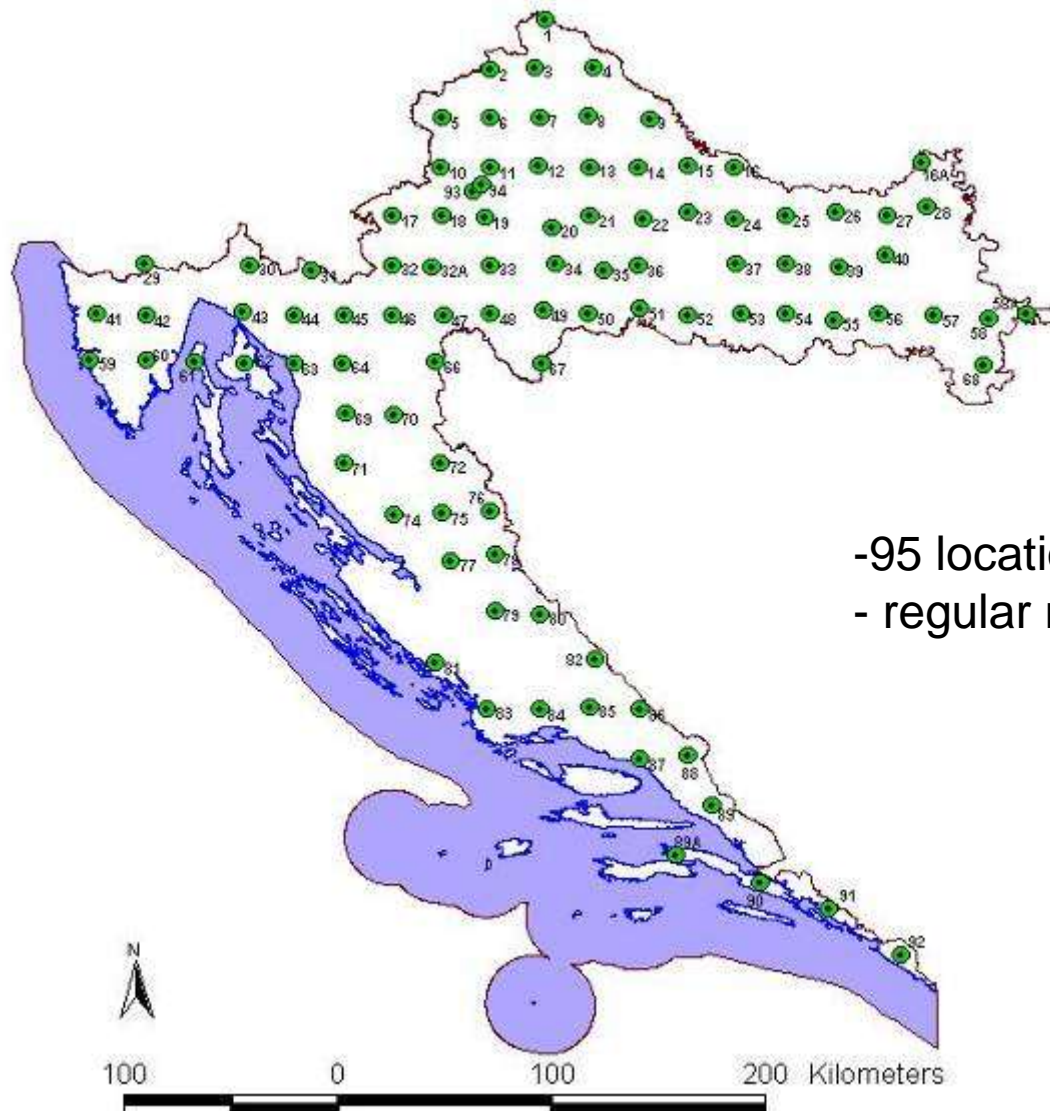
<http://icpvegetation.ceh.ac.uk>



European surveys conducted every five
years since 1990

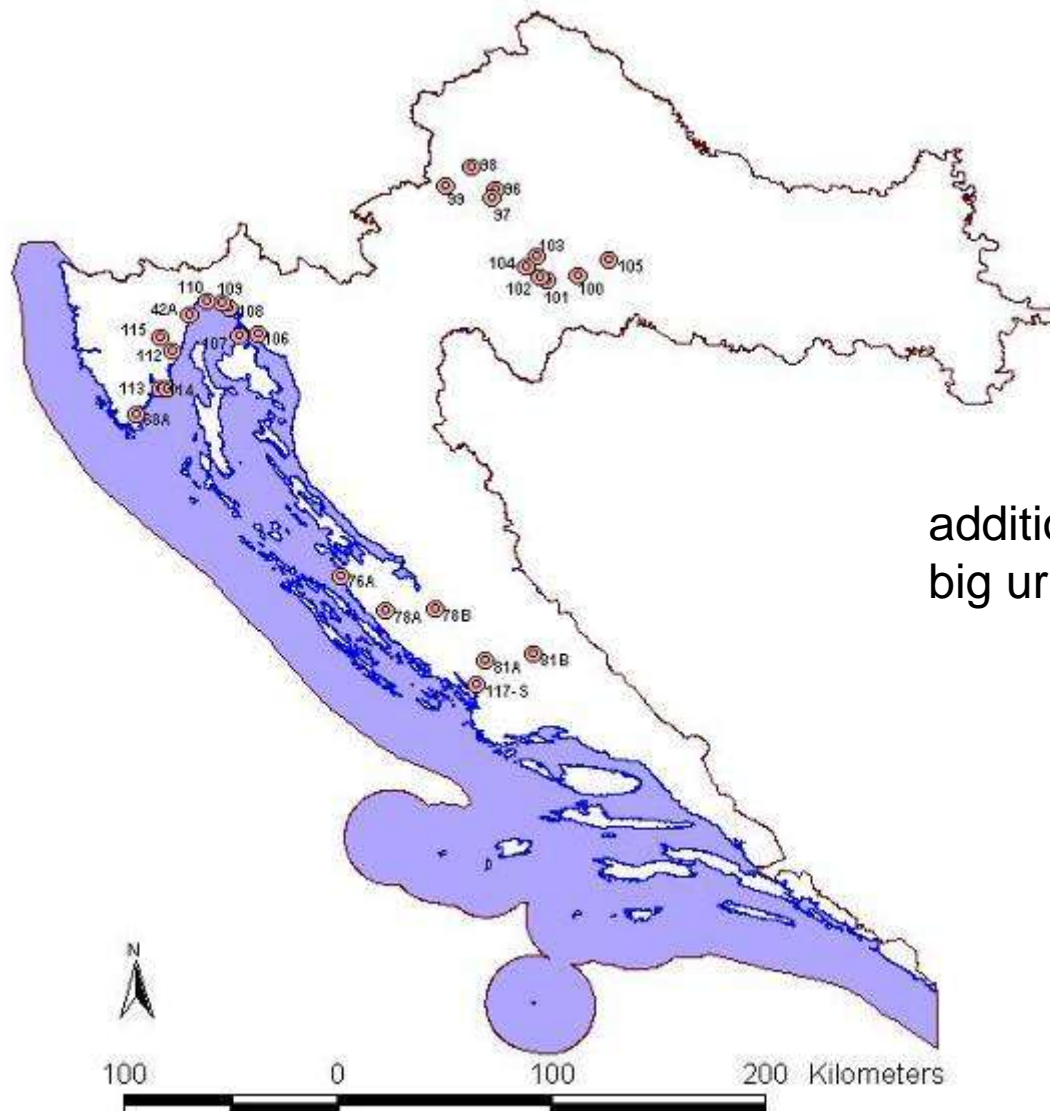
Croatia participate in moss survey since 2005

