

## Workshop / Delavnica:

“Evoluzione recente del clima tra Italia settentrionale e Slovenia” / “Značilnosti in trendi podnebja v Severni Italiji in Sloveniji ”

Informacije ARSO o vplivu vremena, podnebja in kakovosti zraka na ljudi

Informazioni ARSO sull'impatto del tempo, clima e la qualità dell'aria sulla salute

TANJA CEGNAR

ARSO

Sala consiglio comunale - Municipio di Gorizia - 27. 6. 2014



2007-2013

cooperazione territoriale europea  
programma per la cooperazione  
transfrontaliera

Italia-Slovenia

evropsko teritorialno sodelovanje  
program čezmejnega sodelovanja

Slovenija-Italija



Investiamo nel  
vostro futuro!

Naložba v vašo  
prihodnost!

[www.ita-slo.eu](http://www.ita-slo.eu)

Progetto cofinanziato dal Fondo europeo di  
sviluppo regionale

Projekt sofinancira Evropski sklad  
za regionalni razvoj

# Information about weather and climate impact on human health and wellbeing

Slovenian Environment Agency, Meteorological Office  
Tanja Cegnar

Is our information enough detailed and up to date to fulfil demand?

How to convey information in the most efficient way?

How to reach targeted groups?

Tailor information to the end users needs

Integrate information

Rising awareness, education and promotion

Stakeholders prefer simple measures and indices, ready to be applied

Example (like UV index and the shadow rule)

## Biometeorological information provided on daily basis:

UV index

Pollen concentration

Bioweather forecast

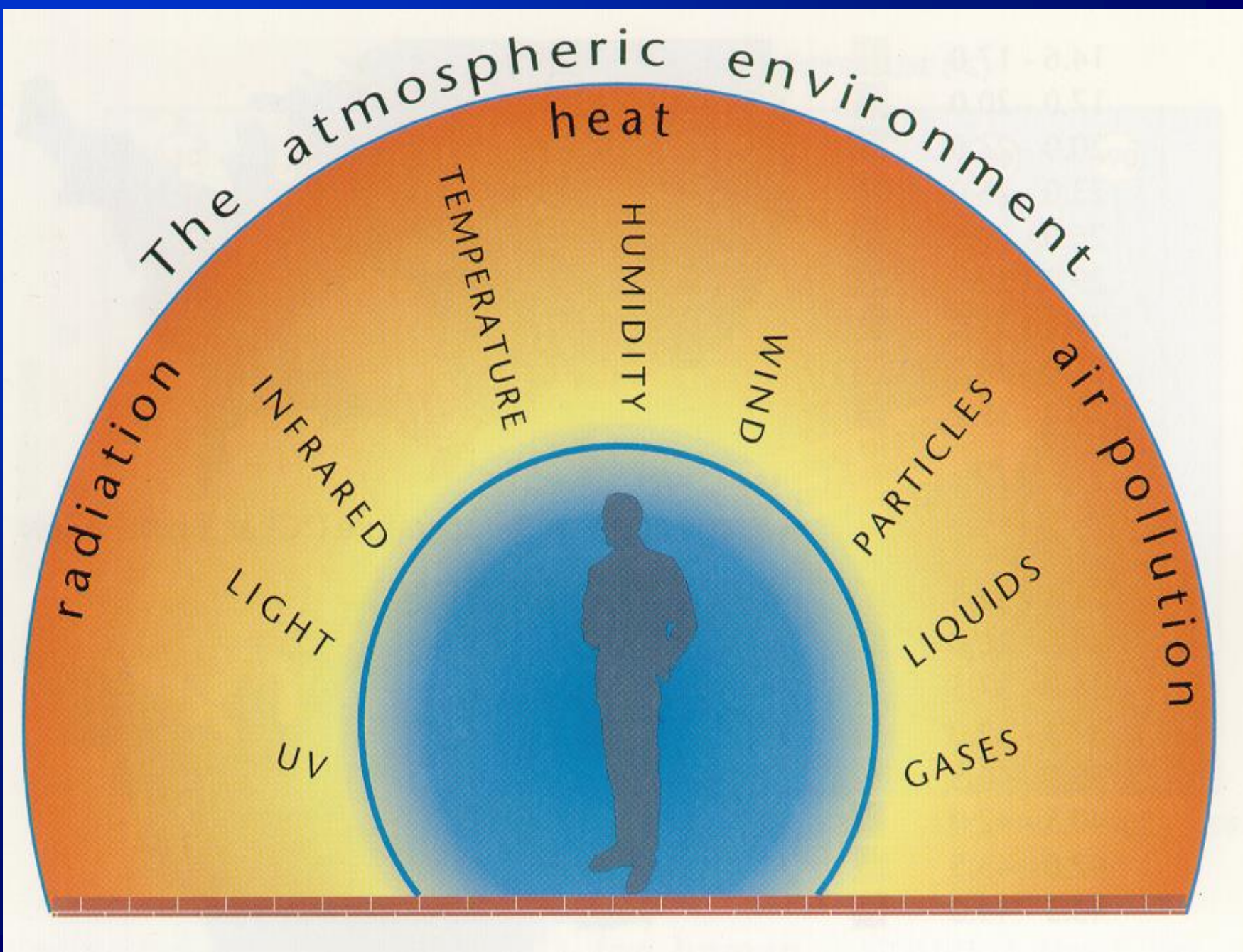
Air pollution (monitoring & forecast)

