

Documentation of Rabies in Austria 1945 - 2003

Task Force Subgroup RABIES

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Outline

- Motivation
- Documentation of rabies in Austria before 2000
- Georeferencing of rabies cases
- GIS solution on rabies mapping
- Selected results
- Outlook

Motivation

In spring 2000 we started with the preparation of a seminar on process modelling in veterinary epidemiology. Classical models in epidemiology were for example models for the description of the spatiotemporal dynamics of rabies in foxes.

These models were essential for understanding epidemics. For example Anderson et al. (1981) presented their classical paper on rabies modelling.

Models need observational data as input or for verification.

Situation in Austria: No overall documentation was published
No digital data sets exist

Anderson, R. M., H. C. Jackson, R. M. May, and A. M. Smith, 1981: Population dynamics of fox rabies in Europe. *Nature*, 289, 765-771.

Documentation of rabies in Austria before 2000

Previous results

6 papers published in the *Wiener Tierärztliche Monatsschrift* (WTM) on some details of the rabies epidemics in Austria - all in German language.

Grausgruber, W., 1976: Epidemiologie und Bekämpfung der Wutkrankheit in Österreich. WTM, 63, 37-39.

Glawischnig, E. und W. Jaksch, 1976: Diagnose der Wutkrankheit. WTM, 63, 39-43.

Krocza, W. und E. Scharfen, 1983: Über die Europäische Wildtierwut und ihre Bekämpfung. WTM, 70, 81-88.

Schmid, E., 1988: Erfahrungen mit der oralen Immunisierung von Füchsen gegen Tollwut in Vorarlberg. WTM, 75, 338-340.

Kissling, R., und G. Gram, 1992: Orale Immunisierung von Füchsen gegen Tollwut in Österreich im Zeitraum von 1986 bis 1991.

Deutz, A., B. Freitag, G. Romanek, J. Damoser und N. Nowotny, 1999: Untersuchung von Fledermäusen auf Tollwut in der Steiermark. WTM, 86, 367-370.

Documentation of rabies in Austria before 2000

What is missing

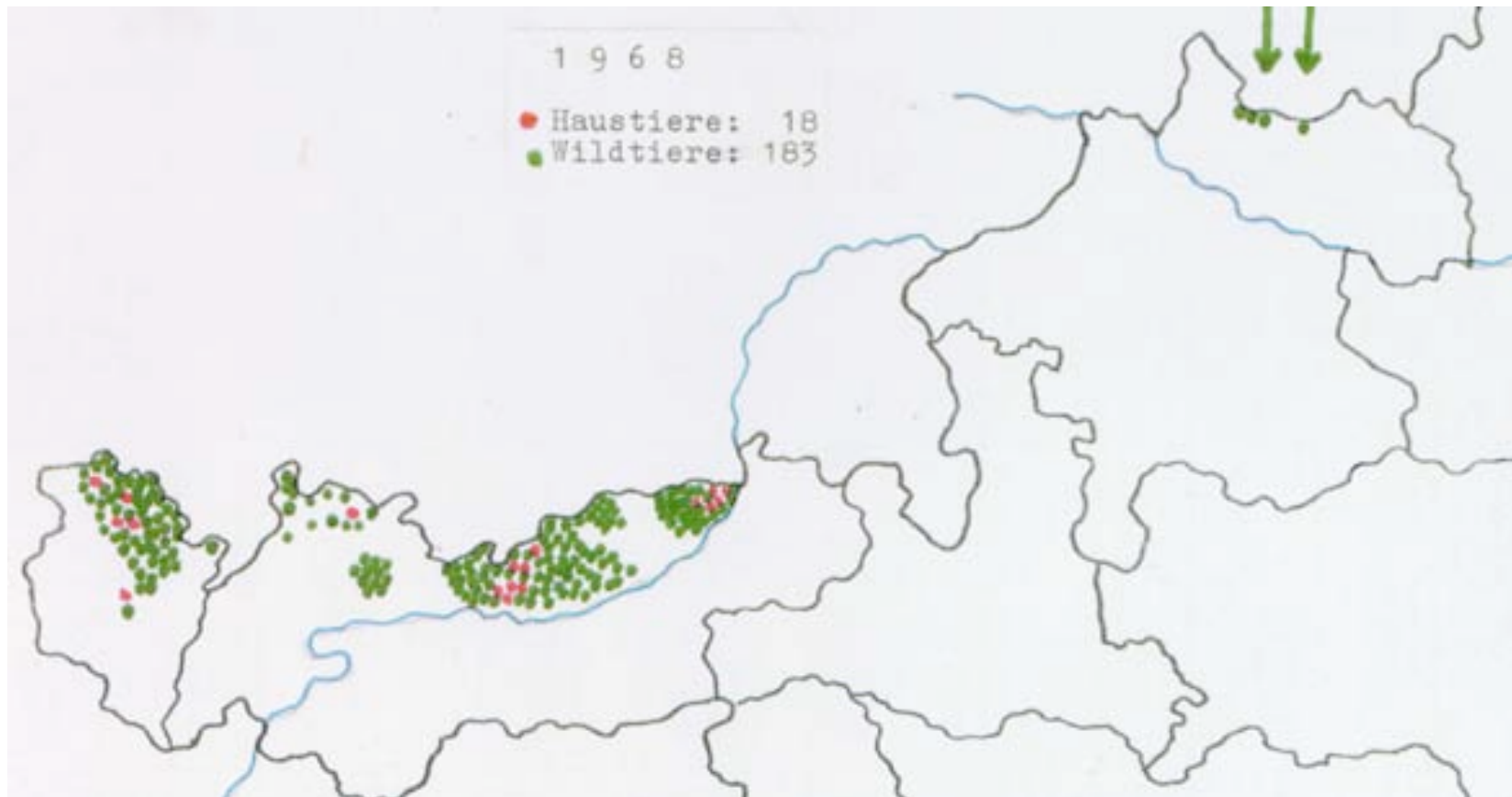
- Any publication that documents the historical population dynamics of rabies in Austria.
- Digital data sets and/or digital maps on rabies cases and vaccination areas.