Samples collected 2006



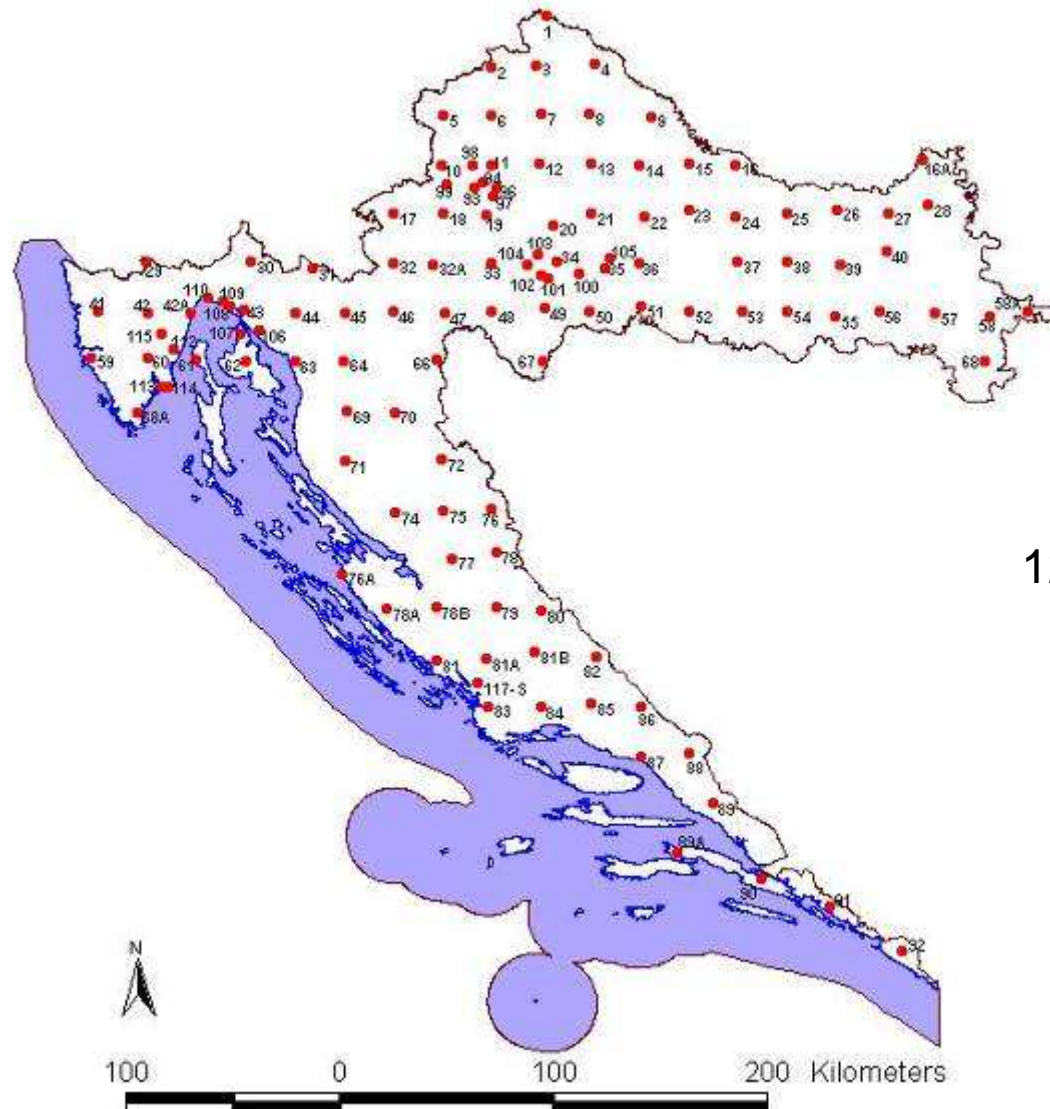
-95 locations
- regular network 23 x 23 km

Added points in 2010



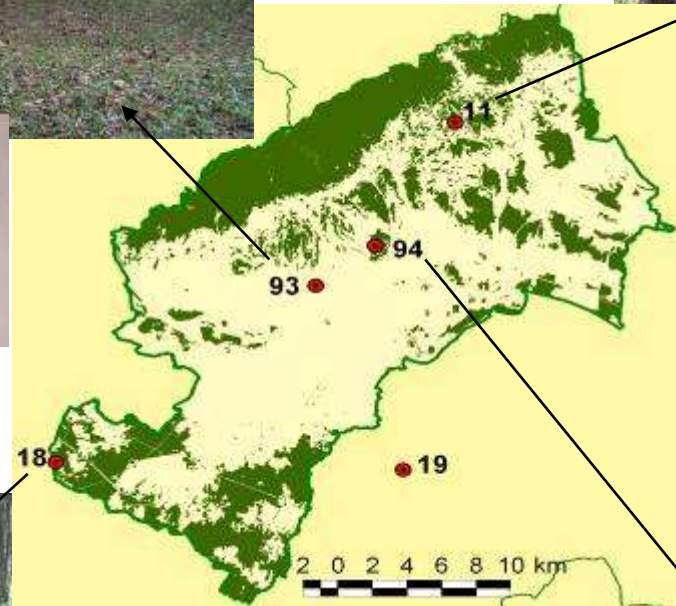
additional samples around
big urban/industrial areas

Samples collected in 2010




121 locations

Samples collection in the field



Samples preparation for analysis

The collage illustrates the steps of sample preparation: collection (moss on ruler), pressing into a mold, labeling (stack of envelopes), mechanical pressing (person at machine), and the final pressed sample (hand holding mold and sample).

 Oikon - Institute for Applied Ecology

8th Cartography and Geoinformation Conference, Zagreb, September 28, 2012



Analysis of samples

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La*	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra	Ac**															

*	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
**	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lw

42

■ Elements determined in moss by NAA

■ Elements determined by AAS

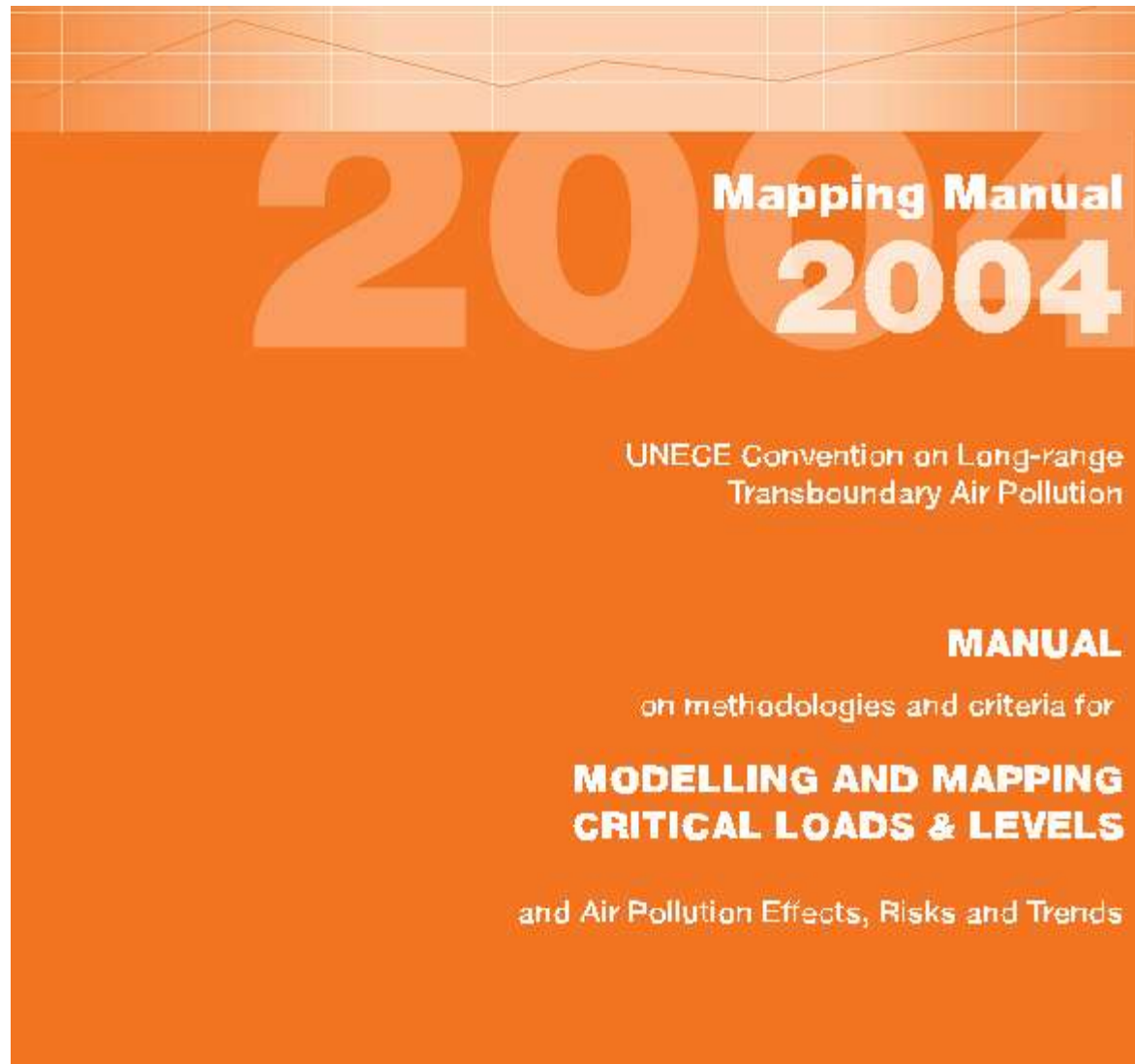
ATLAS: Al, As, Cd, Cr, Cu, Fe, Hg, Ni, Pb, Sb, V, Zn