## Occasionally:

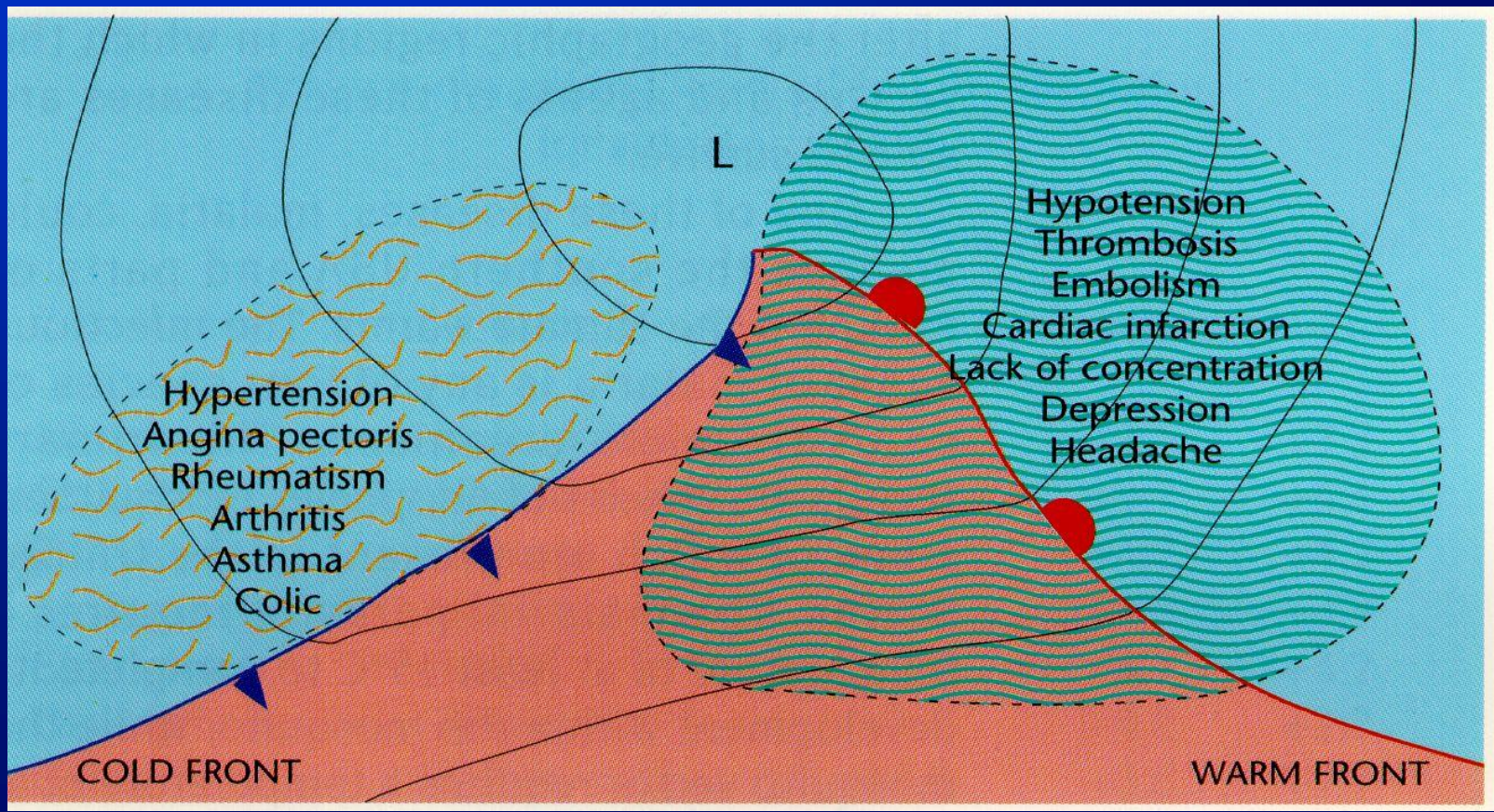
Bioclimate information for tourism and health resorts

