# COST-722

Short range forecasting methods of fog, visibility and low clouds

Phases of COST-722 2001-2007

- I Inventory
- 3 Working Groups
  - WG1 : "Initial data"
  - WG2 : "Models"
  - WG3 : "Statistical methods"
- II: Research and development
- III: Development and application
- IV: Dissemination
  - exchange of modules with documentation
  - issuing the final report

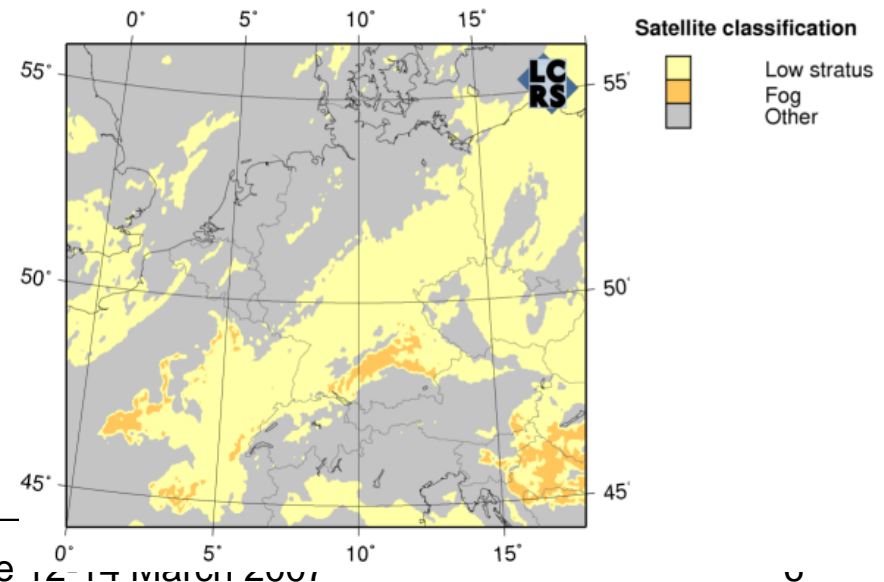# COST-722: 14 European members and Canada
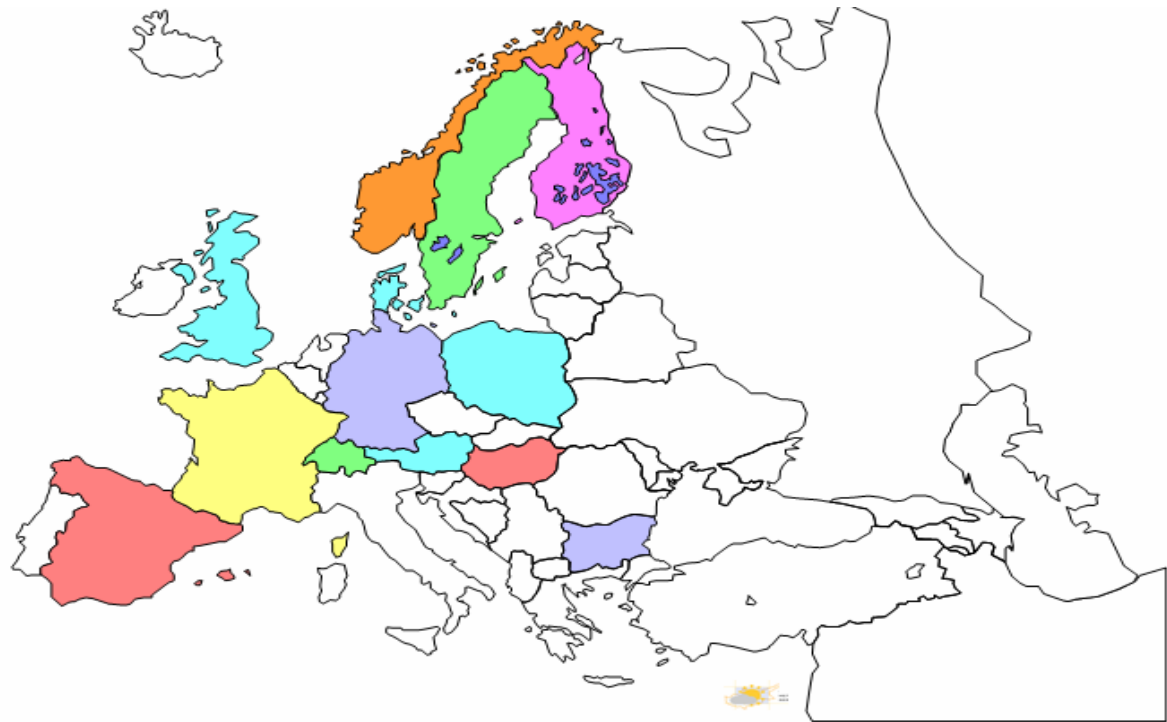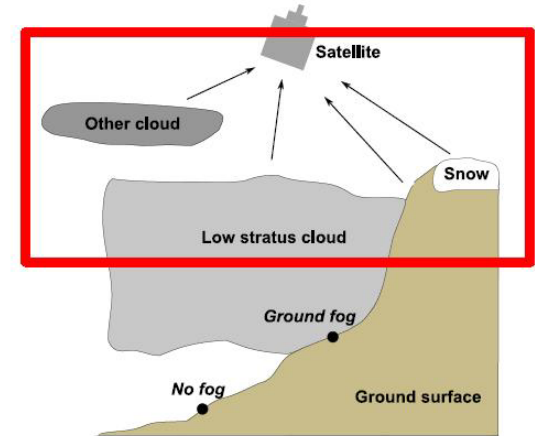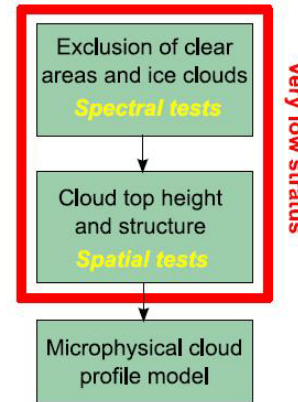
Working areas