NAA - Neutron Activation Analysis

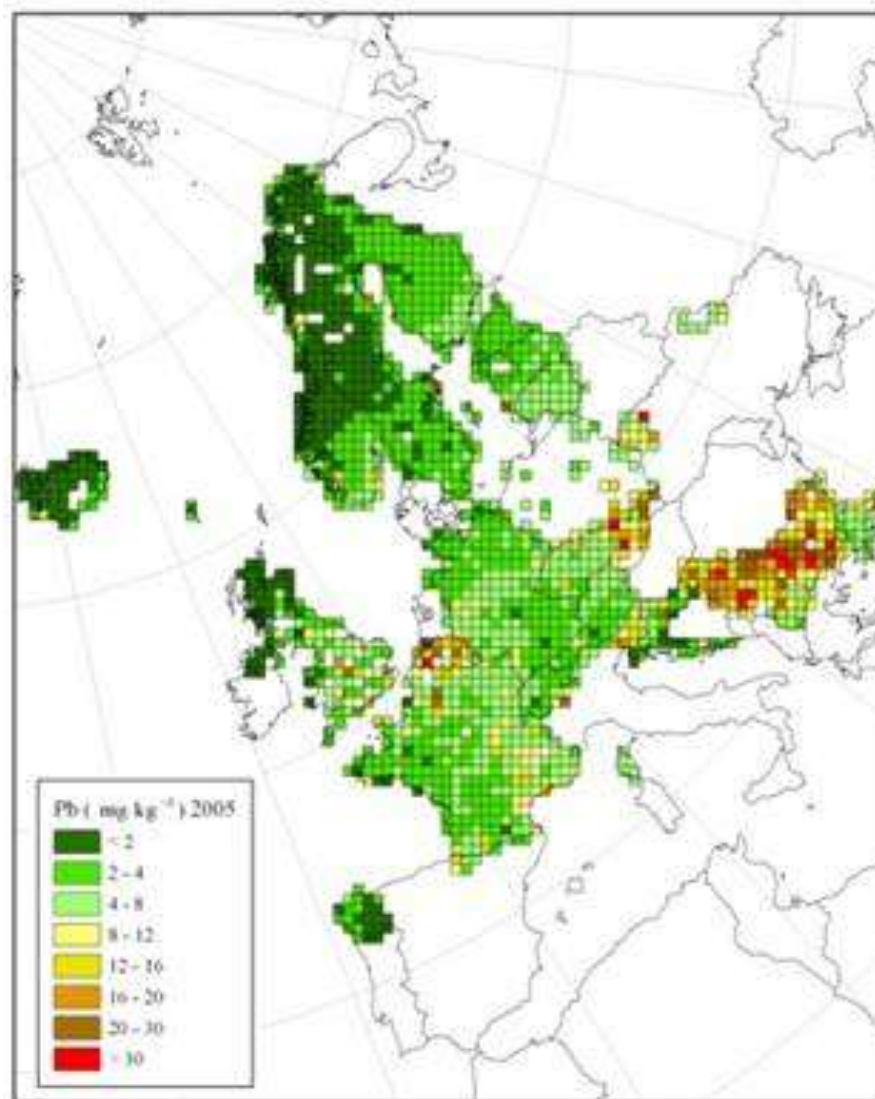
AAS - Atomic Absorption Spectrometry



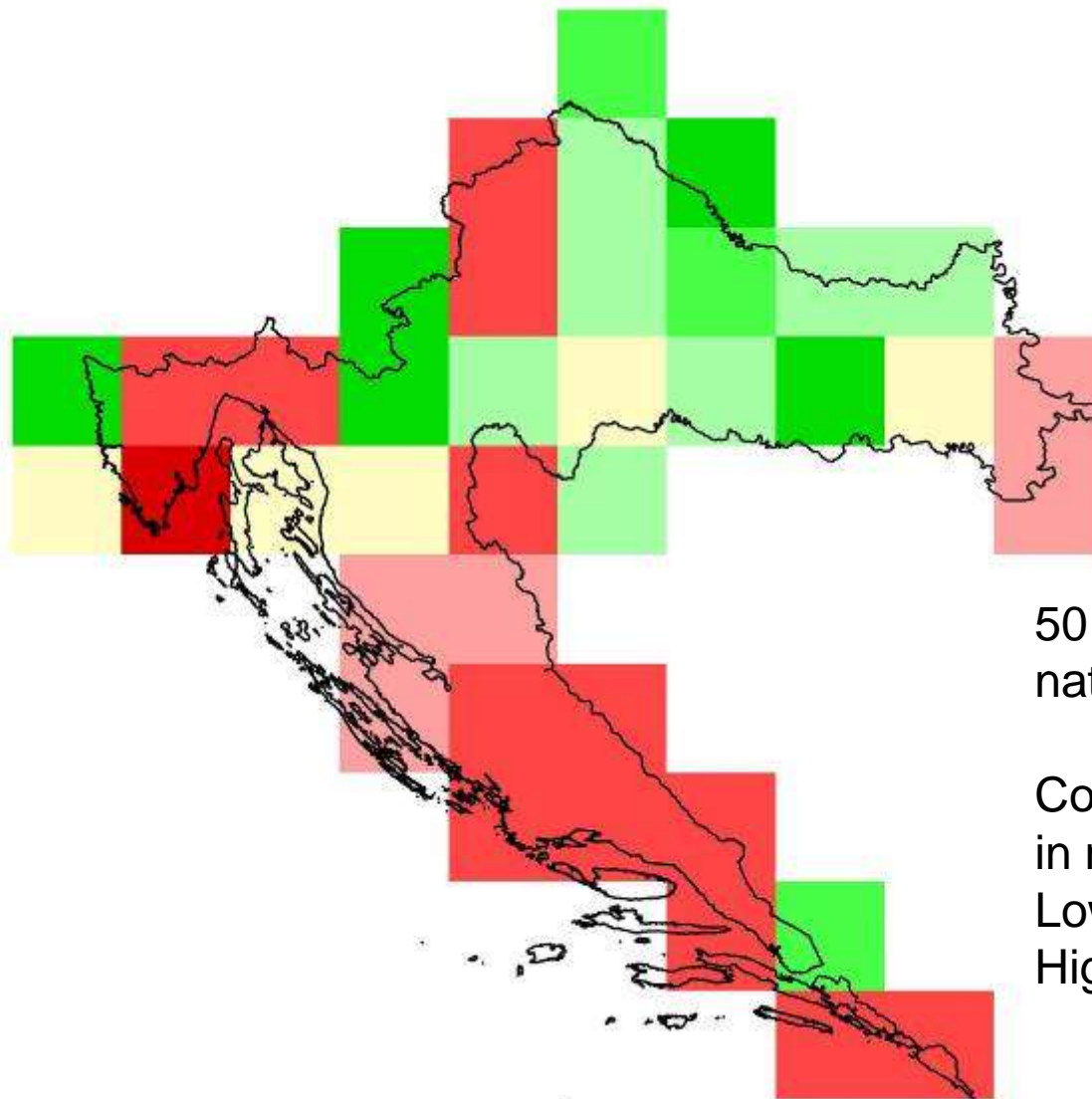
Official cartography of the project



Stereographic polar projection