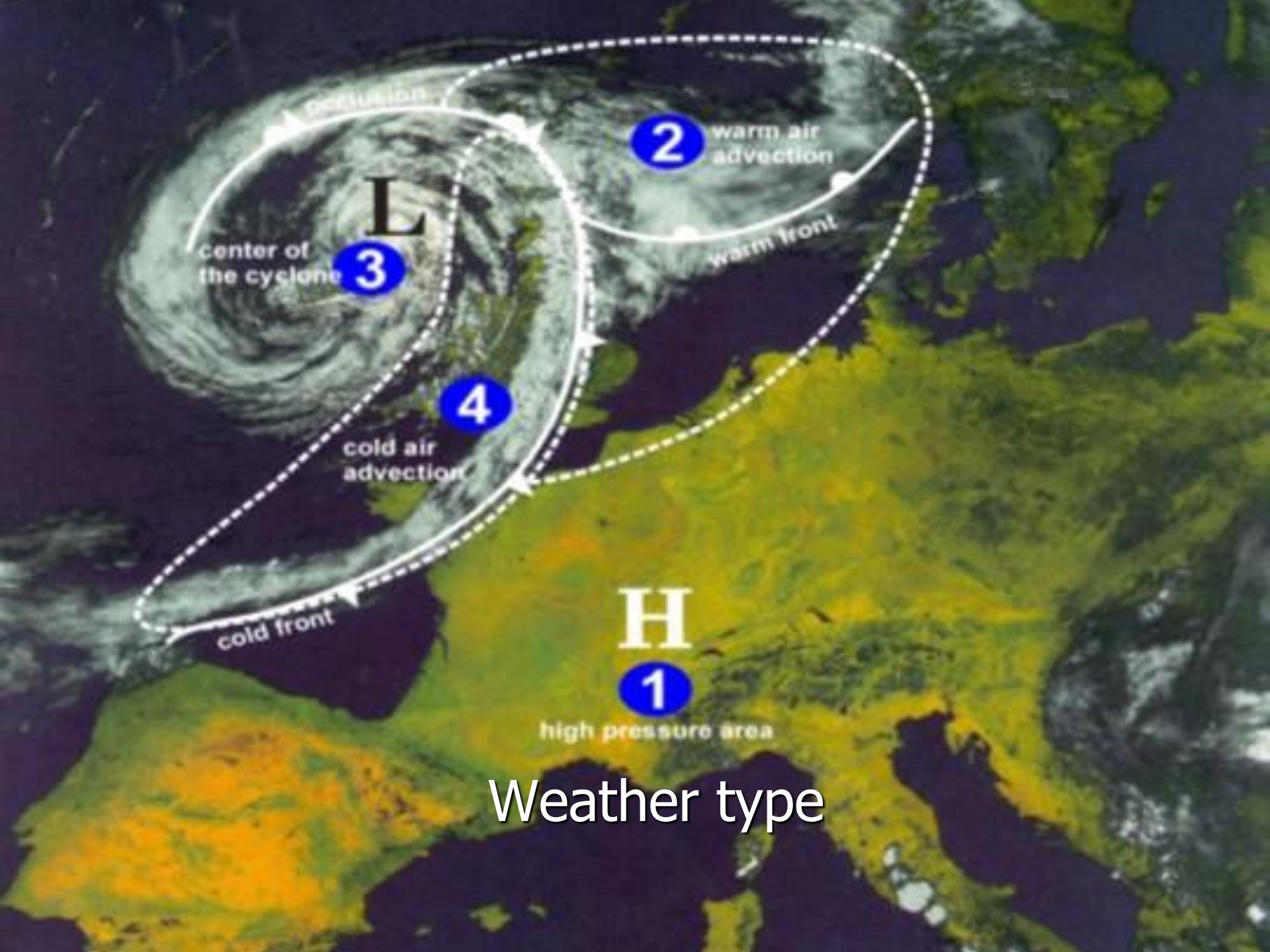
Warnings

Information for infrastructure planning



# Bioweather forecast





**L**  
center of the cyclone  
**3**

**2** warm air advection

warm front

**4**

cold air advection

cold front

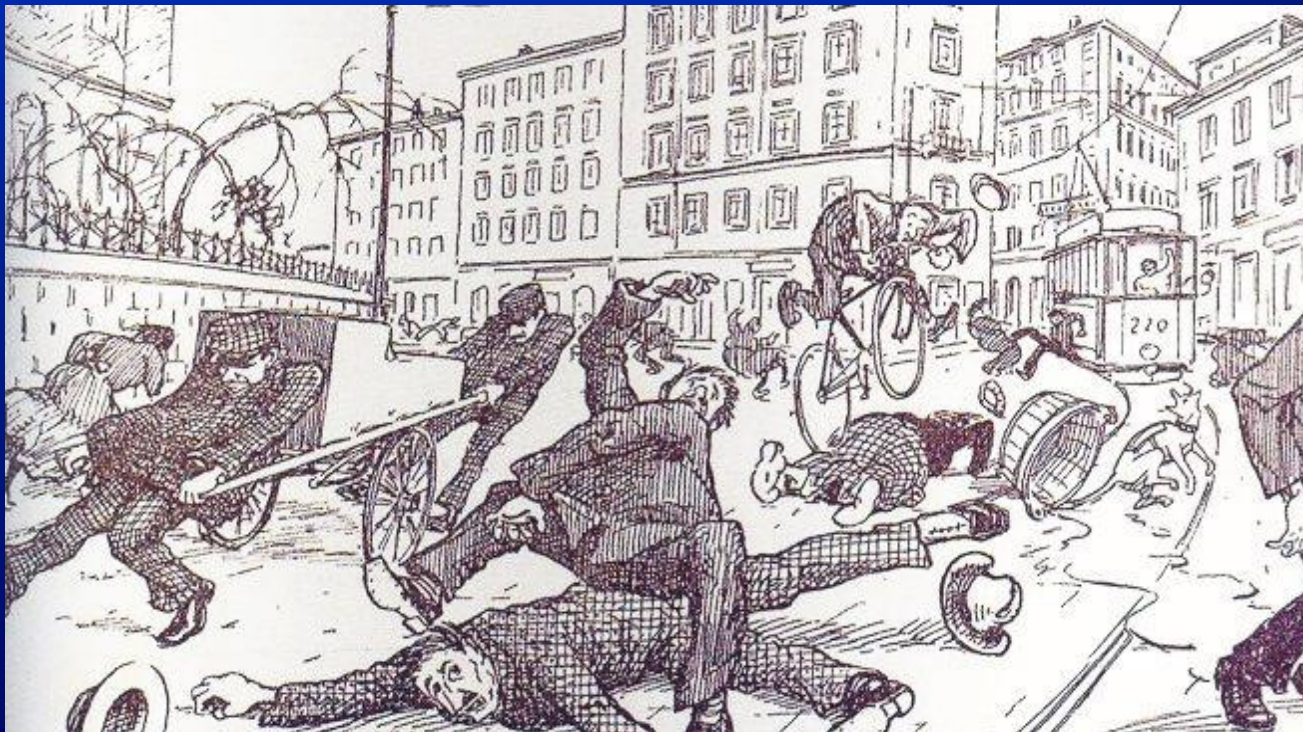
**H**

**1**

high pressure area

Weather type

# Weather impacts on health





# Oppressive conditions



A photograph of an industrial facility, likely a power plant or refinery, during sunset. The sky is a mix of orange, yellow, and dark grey, with thick, billowing white and grey smoke rising from several tall, dark smokestacks. The industrial structures are silhouetted against the bright sky, with some lights visible on the buildings.