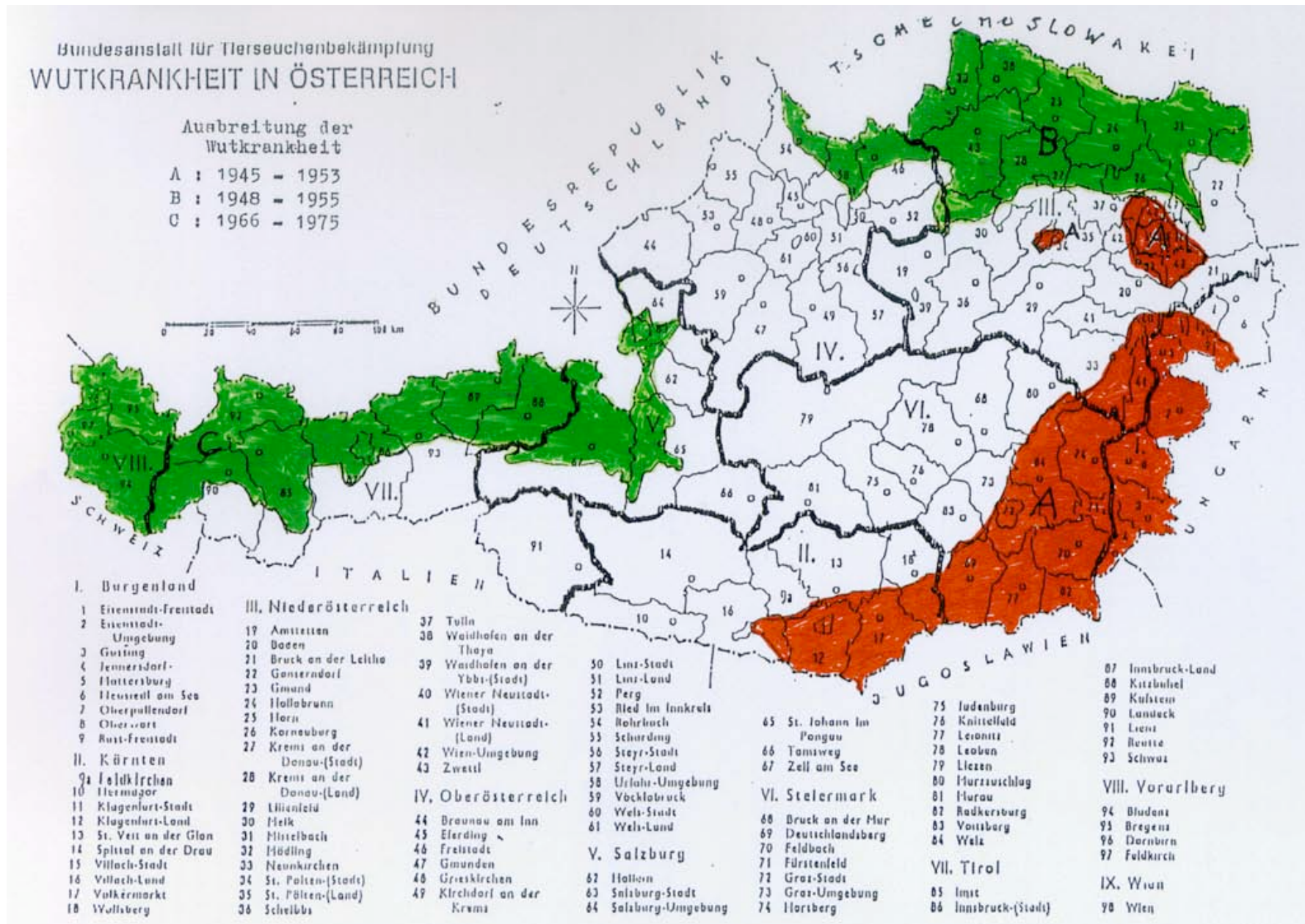
What is available

- **8 Folders of handwritten records** - an excellent unpublished documentation provided by the formerly Bundesanstalt für Tierseuchenbekämpfung in Mödling.

