

# RESULTS

The outcomes of the project are an up-to-date knowledge base about regional lightning hazard as well as associated risks such as thunderstorms and hail. The spatially detailed results enable spatial planners to include lightning risk in regional planning strategies, site planning and prevention activities. Furthermore, the risk evaluation for particularly vulnerable infrastructures and facilities (e.g. wind power plants) can be enhanced. In addition with the project-associated raise of public awareness (lightning safety rules) this contributes to the prevention of lightning damages and to the civil security:

- Preparation of protection principles for persons, buildings and energy supply
- Development of procedures for the estimation of lightning strike densities for large-scale analyses and map visualisations

- Indicators for coherences between lightning activity and topography, climate/weather, settlement structures and damages in order to explain spatial patterns by using geographic information systems
- Maps indicating regional lightning hazards, interactive map service
- Model for the simulation of the effects of lightning flashes on the electricity network and for the estimation of damage costs, Prototype for the assessment of facility-based lightning danger for large areas
- Indicators for people's knowledge concerning the thunderstorm and safety rules in order to plan activities for raising awareness
- Promotion of cross-border knowledge transfer, collaboration and public relation activities (information event regarding lightning protection)

## FURTHER INFORMATION

[www.reblaus-interreg.eu](http://www.reblaus-interreg.eu)

# REGIONAL ANALYSIS OF LIGHTNING ACTIVITY

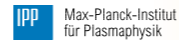
## PROJECT PARTNERS



Research Studios Austria Forschungsgesellschaft mbH, Studio iSPACE, researchstudio for geo-referenced media and technologies (lead partner)  
[www.ispace.researchstudio.at](http://www.ispace.researchstudio.at)



Austrian Electrotechnical Association (ÖVE), dept. ALDIS (Austrian Lightning Detection and Information System)  
[www.ove.at](http://www.ove.at) | [www.aldis.at](http://www.aldis.at)



Max-Planck-Institut für Plasmaphysik (IPP), Project Energy and System Studies  
[www.ipp.mpg.de](http://www.ipp.mpg.de)

## FUNDING PARTNERS

Austrian Insurance Association (VVO)  
[www.vvo.at](http://www.vvo.at)

Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMLFUW), dept. V/4 air pollution control and climate protection  
[www.lebensministerium.at](http://www.lebensministerium.at)

Bavarian State Ministry of the Environment and Public Health (StMUG), dept. 76: plant safety and incident prevention, energy efficiency  
[www.stmug.bayern.de](http://www.stmug.bayern.de)

City of Salzburg, dept. 5 spatial planning and building authority  
[www.stadt-salzburg.at](http://www.stadt-salzburg.at)



## SUPPORTER

Government office of Land Salzburg, dept. 7: spatial planning, dept. 16: environmental protection  
[www.salzburg.gv.at](http://www.salzburg.gv.at)



EuRegio Salzburg - Berchtesgadener Land - Traunstein  
[www.euregio-salzburg.eu](http://www.euregio-salzburg.eu)

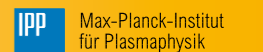
## PROJECT MANAGEMENT AND CONTACT

Thomas Prinz, Wolfgang Spitzer  
Research Studios Austria Forschungsgesellschaft mbH, Studio iSPACE, researchstudio for geo-referenced media and technologies  
Schillerstraße 25, 5020 Salzburg, Austria  
[office.ispace@researchstudio.at](mailto:office.ispace@researchstudio.at)  
[www.ispace.researchstudio.at](http://www.ispace.researchstudio.at)