# Air pollution

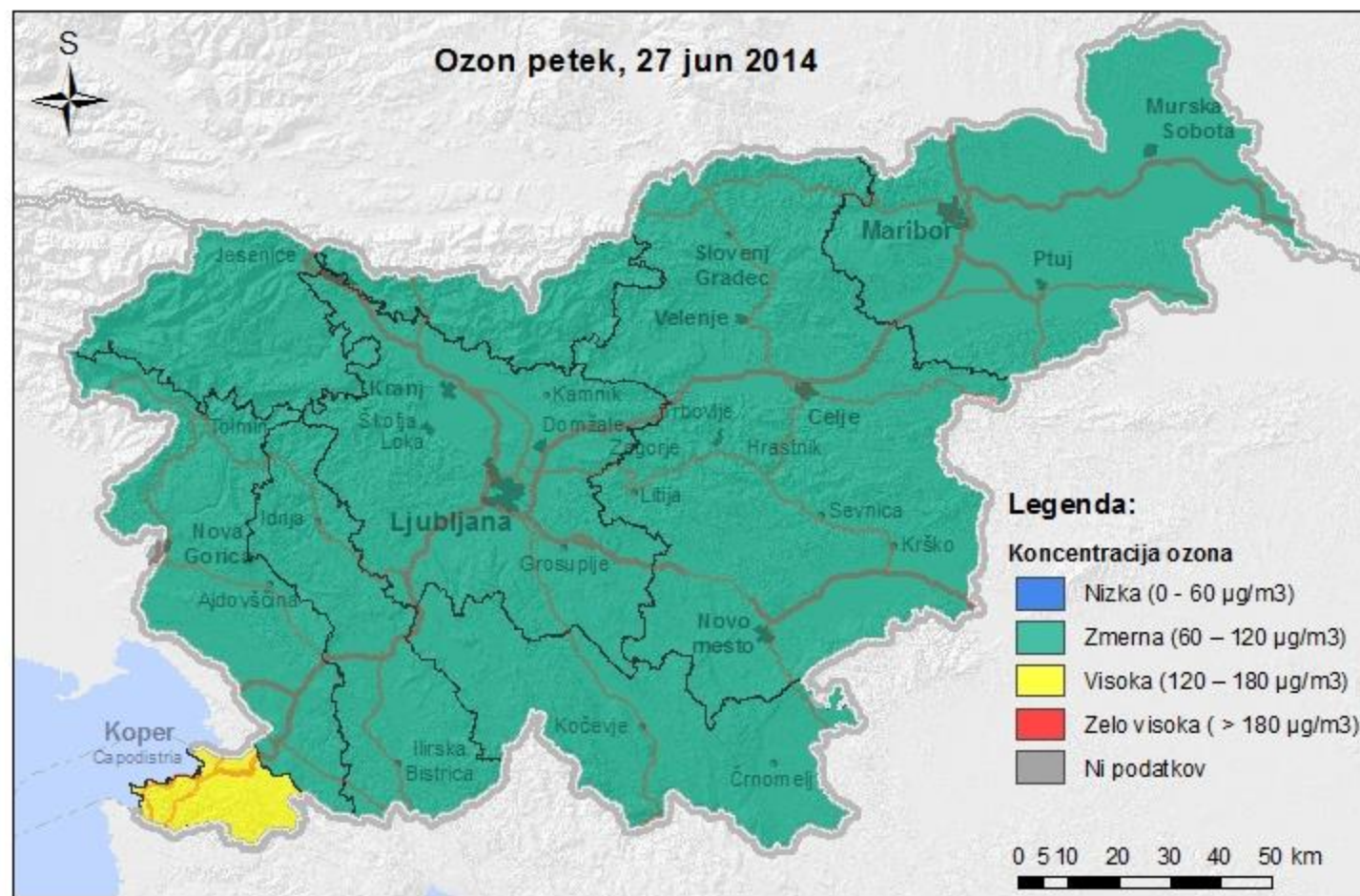
emissions

air movement

chemistry

deposition

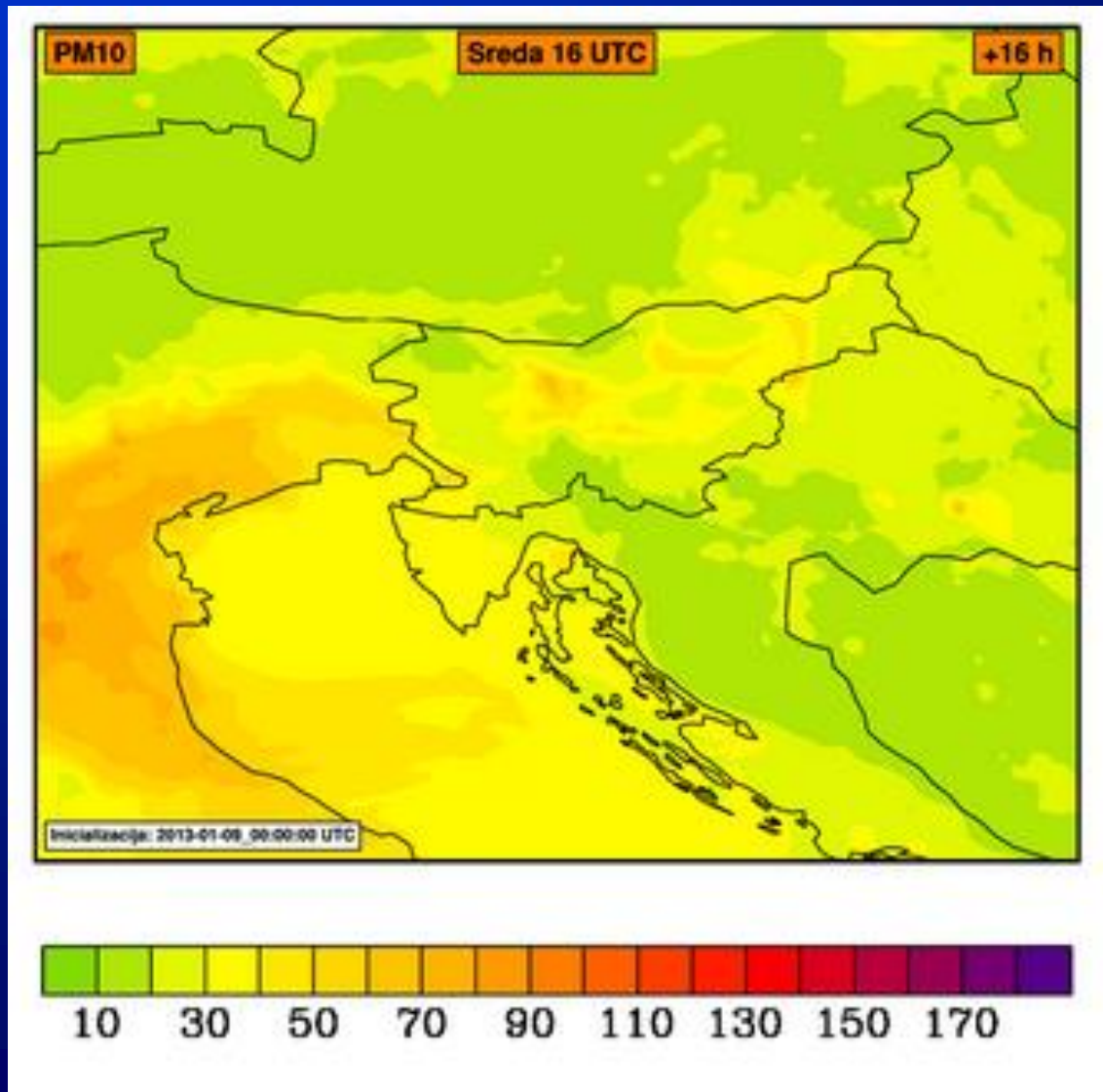
# Ozone forecasts



OPOMBA: Državna meja Republike Slovenije z Republiko Hrvaško je meja območij, za katera je Republika Slovenija vodila zemljiški kataster in register prostorskih enot na dan 25. junija 1991.  
Vir: Geodetska uprava Republike Slovenije.

