METEOROLOGICAL APPLICATIONS at NIMH, ROMANIA

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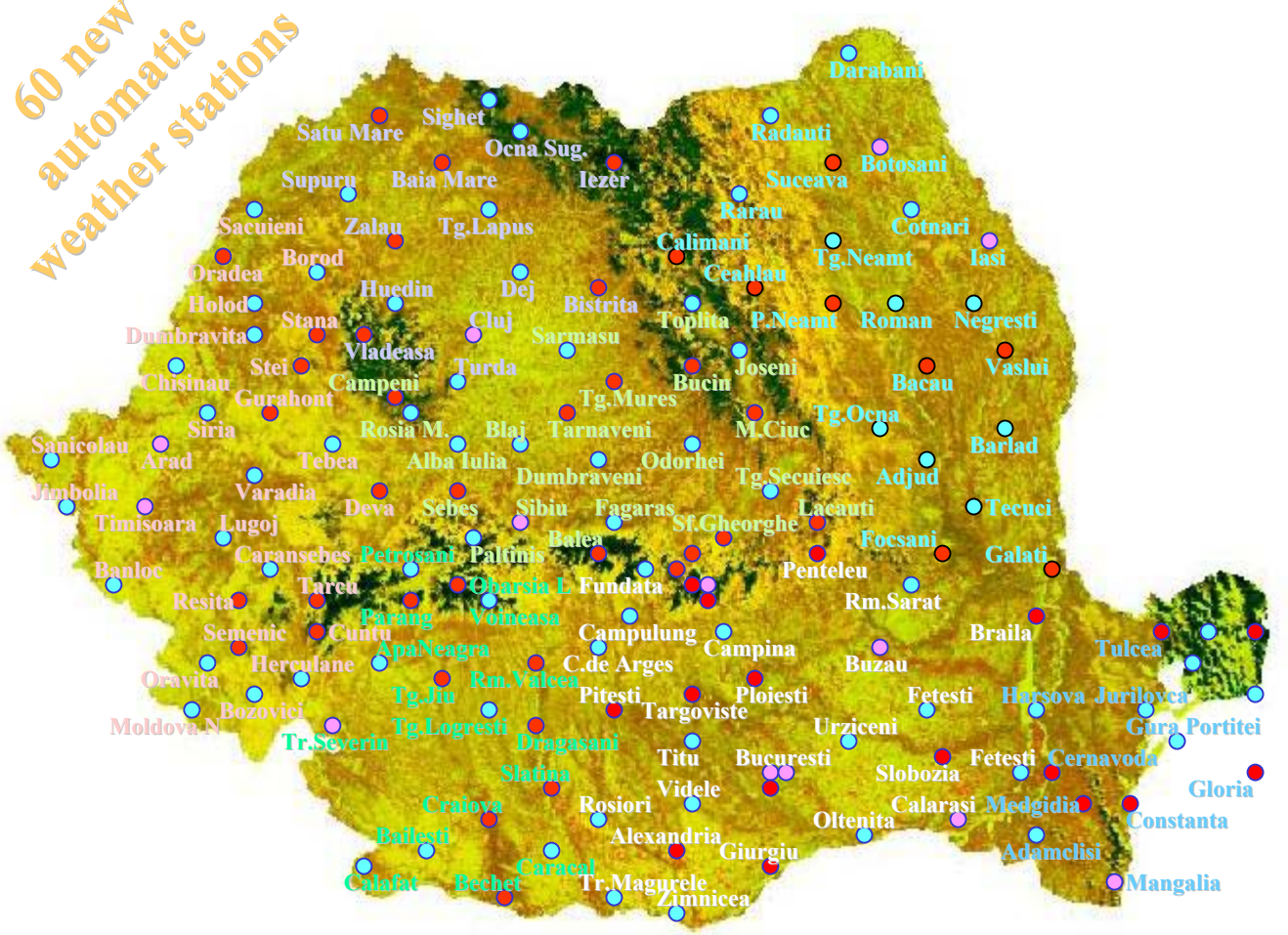
Surface measurement network

60 new automatic weather stations



LEGEND

- Weather station (90)
- Automatic weather station (10)
- SIMIN automatic weather station (60)