Documentation of rabies in Austria before 2000

Example of a historical map provided by the Bundesanstalt für Tierseuchenbekämpfung in Mödling





Digitising of historical rabies cases and vaccination areas

A total number of **34 264 rabies cases** have been digitised.
5 students spend several months for this work.



Photo: S. Bugaric

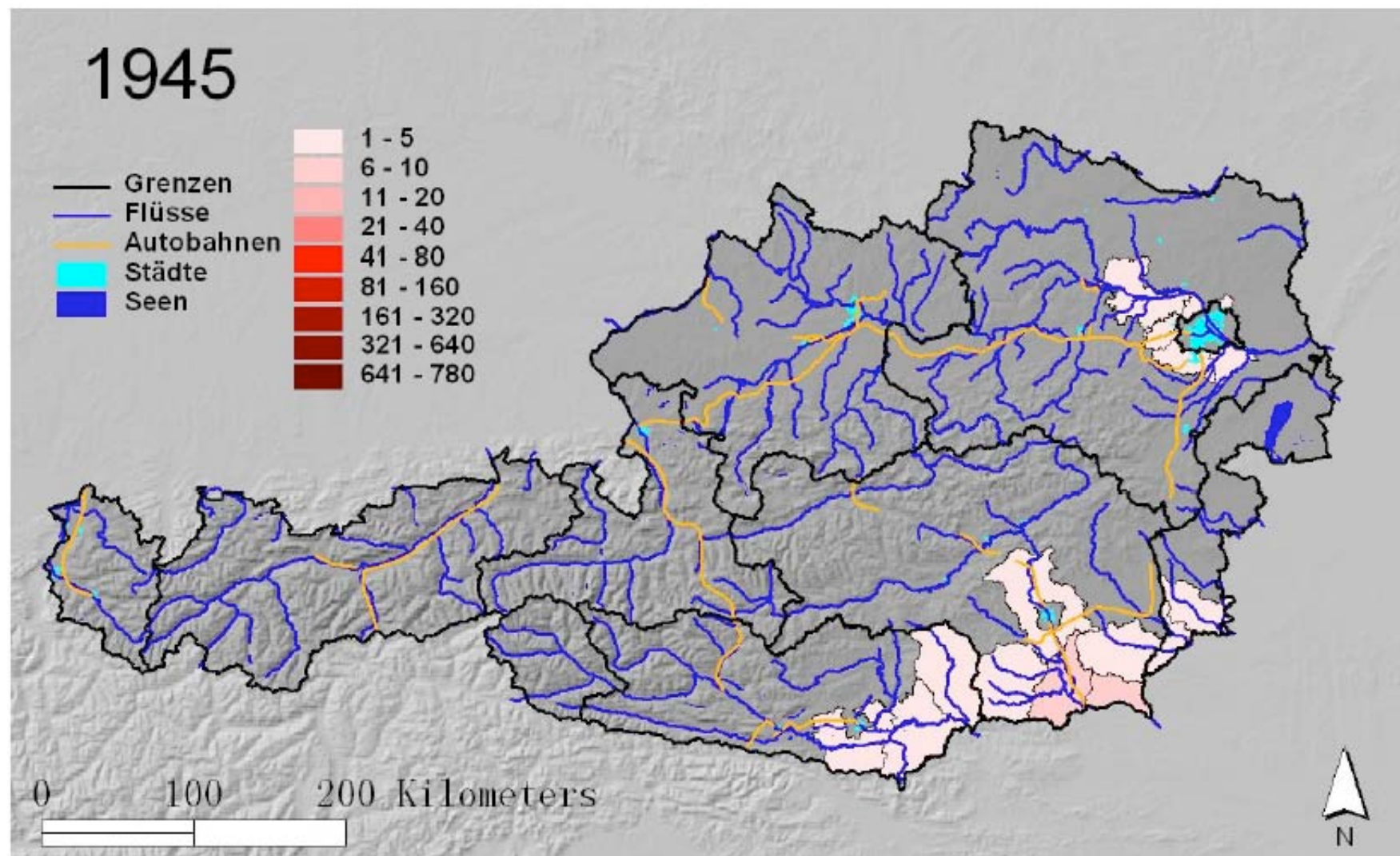
Georeferenced rabies cases and vaccination areas