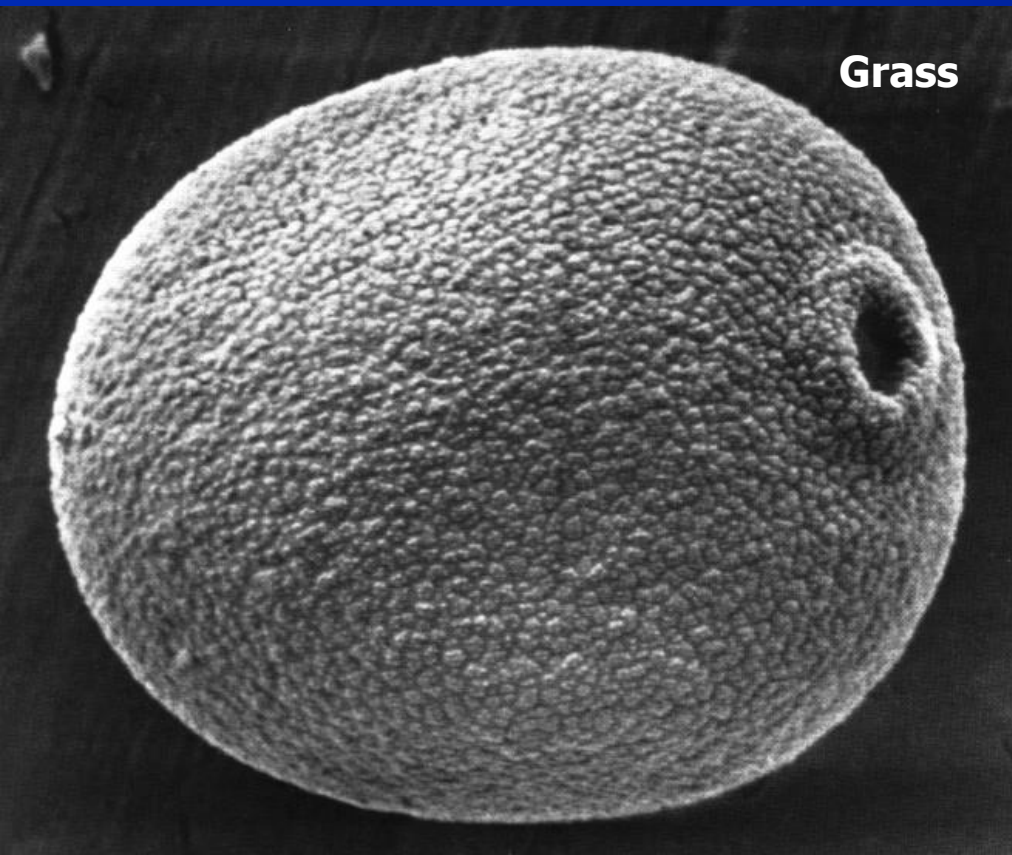
Vir: ARSO, GURS, DRSC  
Leto: 2014

# PM10 level forecast

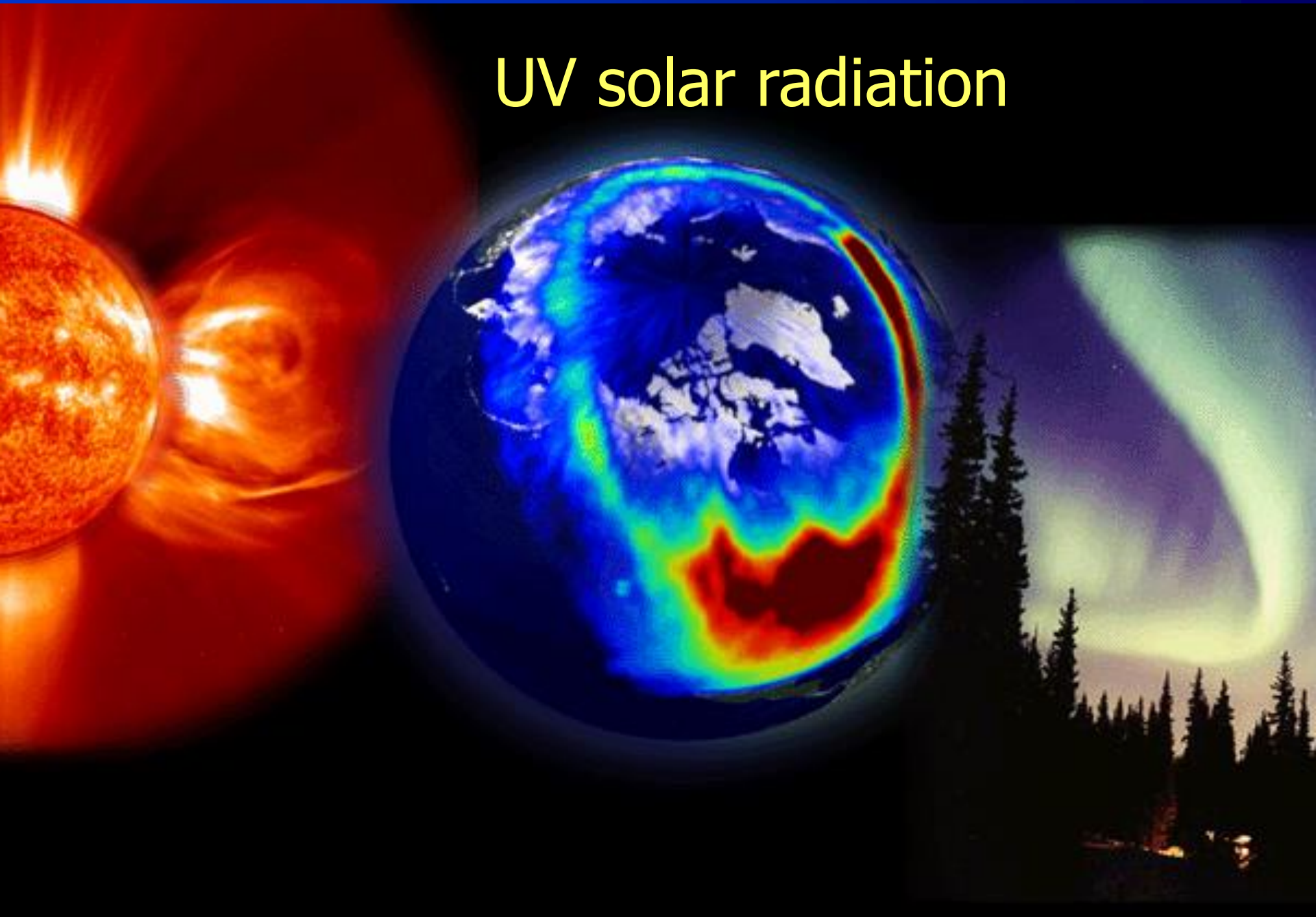


Source:  
FMF

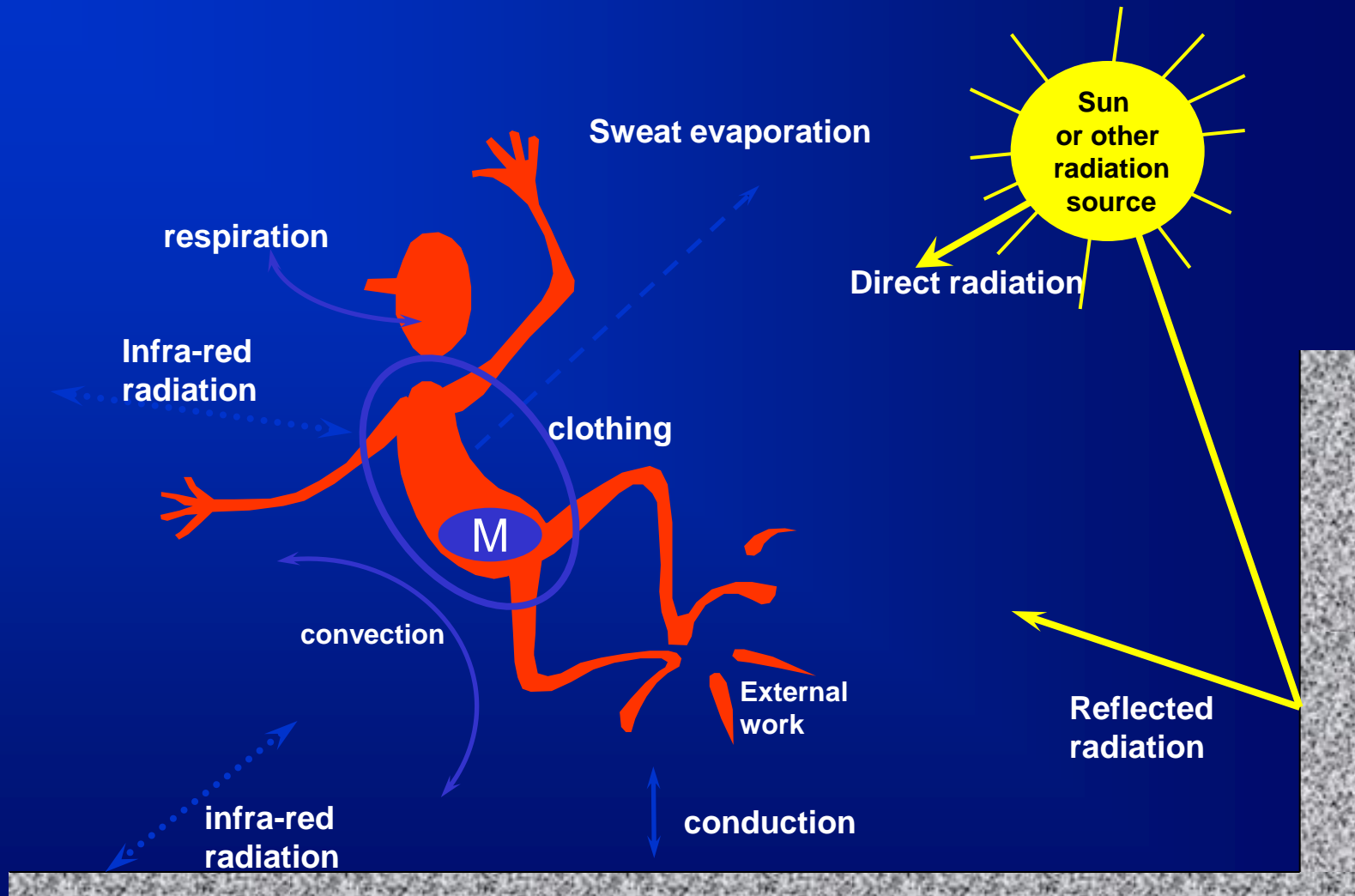
Weather and climate have a considerable influence on asthma, hay fever and other respiratory disorders caused by various allergens, pollens and pollutants