SOP

application for Romanian surface data collection, validation and visualization

VISUALIZATION:

- WMO standard messages
- table and graphs for each parameter
- geographicaly plotted form

✓ for one parameter

✓ Bjerknes scheme

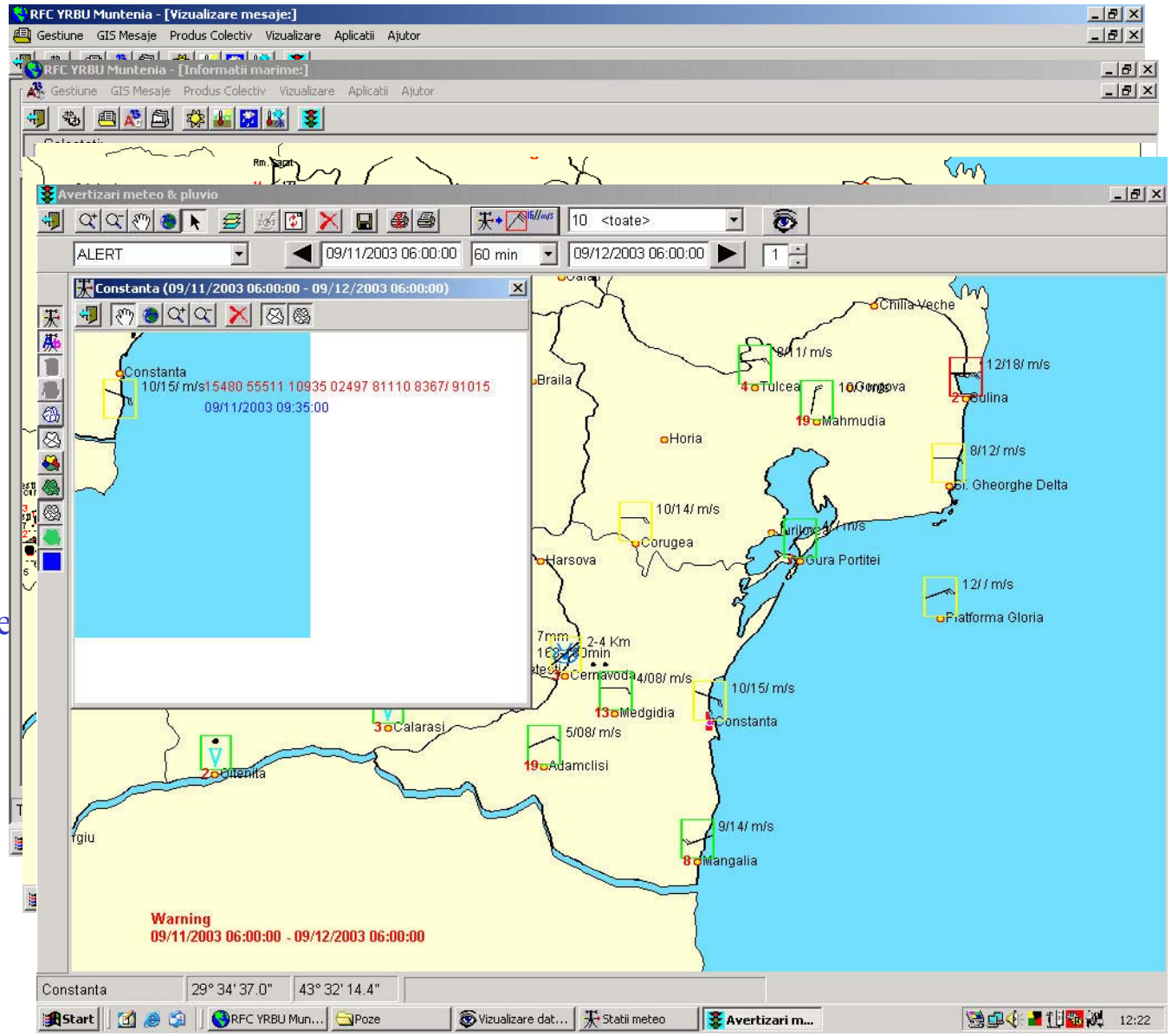
✓time differences for a given parameter at two selected time