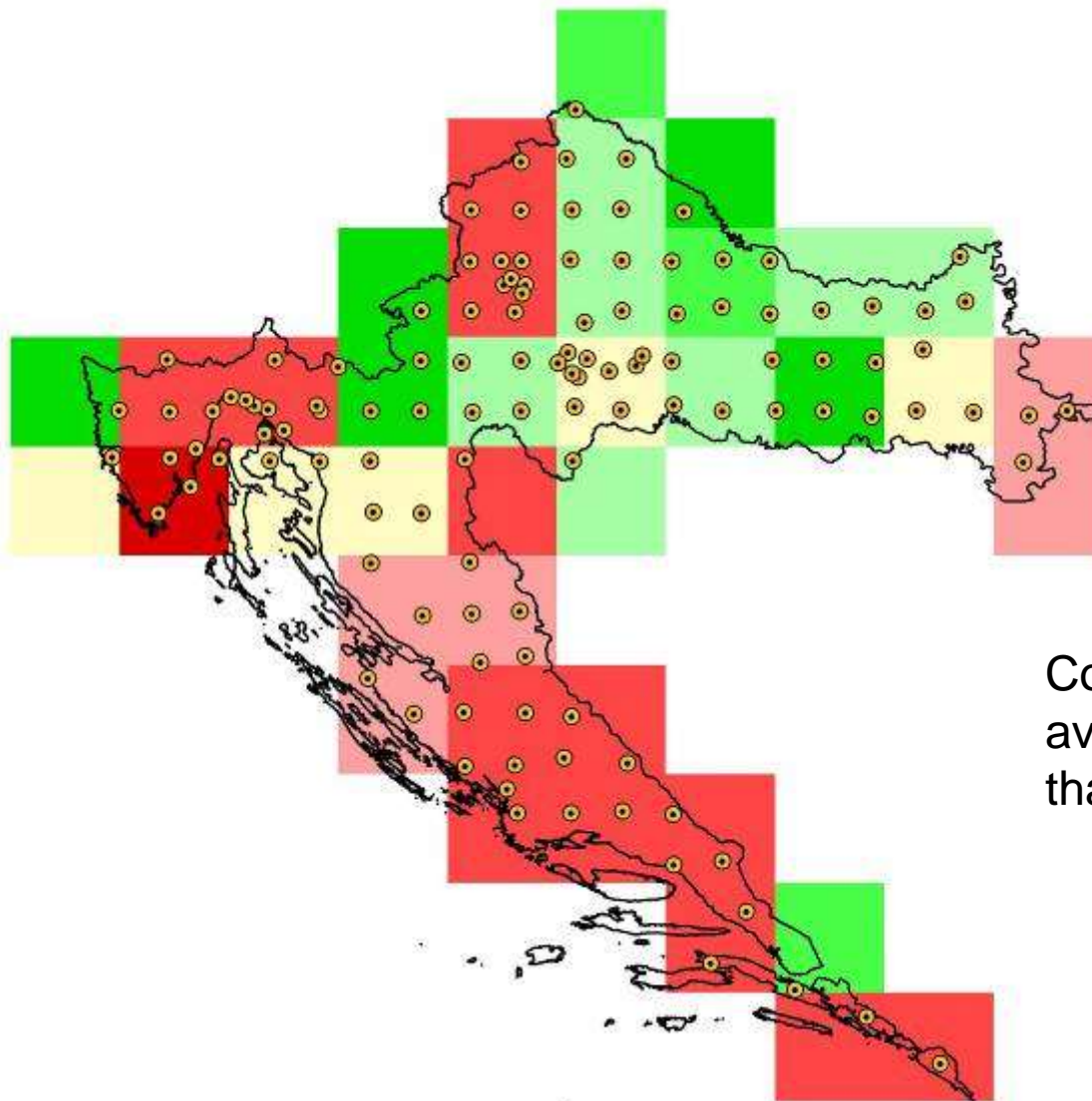
Example of chromium in Croatia



50 km x 50 km net in
national projection

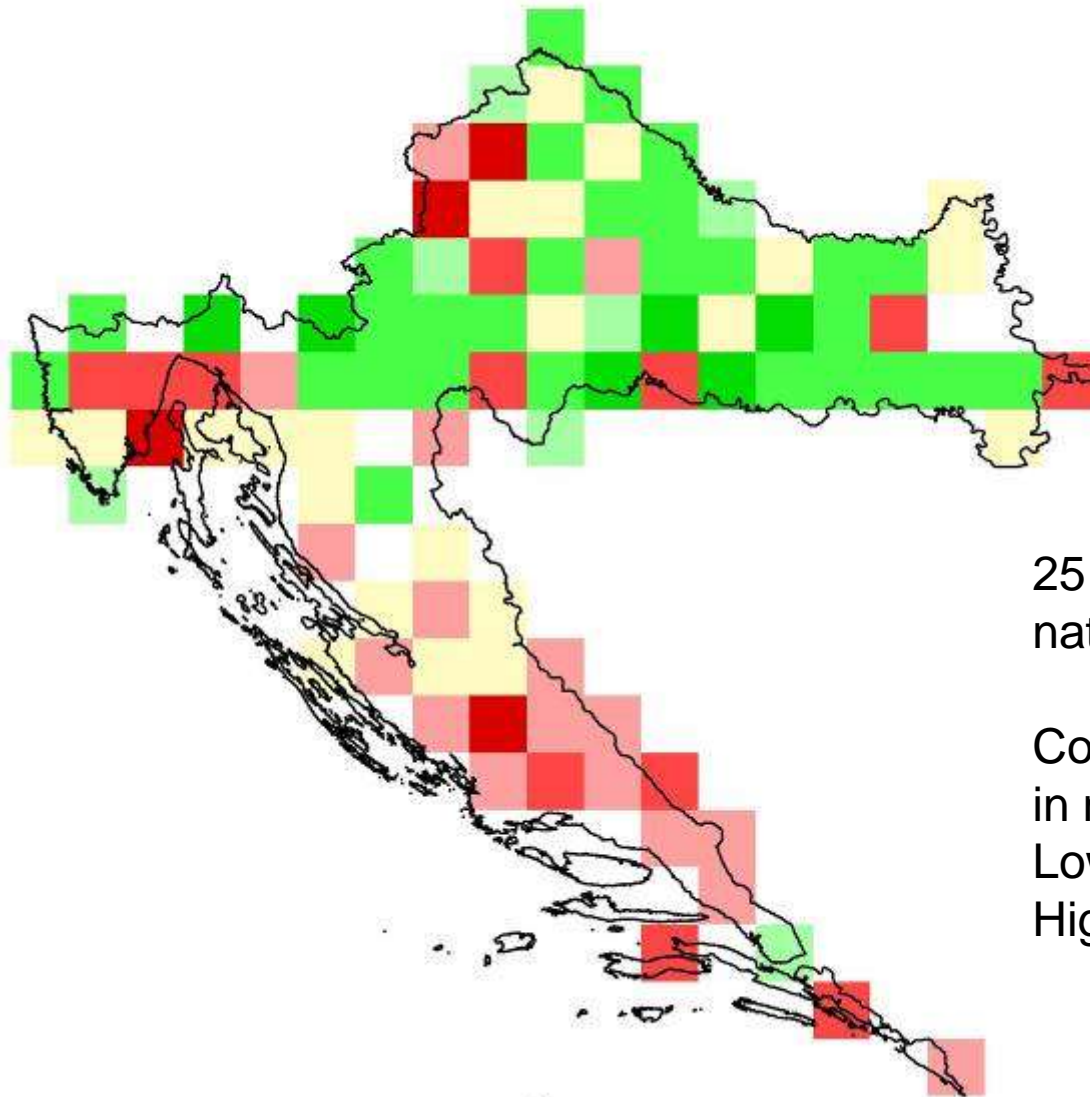
Content of chromium
in mg/kg
Low green
High red