# UV solar radiation



# Avenues of Heat Exchange



Heat waves present special problems in urban areas because of the retention of heat by buildings, if ventilation for cooling at night is inadequate



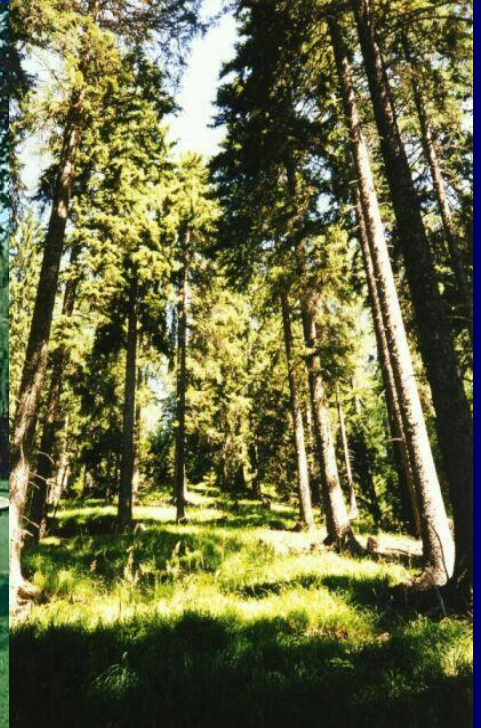
Early behavioural signs of prolonged heat stress in densely populated areas include: discomfort, social intolerance, irritability, industrial accidents



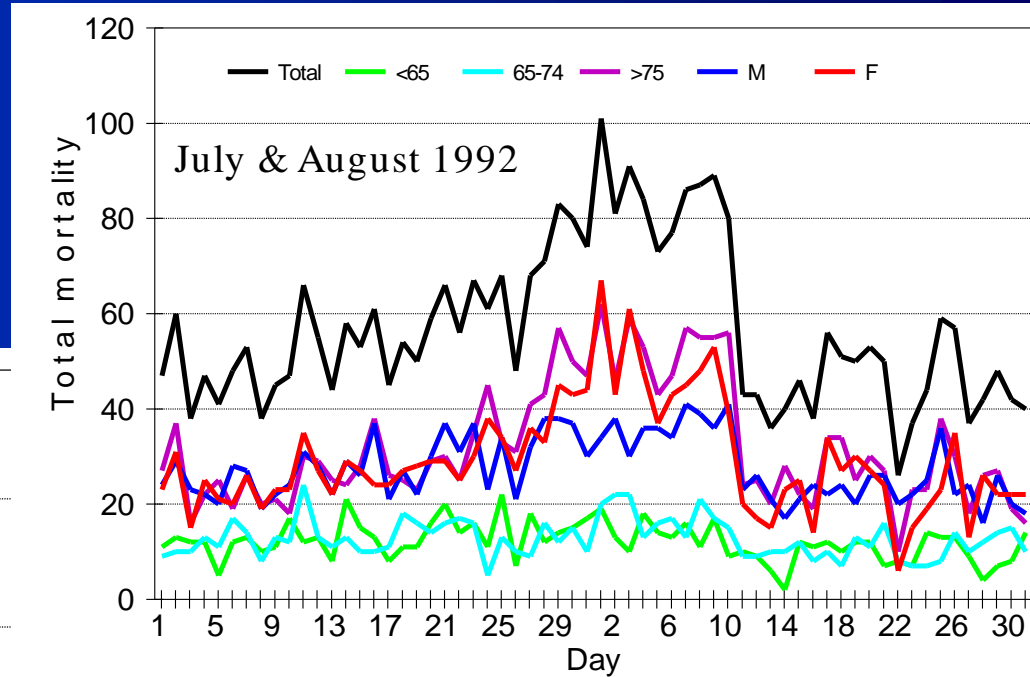
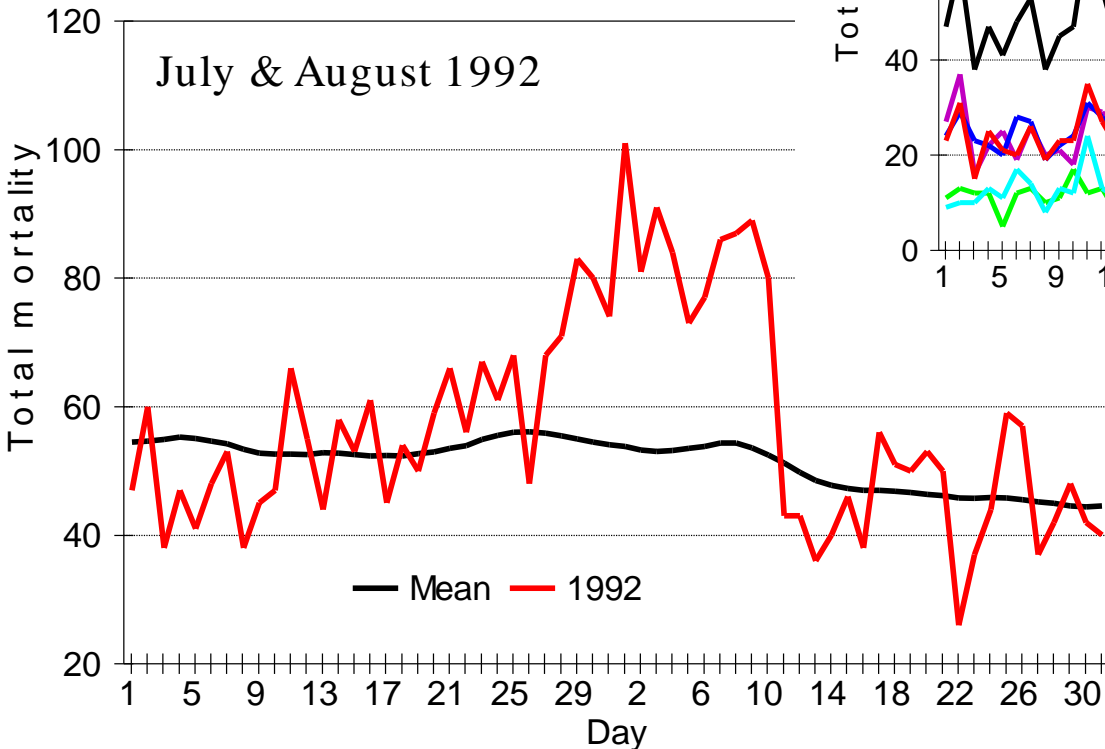
Local change in land use → local climate →  
change in vulnerability and resilience