✓variance from climatological values, for a given parameter

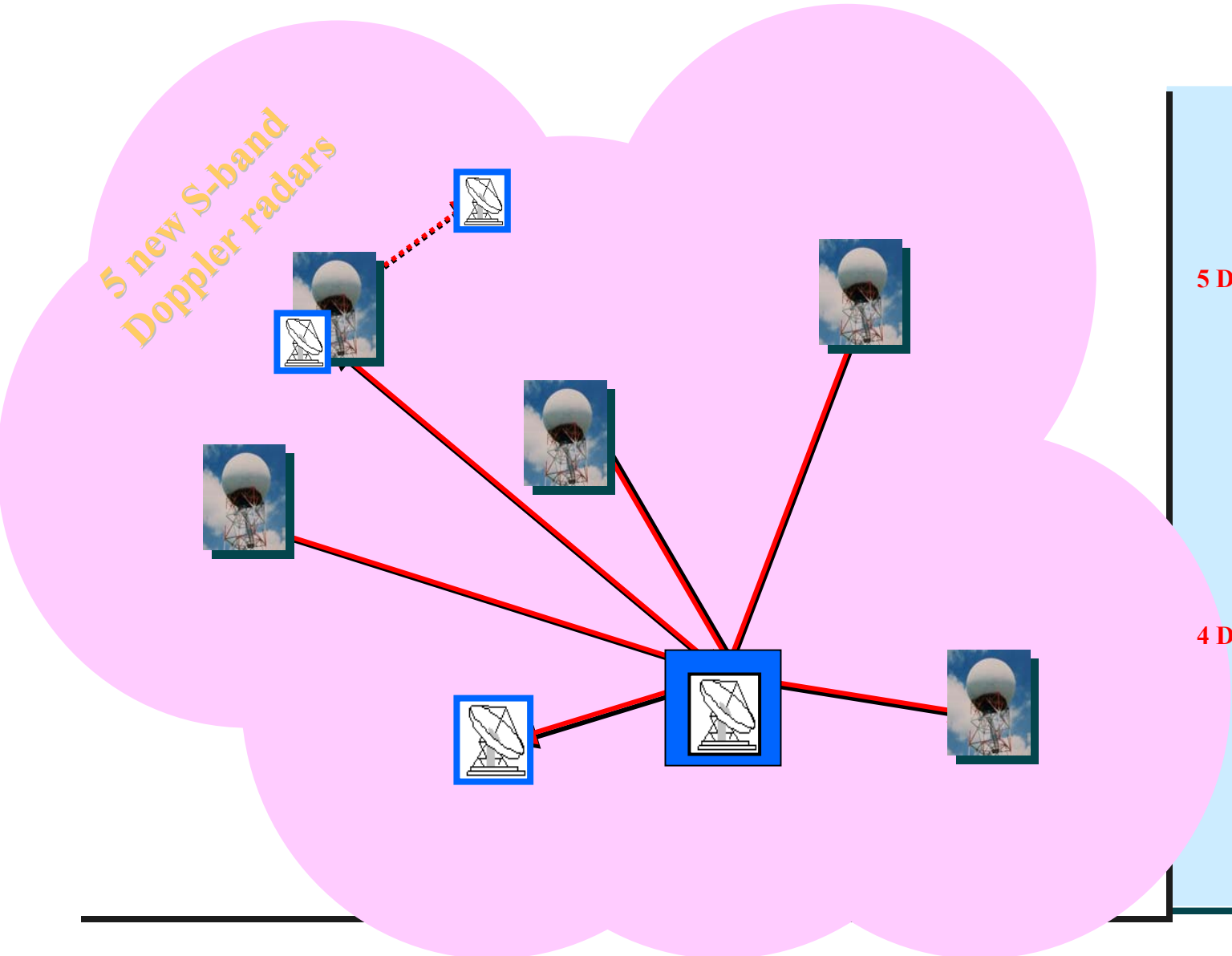
✓sum of a selected parameter for a given interval

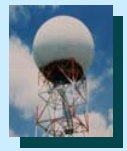
✓comparison with INMH forecast model outputs

✓Warnings for a given interval



Radar measurement network





5 DOPPLER - S band (WSR-98D)

BARNOVA

MEDGIDIA

TARNAVENI

TIMISOARA

ORADEA

4 DOPPLER - C band

BUCURESTI

CRAIOVA

ORADEA

IGNIS

PUP (Principal User Processor)

dedicated display system directly attached to the WSR-98D radar sensor.