Example of chromium in Croatia



Content in cell is
average of samples
that falls in the cell

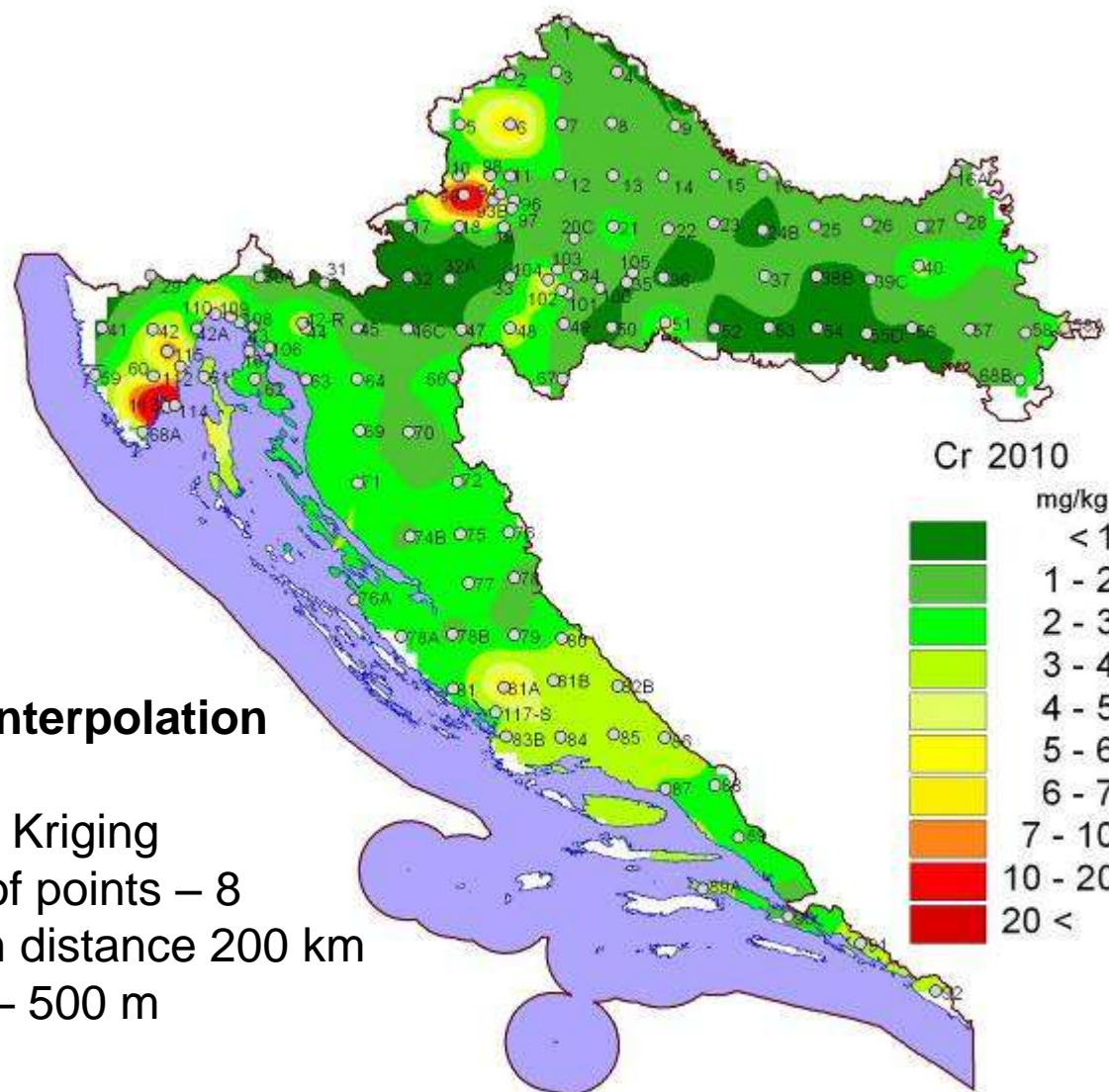
Example of chromium in Croatia



25 km x 25 km net in
national projection

Content of chromium
in mg/kg
Low green
High red

Example of chromium in Croatia



Kriging interpolation

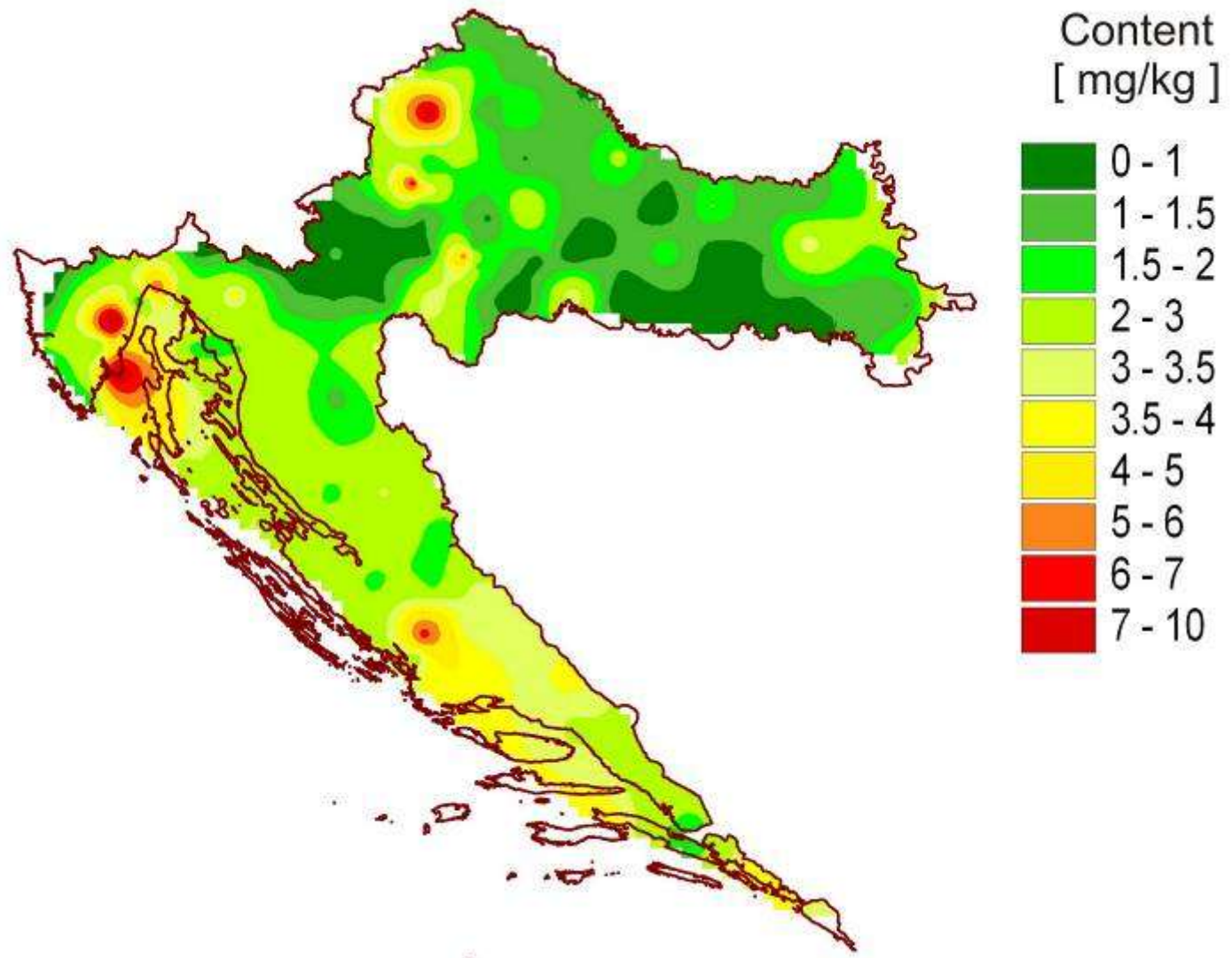
