



# ALPNAP

Monitoring and Minimisation  
of Traffic-Induced Noise and Air Pollution  
Along Major Alpine Transport Routes  
[www.alpnap.org](http://www.alpnap.org)



## Air Quality Modelling within ALPNAP

### Objectives

- Demonstration and assessment of advanced methods to simulate the concentrations of airborne pollutants such as NO, NO<sub>2</sub>, different VOCs, and PM as a function of the emissions
- Evaluation of the consequences of specific emission reduction measures (e.g. ban on certain vehicles as a function of time of day and year)

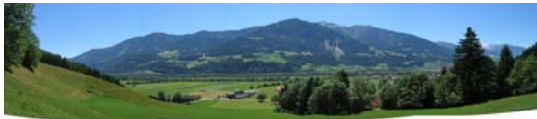


Photo: IMGI Innsbruck

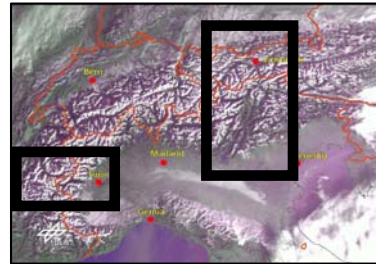
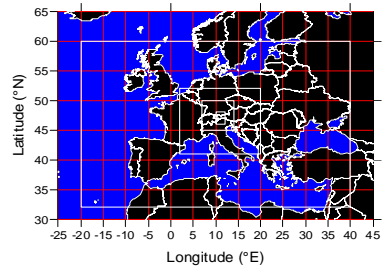
### Activities

- Setup of a model hierarchy from the micro- to the meso-scale for the calculation of traffic emissions, meteorological and air pollution parameters in a high spatial and temporal resolution
- Air quality simulations for the target areas in coarse (Fréjus) and high (Brenner) resolution for the base year 2004

### Nesting strategy – Target areas

Example nesting strategy for the Brenner domain

- D1: 66x59 grids -56.7 km
- D2: 79x70 grids -18.9 km
- D3: 88x79 grids -6.3 km
- D4: 79x94 grids -2.1 km

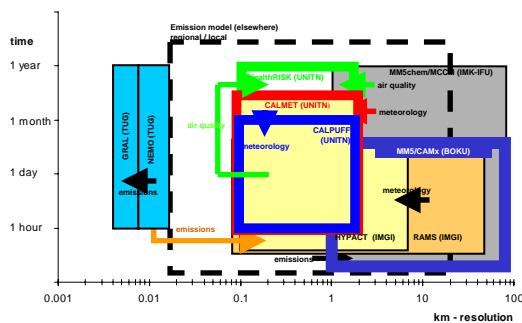


Satellite picture of the Alps from Dec. 17, 1999, 0749 GMT (received and processed by DLR)

Innermost modelling domains (D4) for the Fréjus target area and the Brenner target area

### Model hierarchy

The modelling system to be used for the calculation of the (traffic-)emissions, the simulation of meteorological and air pollution parameters and for assessing the health impact within the Brenner target area



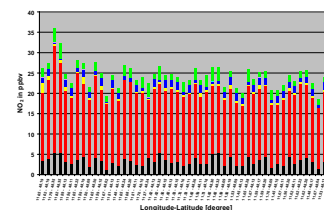
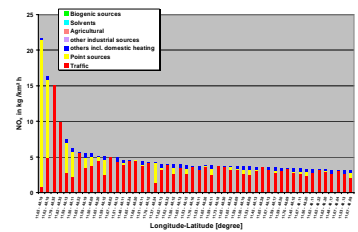
Meteorological and chemistry models to be used within ALPNAP

- NEMO / GRAL (emissions / lagrangian)
- RAMS / HYPACT (offline meteorology / inert chemistry)
- MM5chem / MCCM (online meteorology / full chemistry incl. PM)
- MM5-Zängl / CAMx (offline meteorology / full chemistry incl. PM)
- CALMET / CALPUFF / HealthRISK (offline meteorology / full chemistry / health impact)

### Source receptor analysis

Source receptor analysis as a basic instrument for emission reduction measures and health impact studies

Example for the source apportionment of NO<sub>x</sub> emissions for grid cells of 2x2km<sup>2</sup> resolution



Resulting NO<sub>2</sub> concentrations and its source composition within the same grid cells and the same sequence as above

Contact the work package leader (WP7: Air pollution – Monitoring and Prediction):

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