# REGIONAL ANALYSIS OF LIGHTNING ACTIVITY

Cross-border nature risk management by regional analysis of lightning activity

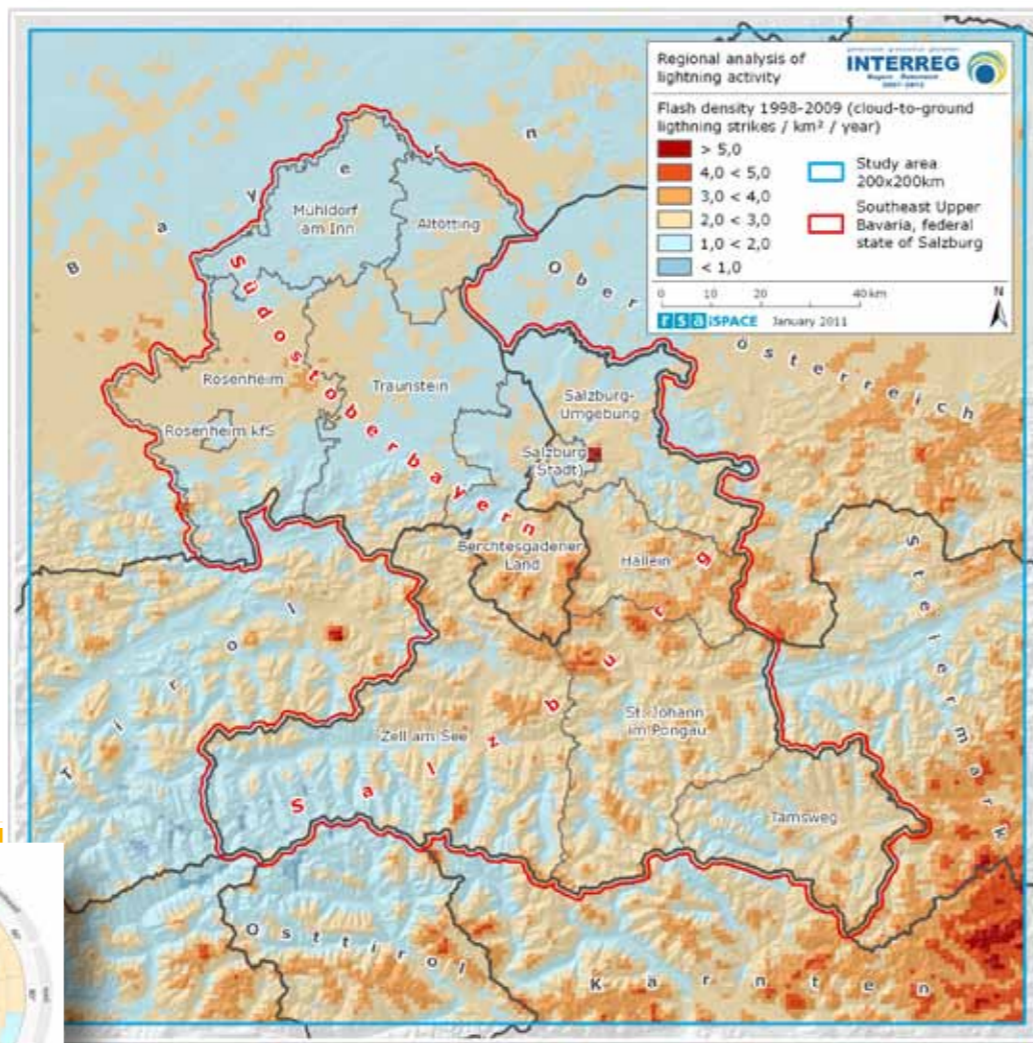


# REGIONAL ANALYSIS OF LIGHTNING ACTIVITY

Cross-border nature risk management by regional analysis of lightning activity

## INITIAL SITUATION

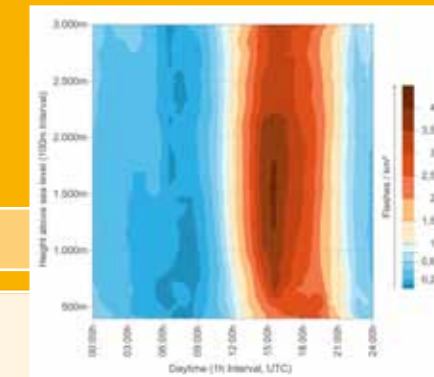
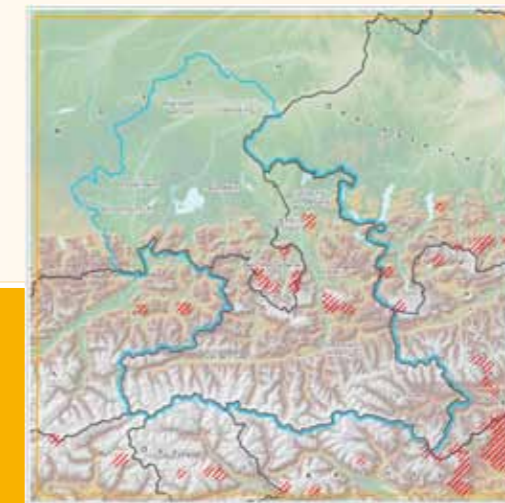
A lightning discharge is a fascinating but also frightening phenomenon. Within the region Southeast Upper Bavaria and the federal state of Salzburg between ten and fifty thousand cloud-to-ground lightning strikes per year are detected, resulting in an annual long-time average of two lightning strikes per square kilometer. Therefore the amount of damages caused by lightning is correspondingly high: Experts estimate damages to electrical devices in Austria to a multi-digit million euro range (fire and personal injury still not included). And the trend is rising. With regard to the climate change driven increase in extreme events, damage risks for infrastructure, buildings and supply security are even rising. For this reason decision-making material is necessary to support risk management and regional planning strategies. Research is particularly needed for generating large-scale knowledge for spatial planning and prevention strategies:



Are there coherences between lightning activity and topography, land use or climate conditions? How great is the exposure of current and future settlement areas to lightning hazard? How to make the public aware of thunderstorm and lightning risks? The EC-funded Interreg IV A project “Regional Analysis of Lightning Activity” addresses these important topics within the study area covering the federal state of Salzburg (Austria) and the region Southeast Upper Bavaria (Germany). This pilot project provides an integrative and GIS-based risk management approach, interrelating natural hazard management, prevention, spatial planning, alpine topography and infrastructure. The results developed in an international cooperation are scientific findings as well as applied regional decision support for public administration, risk management, prevention, spatial and site planning, civil protection, insurance activities and citizens.

## PROJECT OBJECTIVES

The major aim of the project is the development of a prototypical cross-border approach, which combines different data sources, domains and information systems, for an integrative analysis of lightning hazard. This is realized by the first-time analysis of about one million cloud-to-ground lightning strikes detected between 1998 and 2009 in the study area (200 x 200 km) in cooperation with regional experts as well as national and international authorities:



- Integrative pilot approach for handling cross-border risk and natural hazards
- Combination of various risk-relevant topics and players (risk management, prevention, spatial planning, site planning, alpine topography and infrastructure)
- Development and supply of innovative cross-border data, visualisation and analysis systems regarding lightning hazard (hazard zoning, risk modelling, spatial indicators)
- Improvement of hazard prevention by means of cross-border cooperation and public relation activities