Universal Kriging

Number of points – 8

Maximum distance 200 km

Grid cell – 500 m

Example of chromium in Croatia

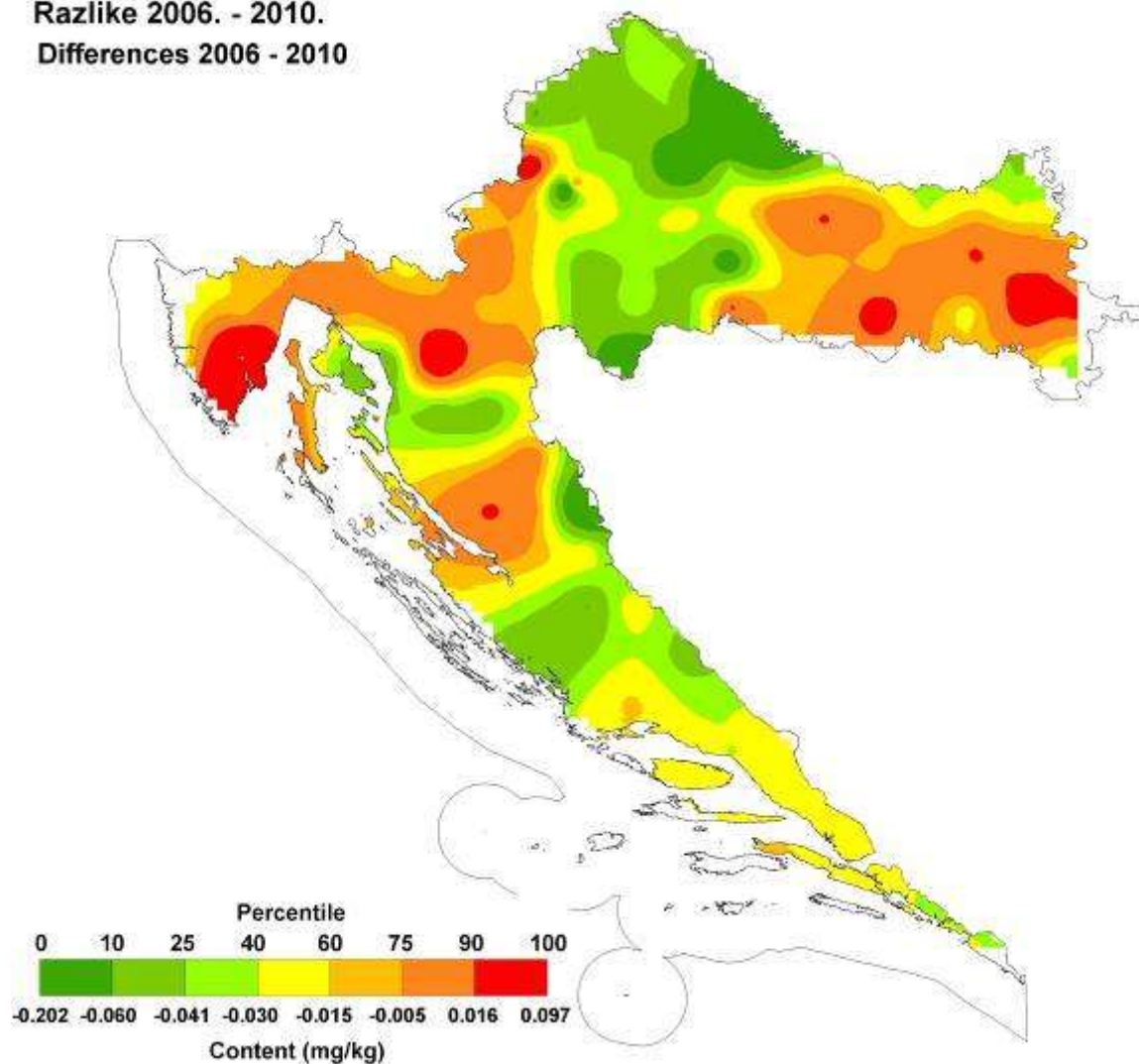


Analysis of differences 2006 - 2010

Hg

Razlike 2006. - 2010.

Differences 2006 - 2010

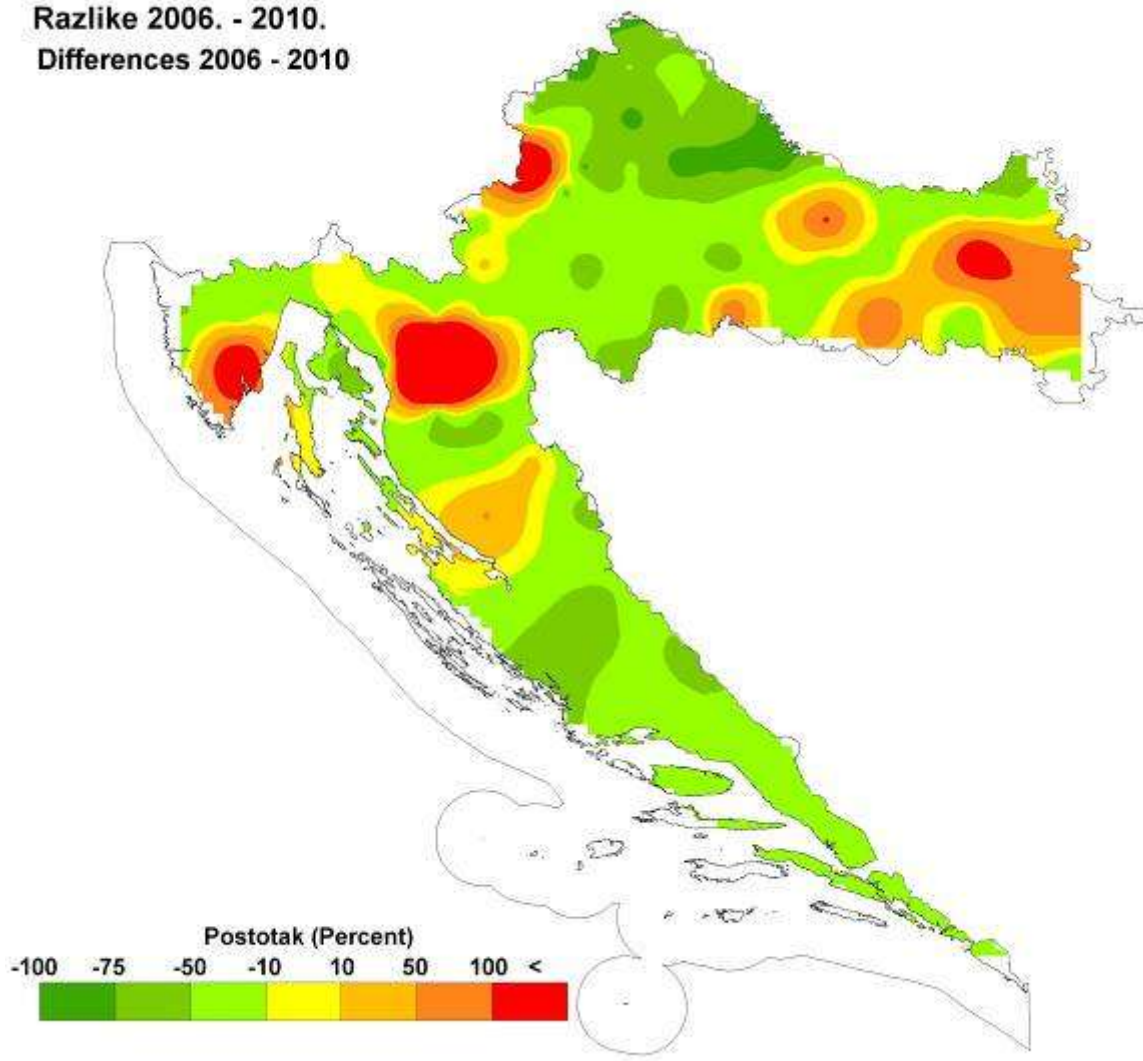


Analysis of differences 2006 - 2010

Hg

Razlike 2006. - 2010.