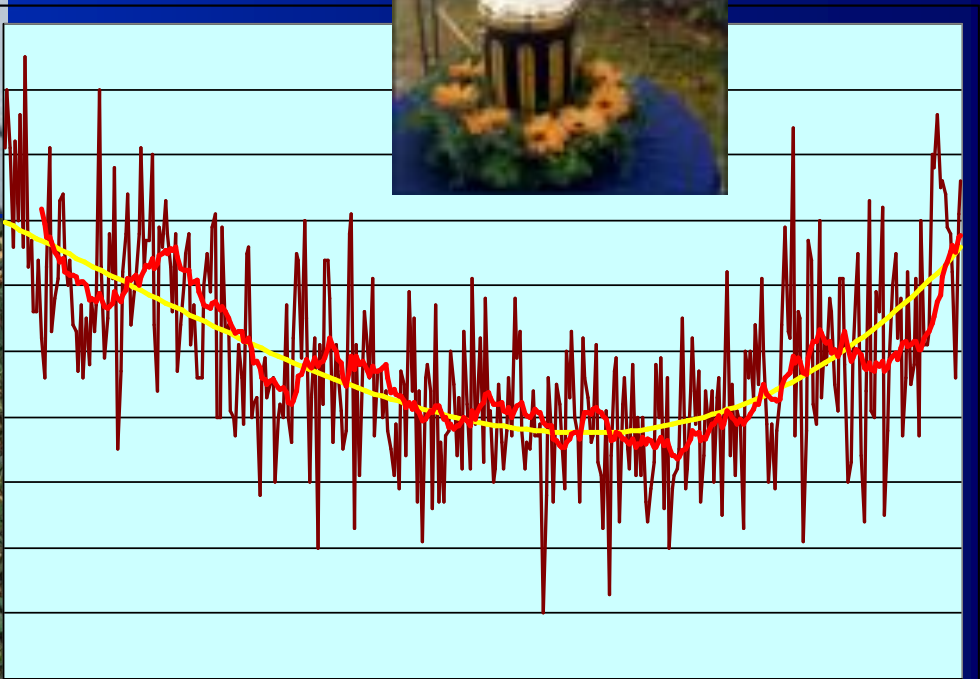
# Make the best use of knowledge - urban climatology!



# The most impressive heat wave in Rome beside the ones in 1983, 1994 and 2003

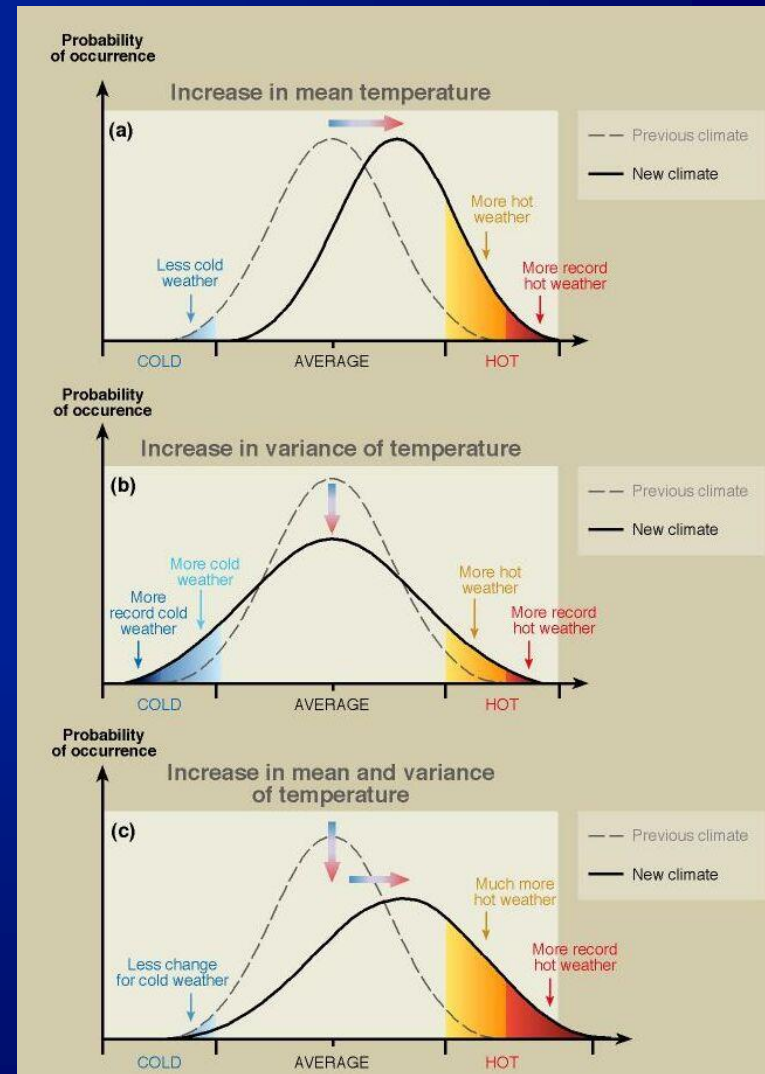


# Morbidity and mortality in related with climate and weather



# Think about future!

- Extremes are projected to get worse (IPCC)
- Extremes are expected to be more frequent (WMO)
- Higher maximum air temperatures and more hot days over nearly all land areas are very likely
- Reduced diurnal temperature range over most land areas



# Impacts (crucial: variability, extremes):

- Initial impact effects
- Expected adaptation
- Residual net impacts

## Depend on:

- Exposure to extreme events
- Adaptive capacity

Don't forget tourists, sportsmen, heat load in public transportation vehicles!



Climate and regional geographic environments are evolving  
These changes can create situations and conditions that  
favour or support new or different disease patterns  
Changes in the distribution of vectors or disease hosts





Climate : Weather

**Bioclimate:**  
maritime climate,  
**medium height and**  
mountains.

Stimuli

**Intensity**

Kind



Climatotherapy:  
terrain therapy  
rest in fresh air  
air baths  
heliotherapy



Climate is a resource

Travelling for health purposes

Marked seasonality and weather sensitivity



Environmental values,  
economic well-being and  
health are interdependent

Data on present meteorological conditions are becoming different with widely applied automatic weather stations  
Different kind of information from what we were used to in the past

Information gets its real value only being used, thus it has to be tailored up to the users needs



Climate change will shift vegetation belts higher; also, the region of permafrost will be slowly pushed upwards. This could have some impact on the landscape, fauna and consequently on the appeal of those tourist destinations. Generally, milder conditions, especially in the winter and shoulder months, could attract more people into the uplands for hill walking, creating opportunities and threats for agriculture and nature conservation.