- Working Group 1: Initial Data
- Working Group 2: Models
- Working Group 3: Statistical Methods

WG1: Initial data

- Satellite data for initializing models
- Combination of satellite and ground-based observations
- Fog climatologies
- Measurement techniques

WG1: Initial data

- **Satellite data for initializing models**
- Combination of satellite and ground-based observations
- Fog climatologies
- Measurement techniques

WG1: Initial data

- Satellite data for initializing models
- **Combination of satellite and ground-based observations**
- Fog climatologies
- Measurement techniques

sea without any cloud
low clouds above sea
risk not estimated
high level risk
medium level risk
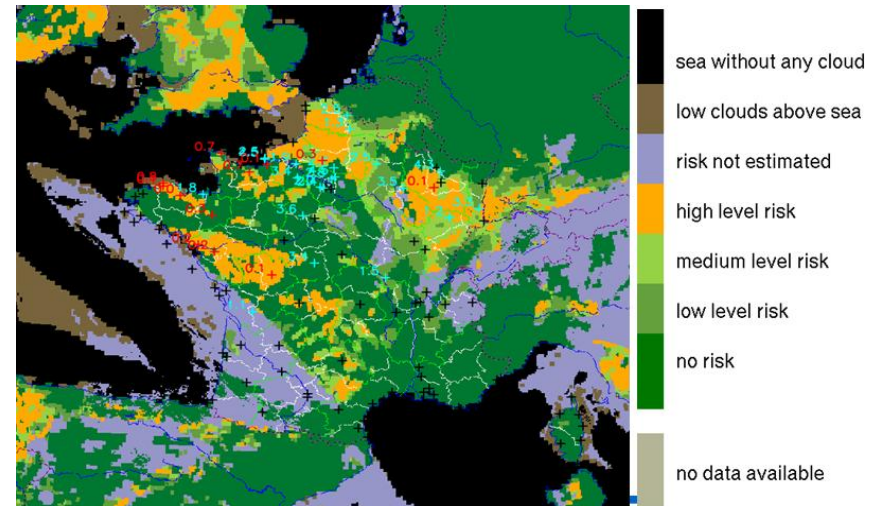low level risk
no risk

no data available

WG1: Initial data

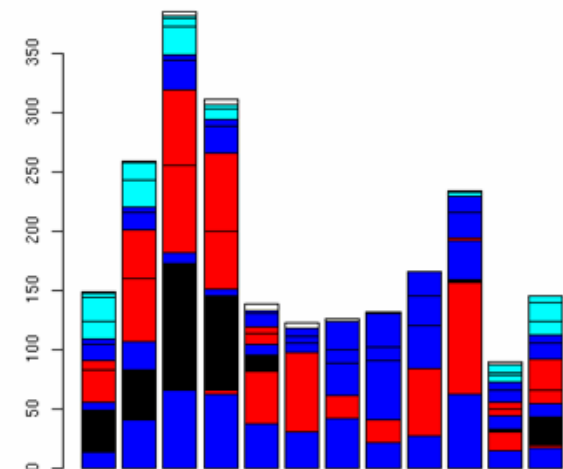- Satellite data for initializing models
- Combination of satellite and ground-based observations
- **Fog climatologies**
- Measurement techniques