Differences 2006 - 2010



Analysis of overall deposition

Descriptive statistic for all chemical elements on 121 locations.

Factor analysis:

Method – principal components

Rotation - varimax raw

Calculated factors - 6

Minimum eigenvalue - 1

No variables standardisation was performed

Explained variance - 75,7 %

Significant loadings were chosen for loadings >0.65

Analysis of overall deposition

Spatial distribution – spatial interpolation was done for all factors that explain more than 10 % of variance (factor 1, Factor 2, and factor 3) and for factor 5 that explain 9.9 % of variance.

Universal Kriging

Number of points – 8

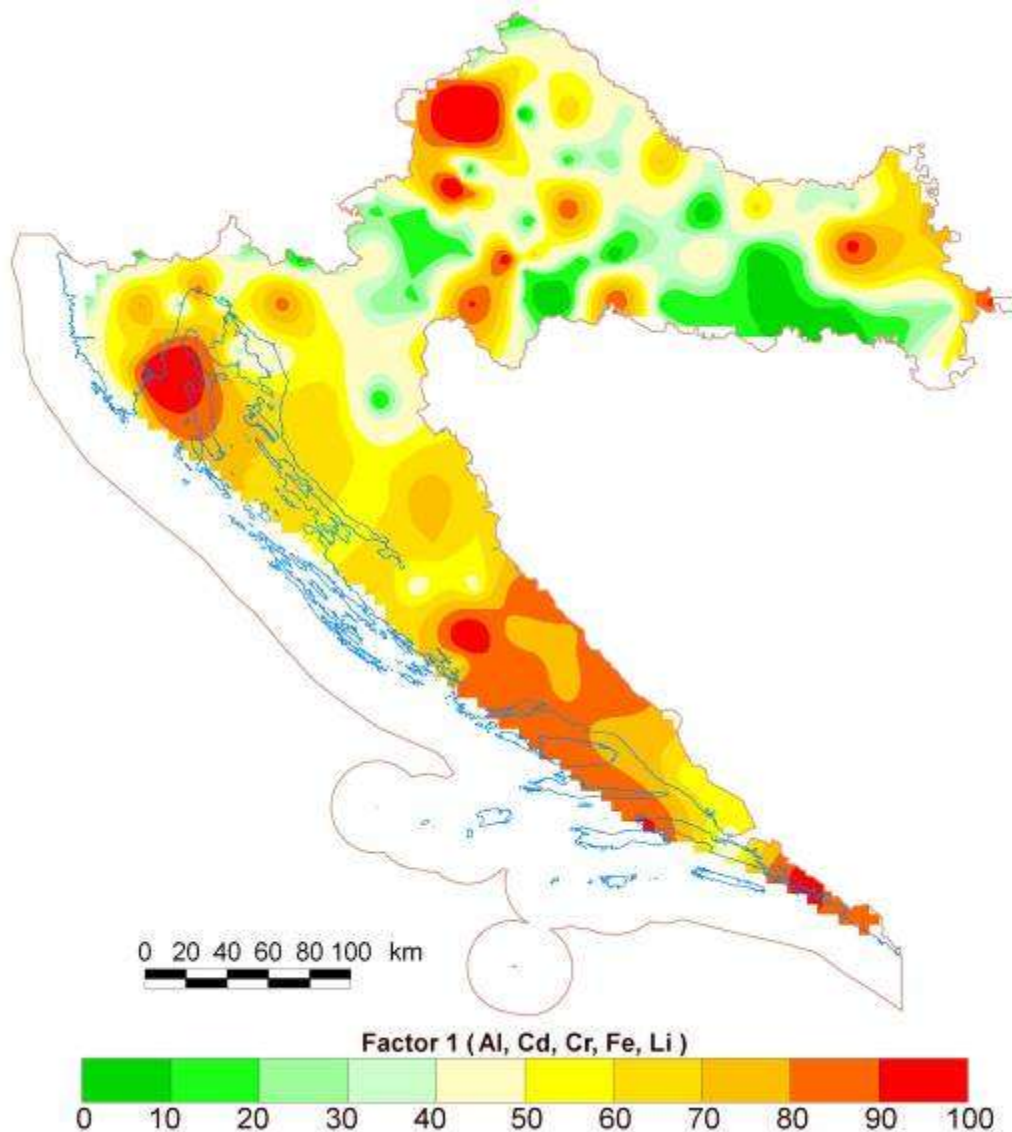
Maximum distance 200 km

Grid cell – 500 m

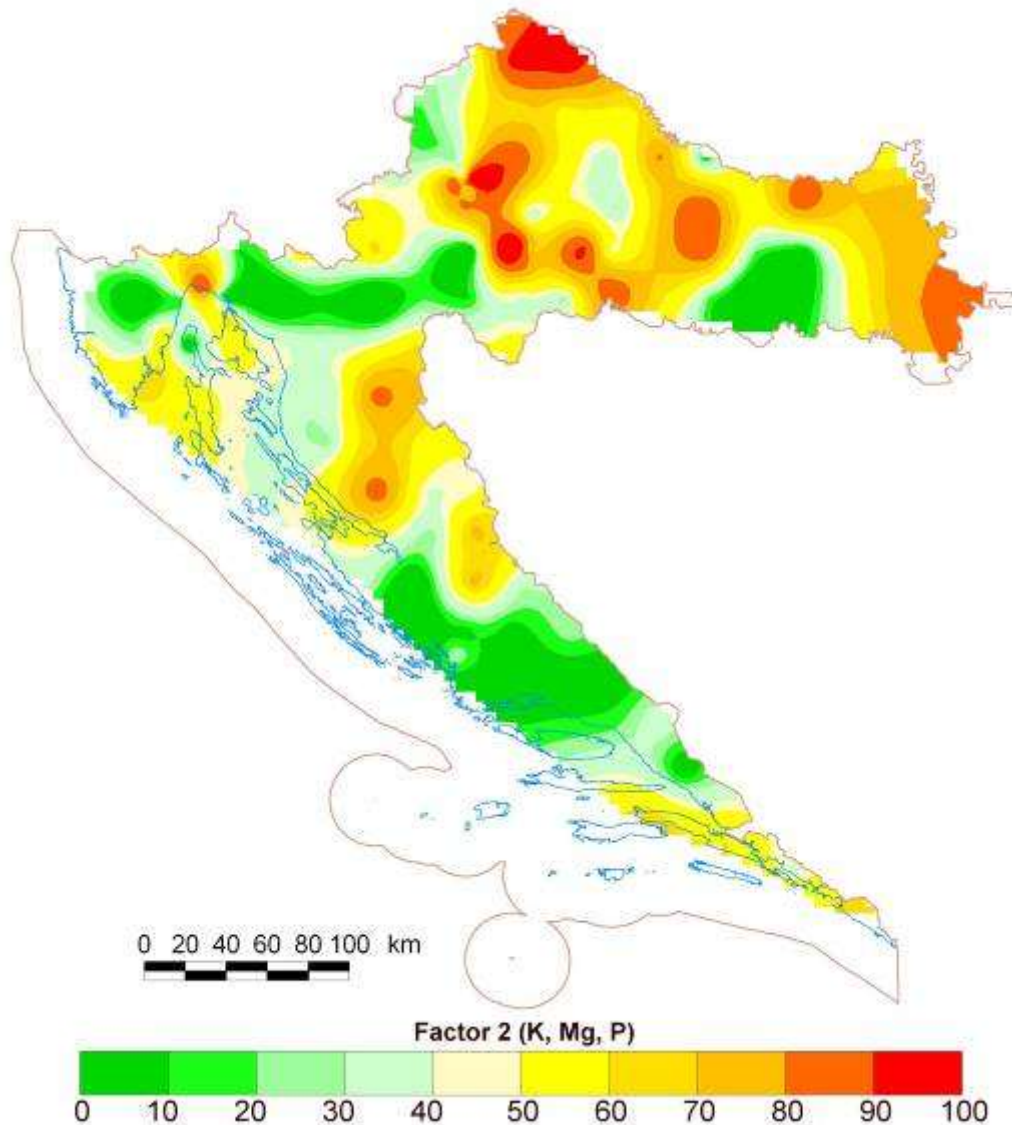
Spatial representation for interpolated factor were made by using percentile class limits of 10 (0-10, 10-20, 20-30,...,90-100).



