

Kosteneinsparende Erfassung von NATURA 2000-Lebensräumen in Gebirgsregionen mit Hilfe von Fernerkundung und GIS-Modellierung

Cost-saving mapping of NATURA 2000 sites in mountainous regions by means of remote sensing and GIS-Modelling

Individuazione economica degli habitat NATURA 2000 nelle regioni di montagna con l'ausilio del telerilevamento e di modellistica in ambito GIS

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### Structure

- Starting Point
- Remote Sensing Data
- Hard- and Software
- Test site in Bavaria
- Using Remote Sensing and GIS-Modelling for mapping of habitat types
- Outlook

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### Starting Point

Reserve against new technical methods

No remote sensing specialists in the forest administration

No hard- and software-equipment



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### Starting Point



more than 160.000 hectares of NATURA 2000 sites in more or less difficult terrain conditions are to map

Terrestrial mapping will take a high amount of time and money

Tense situation of public budgets

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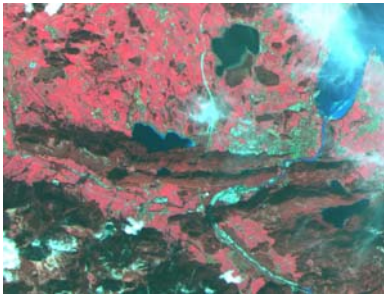
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### Remote Sensing Data



#### Satellite data

ASTER, resolution 15m, 0,02 €/km<sup>2</sup>

IKONOS, resolution 1m, 18,40 €/km<sup>2</sup>

No Stereo View!

IKONOS Stereo, 85 €/km<sup>2</sup>

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### Remote Sensing Data



#### Satellite Data

Aerial Photo, natural colors, 0,40m, stereo

Aerial Photo, color-infrared, 0,10m, stereo; 60 €/km<sup>2</sup>

Scans of aerial photos with photogrammetric scanner

- resolution 12,5 µm, tif-Format
- Image-file 1,0 GB + Statistic-File 0,4 GB = 1,4 GB/photo

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## Hard- and Software



- Digital Photogrammetric Workstation with
- 3D-Graphics card
  - Monitor, vertical refresh rate not less than 120 Hz
  - LCD glasses

- Software for
- Photogrammetry (georef.)
  - 3D-View

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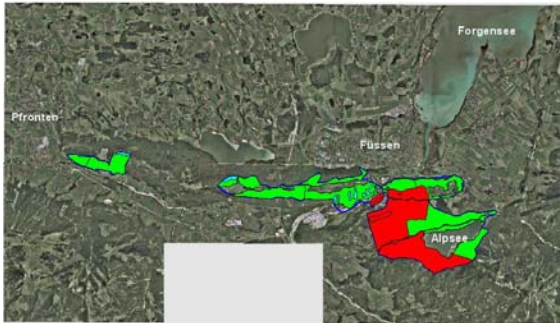
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## Test site in Bavaria



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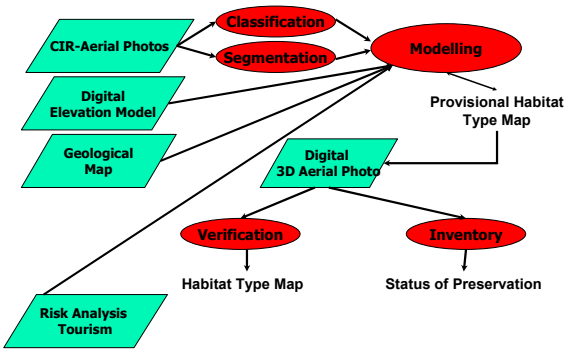
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## Mapping of Habitat Types



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### Mapping of Habitat Types

CIR Aerial Photos, 20. Juni 2005



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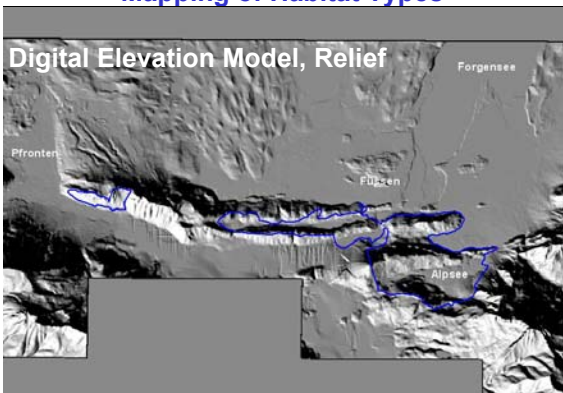
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### Mapping of Habitat Types

Digital Elevation Model, Relief



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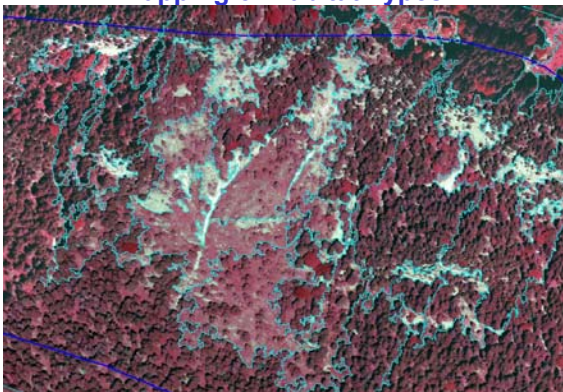
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### Mapping of Habitat Types



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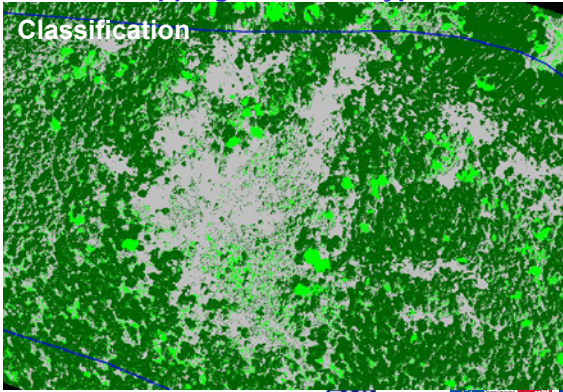
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### Mapping of Habitat Types

#### Classification



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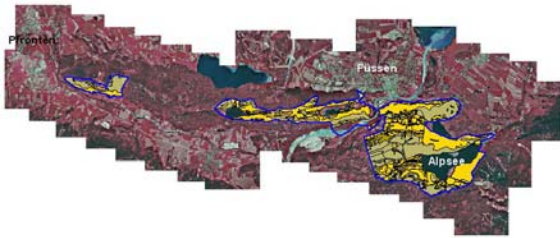
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### Mapping of Habitat Types

#### Provisional Habitat Type Map



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### Mapping of Habitat Types



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## Mapping of Habitat Types

Verification on 3D-View  
with different qualities  
of results:

- Accepted
- modified
- rejected

Ground truthing is confined on habitats which  
are not clear or not recognizable in remote  
sensing data or not possible by modelling!

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## Mapping of Habitat Types

### Happy Forester!



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## Outlook



Digital Aerial Photos from

- Matrix-Camera (DMC, VEXEL)
- Line-Scanner (ADS)

Digital Elevation Model from  
Laser Scanning



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## Outlook

Future Remote Sensing Sensors for NATURA  
2000 purposes (e. g. monitoring):

### TerraSAR

- Radar sensor
- independent of weather conditions
- Different Modi
- Launch in end of 2006

### GEOEYE-1

- Panchromatic, spatial resolution 0,41 m
- Multispectral, spatial resolution 1,64 m
- Stereo View possible
- Launch in 2007

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Thank you for your interest!

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