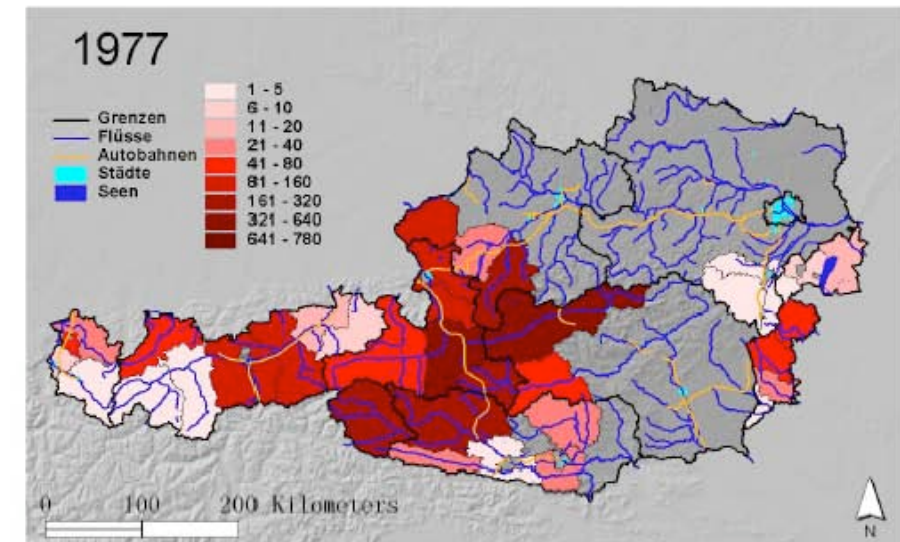
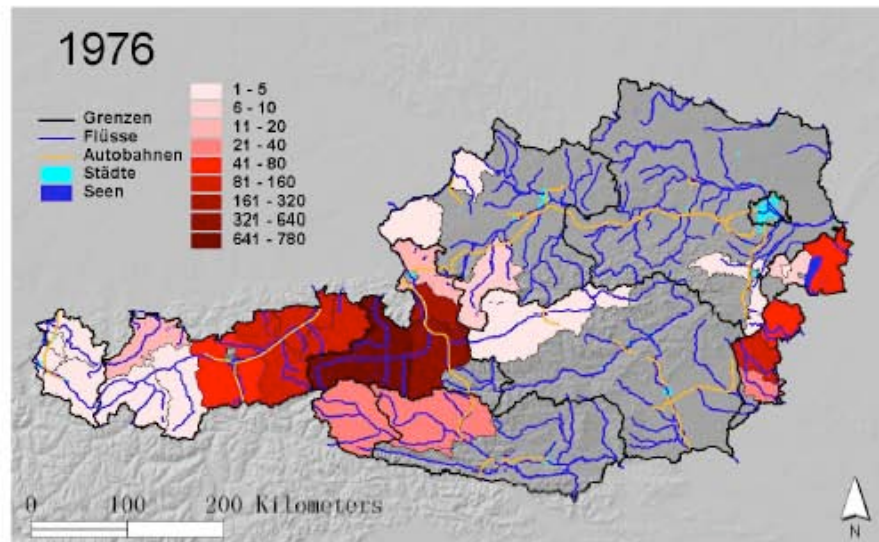
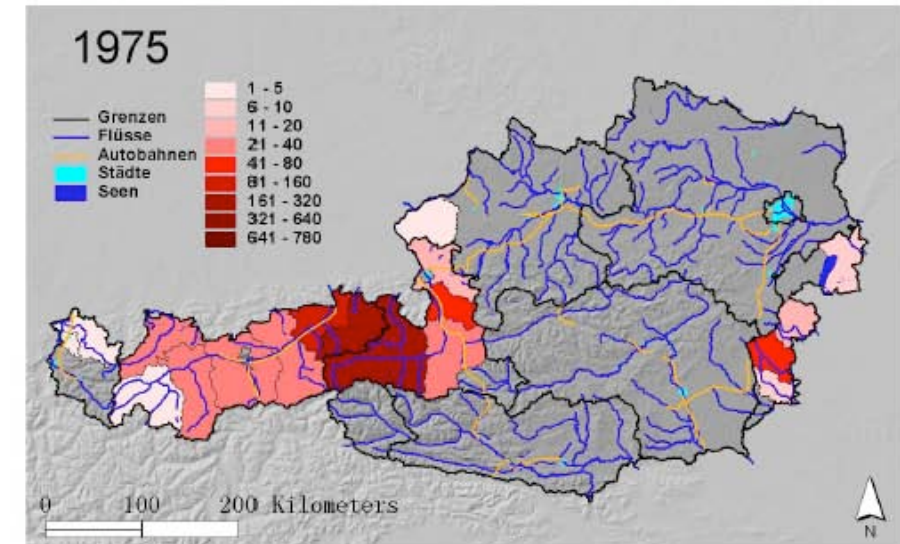
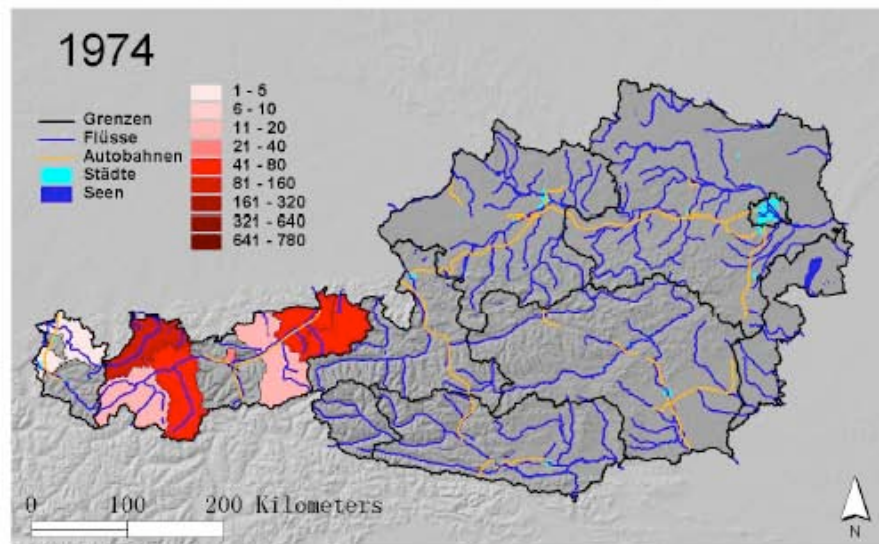
Georeferenced data have been compiled using a simple text editor. The point data files comprise location name, geographic longitude and latitude (from cities file of Bundesamt für Eich- und Vermessungswesen), altitude, number of cases and species. The polygon files contain township identification (ID) and yes/no information on vaccination.