Maarianhamina monthly frequency of vis<1000m

WG1: Initial data

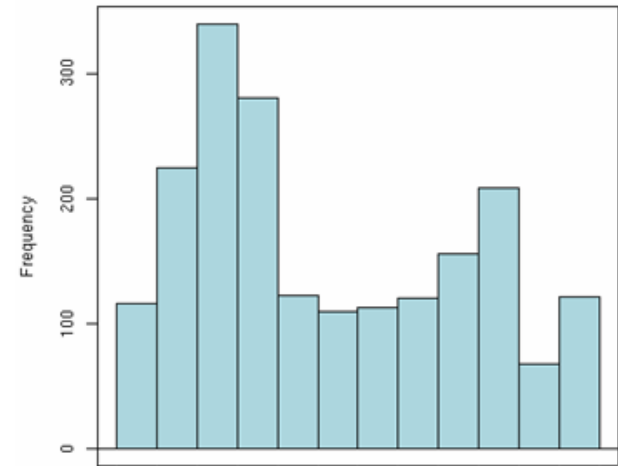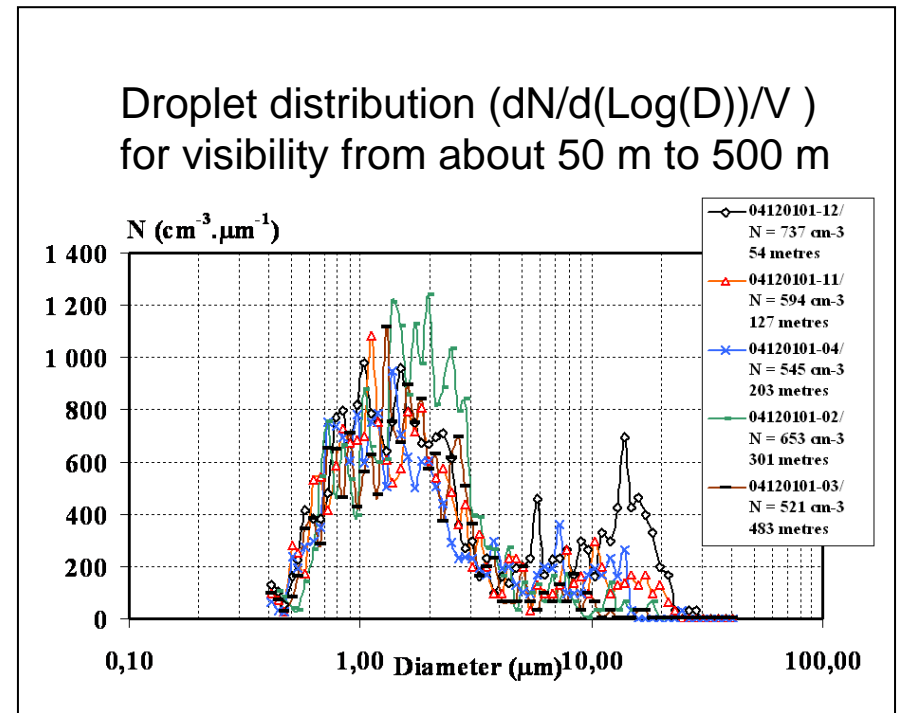- Satellite data for initializing models
- Combination of satellite and ground-based observations
- Fog climatologies
- **Measurement techniques**

Droplet distribution (dN/d(Log(D))/V) for visibility from about 50 m to 500 m

WG2: Models – Goals

- Improvement of model physics
- Specifying relevant input parameters ($\rightarrow$ measurement equipment)
- Parameterisations of which parameters are crucial for the forecasts' quality? (e.g., soil parameters, vertical velocity)
- Derivation of deterministic and probability forecasts (e.g., EPS)
- Model-intercomparison
    - potential and shortcomings of different models during different weather situations
    - better understanding of physical processes (co-operation with WG1)

WG3: Statistical methods – Goals

- Improving of forecasting methods

- Preparation of probability forecasts

- Relevant input parameters yielding hints for measurement equipments

- Transfer of methods developed for one location to another

WG3: Statistical Methods

- Decision trees, conceptual models, fog indices

- Methodology for selection of relevant predictors

- Neural Network

- Fuzzy logic (e.g., classifying weather situations likely to fog also in relation to fog climatology)

- Common verification procedure

WG3: Statistical Methods - Results

- Large sets of learning data required (especially for rare fog events).

- Testing and verifying model before operational use against an independent set of data.

- Statistical models built to forecast ceiling and visibility are highly site-specific

Future plans

- Follow-up-Action for COST-722 considered.
  - Focus on Cold fog (Ice fog), marine fog and aviation
  - Implications for severe weather and visibility
- Dinner tonight at 1930