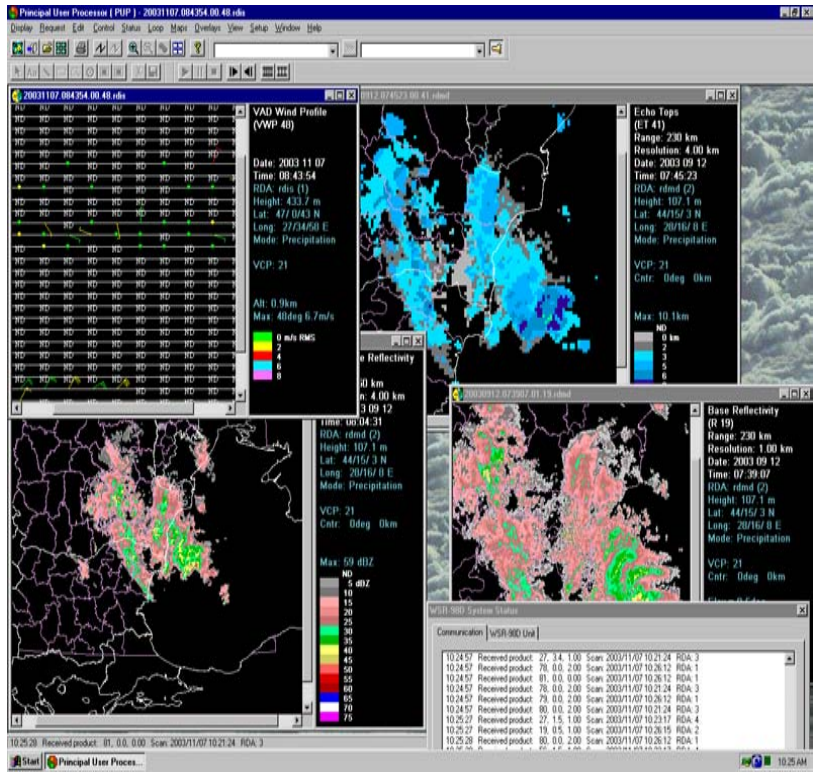
•receives base and derived radar products from the RPG

•provides a seamless integration of data acquisition (S and C-band radar data)

•display, manipulate, and analyse quickly a great variety of products:

- •stand-alone image products
- •image overlay products
- •alphanumeric products
- •time lapse looping
- •image algorithm processing
- •hard copy

•local control
•status monitoring
•local annotation
•distribution of products by operational personnel
•product archiving



PUP products

1. Base Reflectivity (R)
2. Base Velocity (V)
3. Base Spectrum With (SW)
4. Reflectivity Constant Altitude Plan Position Indicator (CAR)
5. Velocity Constant Altitude Plan Position Indicator (CAV)
6. Spectrum Width Constant Altitude Plan Position Indicator (CAS)
7. Composite Reflectivity (CR)
8. Composite Reflectivity Contour (CRC)
9. Echo Tops (ET)
10. Echo Tops Contour (ETC)
11. Severe Weather (Reflectivity)
12. Severe Weather (Velocity)
13. Severe Weather (Spectrum Width)
14. Severe Weather (Shear)
15. Severe Weather Probability (SWP)
16. VAD Wind Profile (VWP)
17. Cross Section Reflectivity (RCS)