Name	Longitude	Latitude	Alt	Cas	Spe
APETLON	16.83167	47.74417	120	1	101
FURTH	16.09278	48.50444	224	6	101
FURTH	16.09278	48.50444	224	1	180
HERNSTEIN	16.10917	47.89472	440	4	101
NEUHAUS	16.04944	47.99611	430	2	101
POTTENSTEIN	16.09722	47.95917	320	2	101
SEIBERSDORF	16.52056	47.95861	190	1	101
WEISSENBAACH	16.22389	48.08194	310	5	101
SOMMEREIN	16.65750	47.99194	197	2	101
ECKARTSAU	16.79861	48.14556	147	1	101
HOHENRUPPERSDO	16.65361	48.46444	218	1	111
HOLLABRUNN	16.08111	48.56194	282	1	101

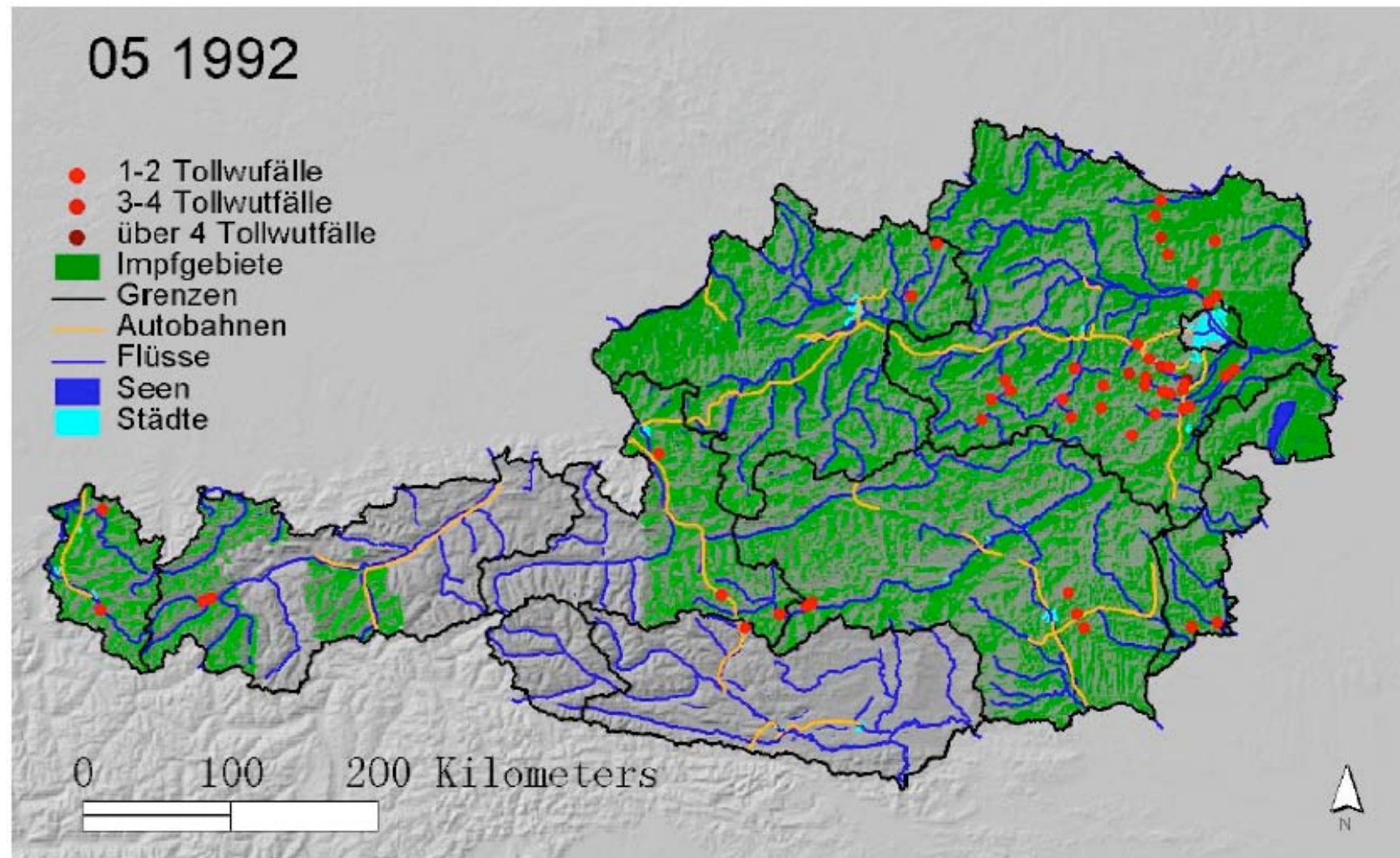
Township ID	Vac
10101	I
10201	I
10301	I
10302	I
10303	I
10304	
10305	I
10306	I
10307	I
10308	
10309	I
10310	I