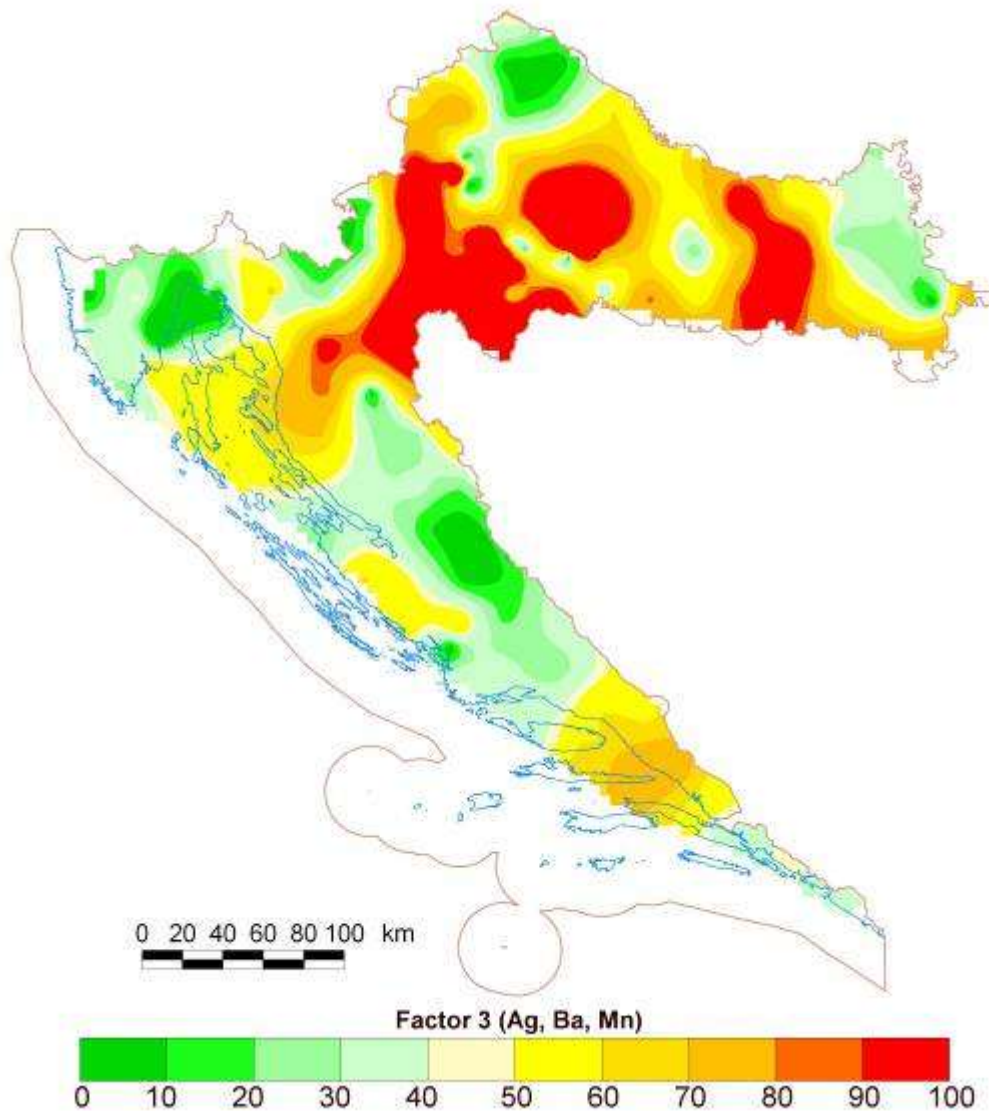
Analysis of overall deposition



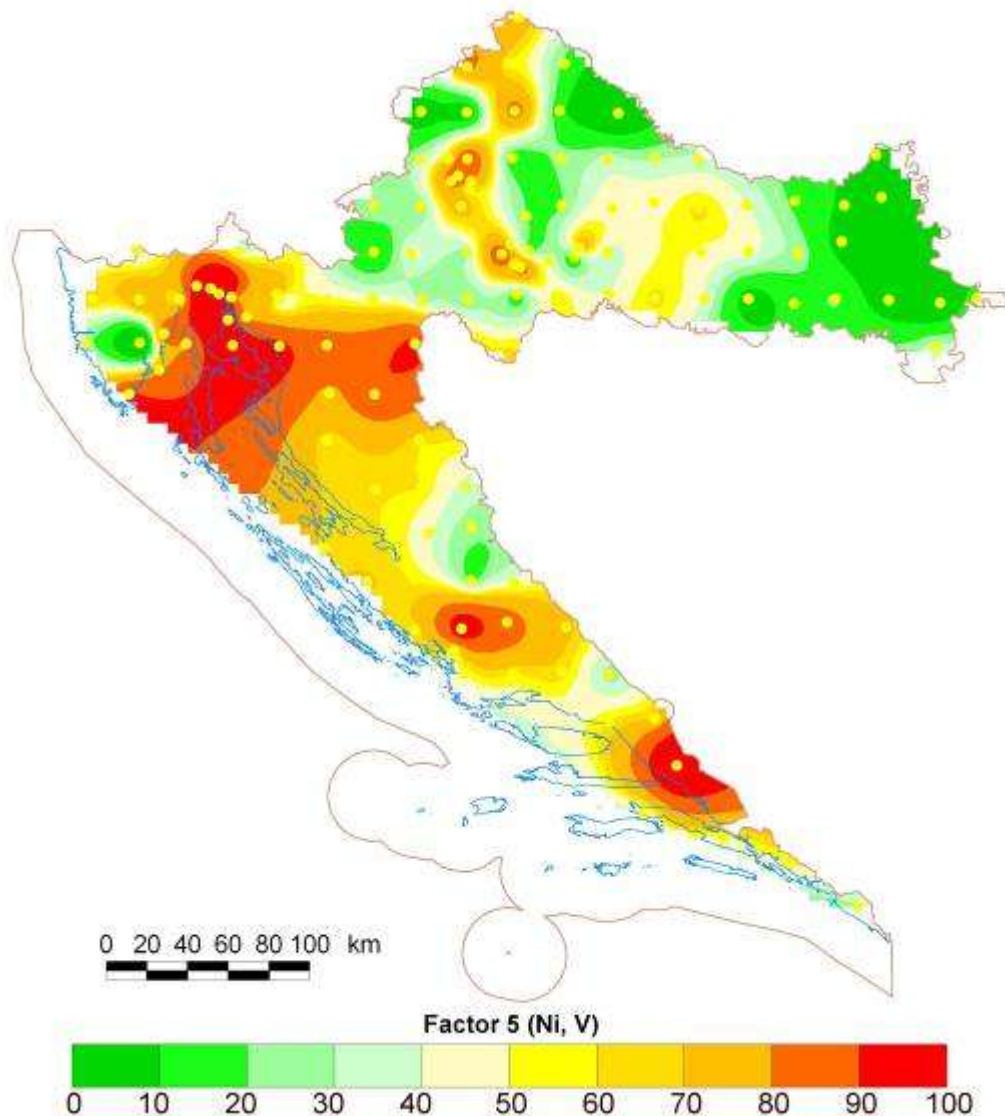
Analysis of overall deposition



Analysis of overall deposition



Analysis of overall deposition



Thank for your attention