18. Cross Section Velocity (VCS)
19. Cross Section Spectrum Width (SCS)
20. Weak Echo Region (WER)
21. Storm Relative Mean Radial Velocity Region (SRR)
22. Storm Relative Mean Radial Velocity Map (SRM)
23. Vertically Integrated Liquid (VIL)
24. Storm Tracking Information (STI)
25. Hail Index (HI)
26. Mesocyclone (M)
27. Tornado Vortex Signature (TVS)
28. Storm Structure (SS)
29. Layer Composite Reflectivity (LRA)
30. Layer Composite Reflectivity (LRA)
31. Layer Composite Reflectivity (LRM)
32. Layer Composite Turbulence (LTA)
33. Layer Composite Turbulence (LTM)

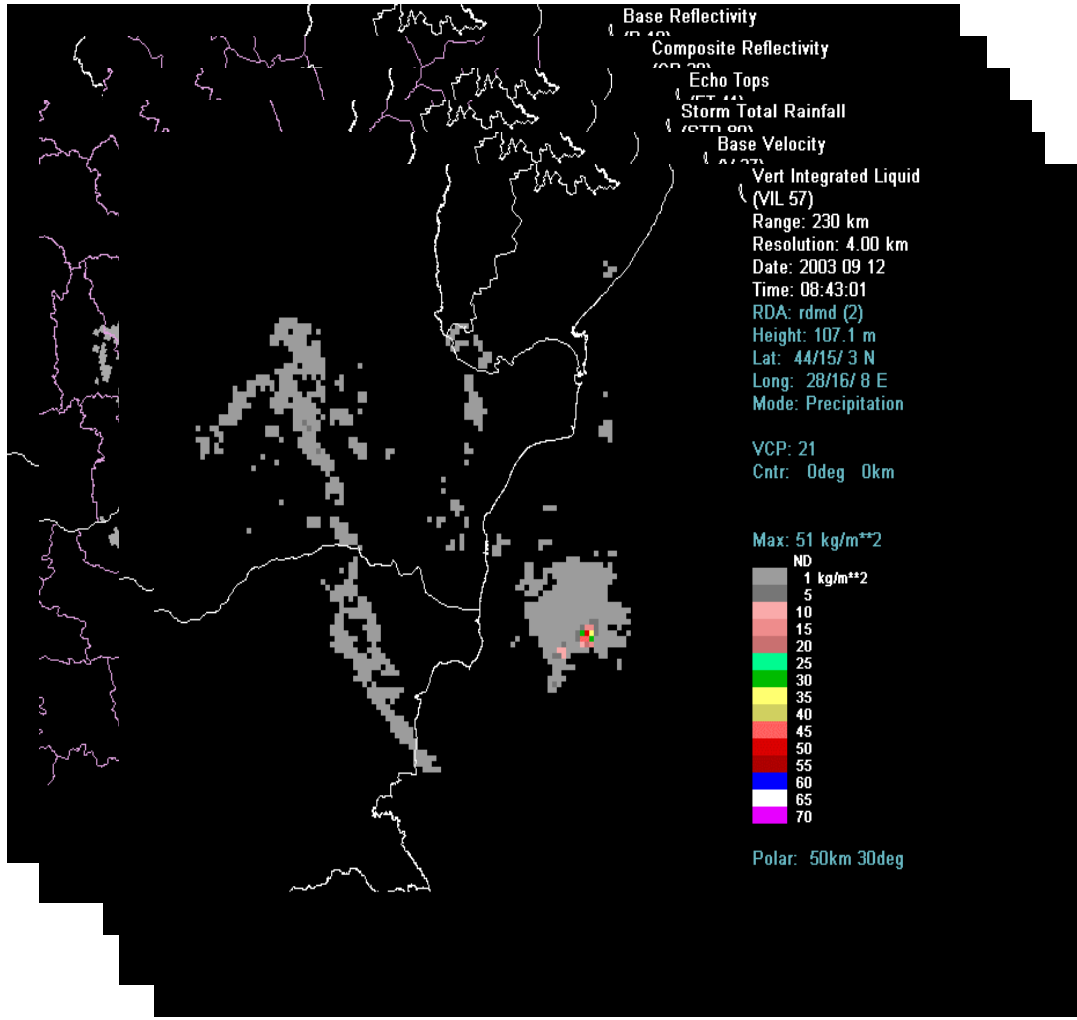
PUP products

34. User Alert Message (UAM)
35. Free Text Message (FTM)
36. PUP Free Text Message (PTM)
37. Surface Rainfall Accumulation - One-Hour Precipitation (OHP)
38. Surface Rainfall Accumulation - Three -Hour Precipitation (THP)
39. Storm Total Rainfall Accumulation (STP)
40. Hourly Digital Precipitation Array
41. Supplement Precipitation Array
42. Velocity Azimuth Display (VAD)
43. Cross Section Reflectivity (RCS)