Example of GIS visualisation - number of rabies cases 1945

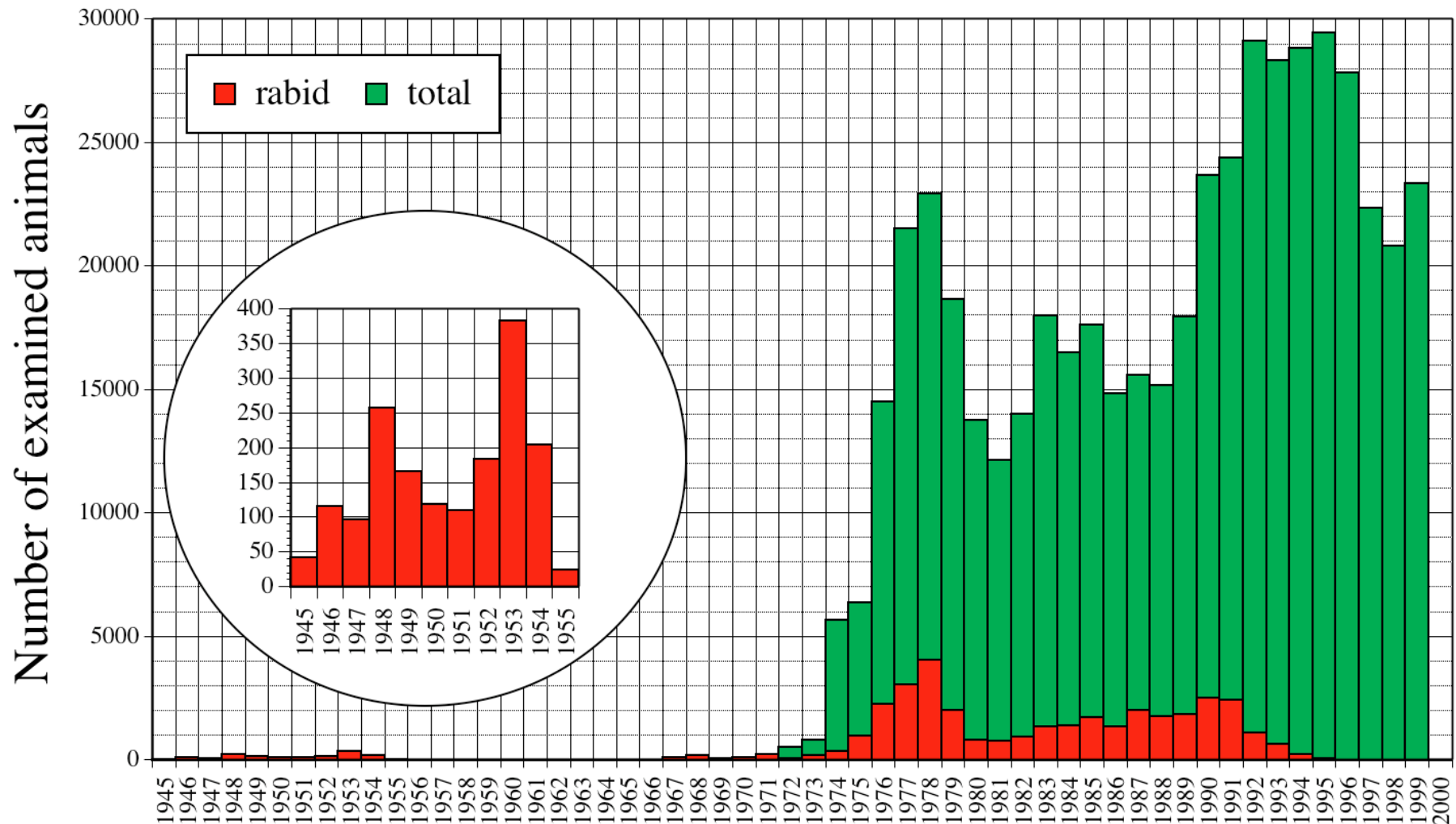