Mountaineering may provide some partial compensation for reduced skiing opportunities, but there will be a greater risk of snow avalanches in the warmer conditions.



# Mountain climate/ weather

Mountain climate, and consequently weather, is particular. Could be quite different from what we experience in lowland.



Not only values, range, extremes, also combinations of single elements give significantly different perception (thermal) and have different impacts (sunburns).

Indices and combined measures for assessing the impact on human body are necessary.

Climate change may affect some traditionally summer or winter resorts.

**It may cause an extension or a reduction of the peak season.**

It may affect the offer and choice of recreation and sport activities available at the resorts.



More and more people are willing to spend at least part of their vacation in health resorts in order to cure chronic diseases or improve the general health condition.

Climate is even more important for health resorts claiming to offer healthy climate or climatotherapy.





Needs and desires to travel can be divided from the point of climate into:

- Home climate, people will like to spend some time in more pleasant climate or they will like to avoid oppressive weather conditions (for example heat waves)
- Travel with the purpose to enhance health in places with well-known healthy climate
- Searching for climate features, which enable selected recreation forms and sports



# Snow avalanches

Many avalanche problems arise from ignorance. With proper planning and precautions the avalanche threat can be reduced by an acceptable level of restriction on tourist activities.

There is an international scale, widely used.

Most of the accidents do not occur when danger is extremely high.

Where to find necessary information?

How to communicate uncertainty, probability, variability (in time and space)?



It is extremely important to give the population all the necessary information when the heat load will increase over the threshold and how to act.

The information should be clear; concrete recommendations and advice should be given, without inducing panics and should reach everybody in the city, also tourists and occasional visitors.



Identified more or less the existing threats that are present and expected to intensify

### **Heat waves**

Vector borne diseases recognized as problem, not only due to changing climate, but also due to globalization (tiger mosquitoes)

### **Impact on air and water quality**

Food quality (salmonella, impact of climate on food production, crop diseases, insects propagation)

Problems:

Research is not coordinated well with policy makers needs

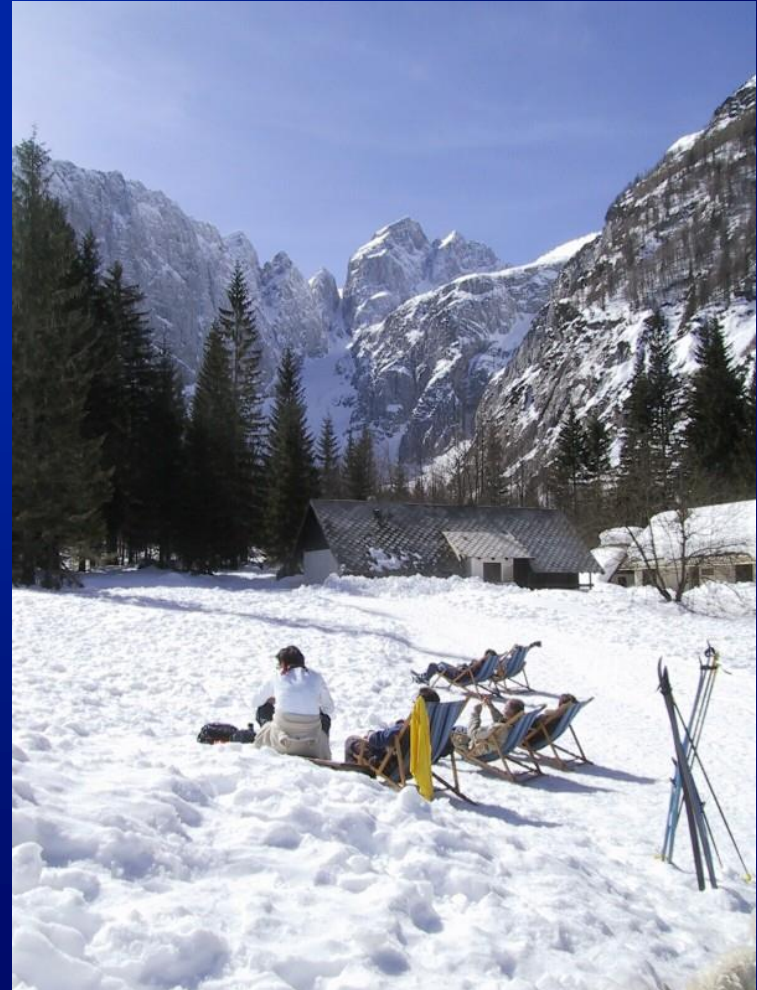
Research projects don't result in an easy understandable summary oriented towards the needs of policy makers

Cooperation between climatologists/meteorologists and health sector should be strengthened

Is our information enough detailed and up to date to fulfil demand?

How to reach and approach public/stakeholders in the most efficient way?

How to reach targeted groups (e.g. inexperienced, foreign tourists, decision-makers)?



Media are the most efficient way to reach the whole population



## Adaptation to climate change

Climate change is impacting human wellbeing and health directly and indirectly

Opportunity for biometeorology?





# “Evoluzione recente del clima tra Italia settentrionale e Slovenia” / “Značilnosti in trendi podnebja v Severni Italiji in Sloveniji ”

Informacije ARSO o vplivu vremena, podnebja in kakovosti zraka na ljudi

Informazioni ARSO sull'impatto del tempo, clima e la qualità dell'aria sulla salute

*Tanja Cegnar*

**Agencija RS za okolje**

*Progetto GEP finanziato nell'ambito del Programma per la Cooperazione Transfrontaliera Italia-Slovenia 2007-2013, dal Fondo europeo di sviluppo regionale e dai fondi nazionali.*

*Projekt GEP sofinanciran v okviru Programa čezmejnega sodelovanja Slovenija-Italija 2007-2013 iz sredstev Evropskega sklada za regionalni razvoj in nacionalnih sredstev*



Ministero dell'Economia  
e delle Finanze



REPUBLIKA SLOVENIJA  
SLUŽBA VLADE REPUBLIKE SLOVENIJE ZA RAZVOJ  
IN EVROPSKO KOHEZIJSKO POLITIKO



2007-2013

cooperazione territoriale europea  
programma per la cooperazione  
transfrontaliera

**Italia-Slovenia**

evropsko teritorialno sodelovanje  
program čezmejnega sodelovanja

**Slovenija-Italija**



**Investiamo nel  
vostro futuro!**

**Naložba v vašo  
prihodnost!**

**[www.ita-slo.eu](http://www.ita-slo.eu)**

Progetto cofinanziato dal Fondo europeo di  
sviluppo regionale

Projekt sofinancira Evropski sklad  
za regionalni razvoj