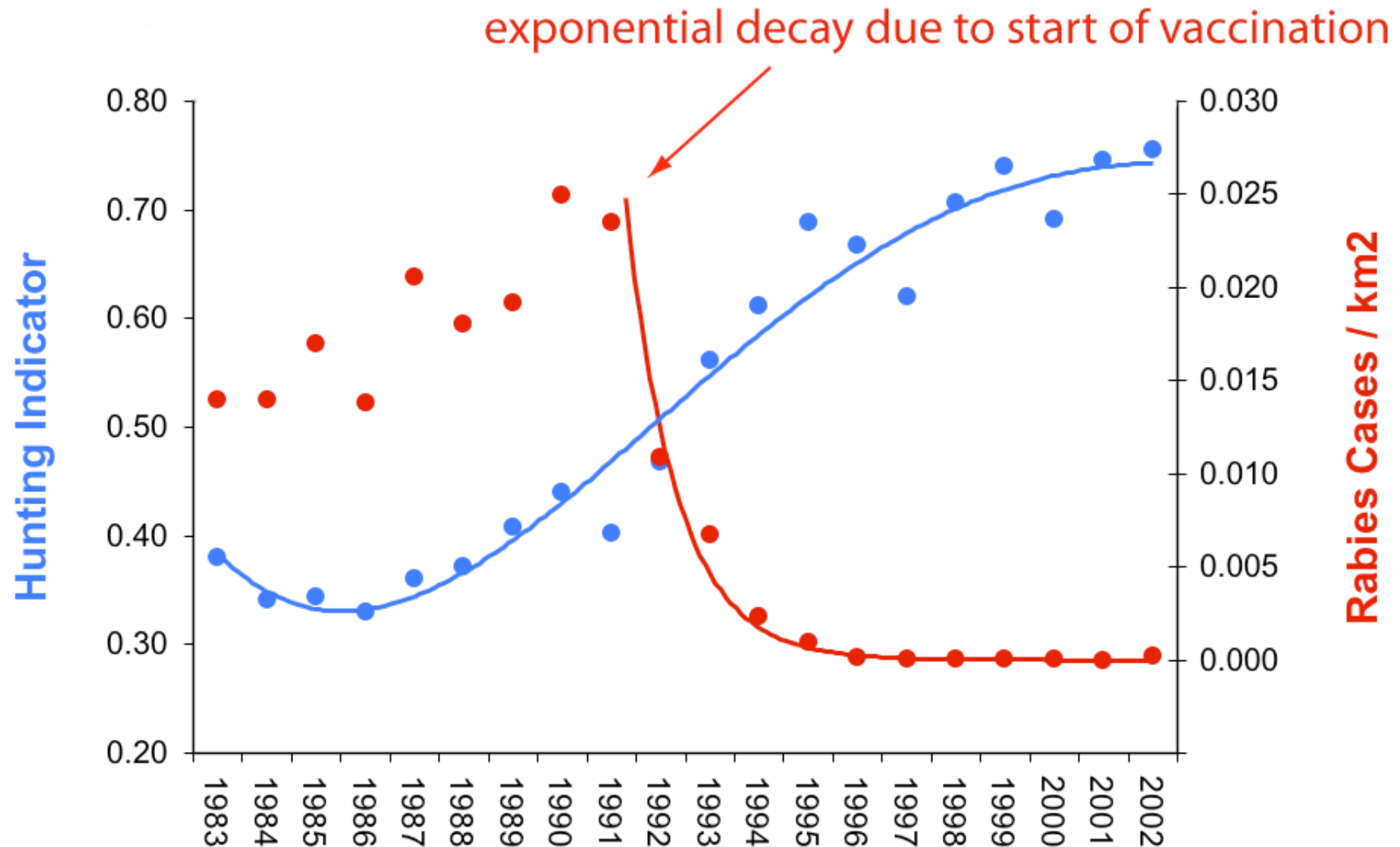
GIS visualisation - rabies cases and vaccination areas (green)



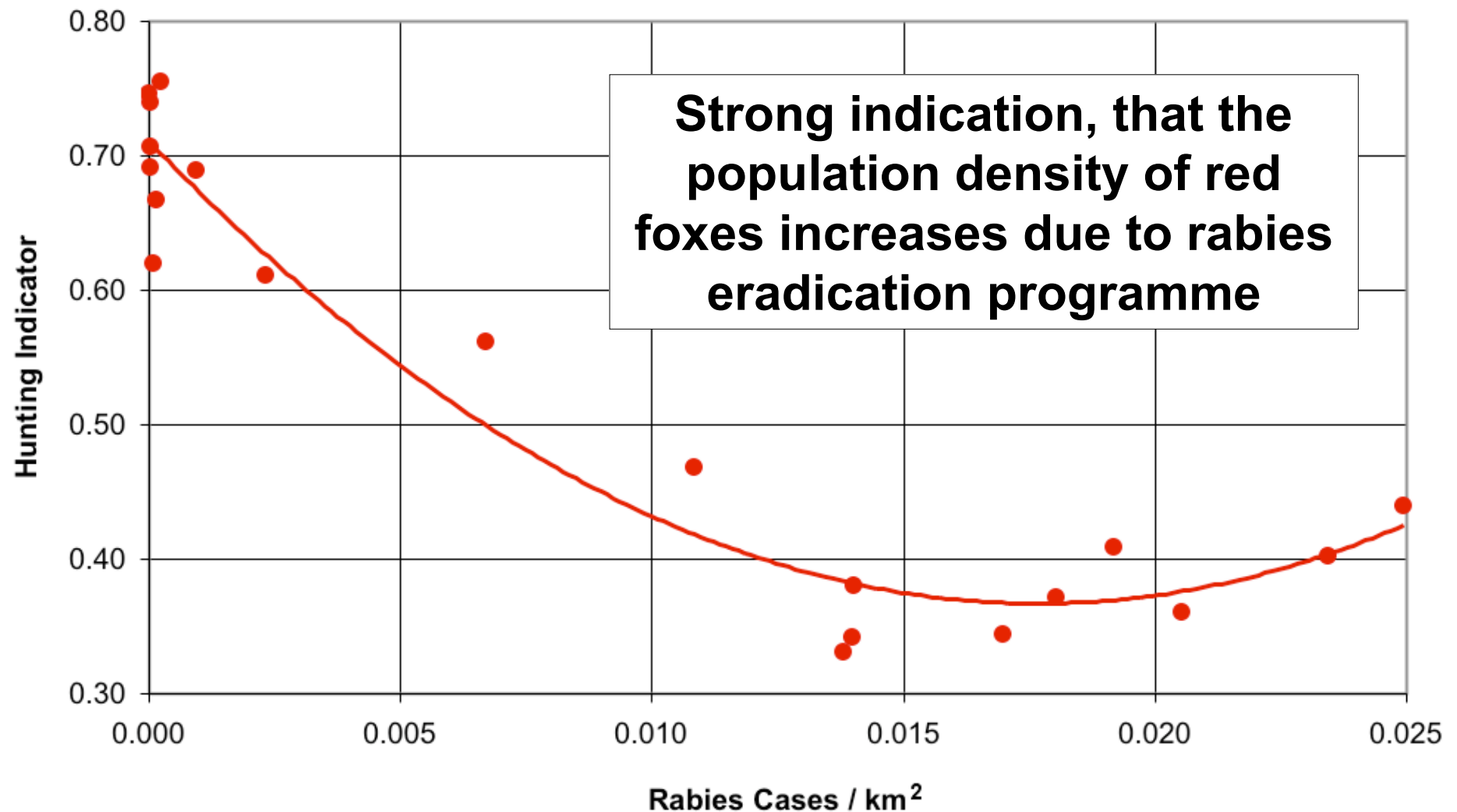
Time series of examined animals (green) and rabies cases (red)



Time series of hunting index and rabies cases in Austria



Rabies in Red Foxes vs. Hunting Indicator

 $R^2 = 0.94$ 

Results

- Georeferenced rabies data, visualised with ArcView GIS
period 1945 - present
resolution: annual/districts
- Georeferenced rabies data, visualised with ArcView GIS
period 1989 - present
resolution: monthly/points
- Preliminary results by a descriptive approach
Bruckmüller, A., 2004: Documentation of rabies in Austria 1945-2003
(in German), Doctoral Thesis, VUW, submitted.

Outlook

- Further investigations by applying inductive statistics and spatiotemporal epidemic models are in progress.