44. Cross Section Velocity (VCS)
45. Combined Shear (CS)
46. Ccombined Shear Contour (CSC)
47. Layer Composite Reflectivity (LRA)
48. Layer Composite Reflectivity (LRM)

PUP (cont)

some products

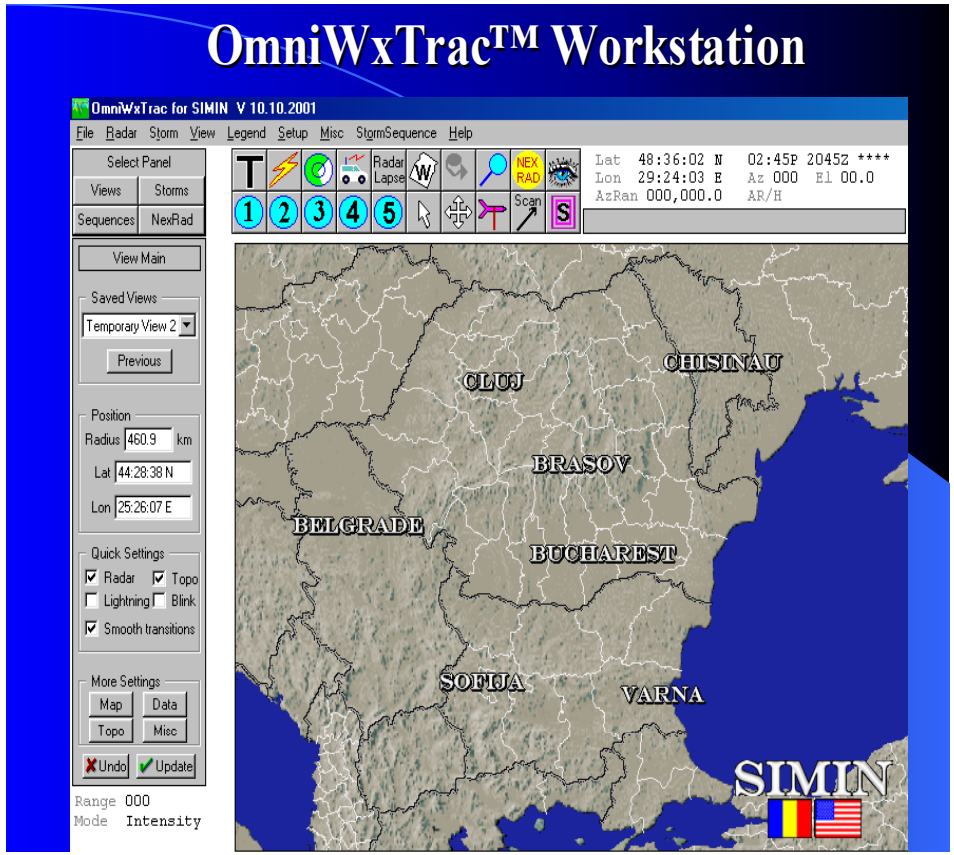
- Base Reflectivity Tilt 1
- Composite Reflectivity
- EchoTop
- Storm Total Rainfall Accumulation
- Velocity
- Vertical Integrated Iiquid (VIL)



OmniWxTrac

fully featured tool for radar data display and manipulation

- receive, display, analyse and manipulate data from all individual radar sites or national mosaic
- wind shear identification algorithm
- storm cell tracks and post estimated times of arrival for local communities algorithm
- geographical tools (zoom and pan around a region while maintaining seamless and proportional roadways, icons and other graphics)
- precipitation-type (rain, mixed, snow)



OmniWxTrac (cont)

- Reflectivity
(tornado event, September 12, 2003)

- Future scan (displays up to thirty minutes of the projected radar data)

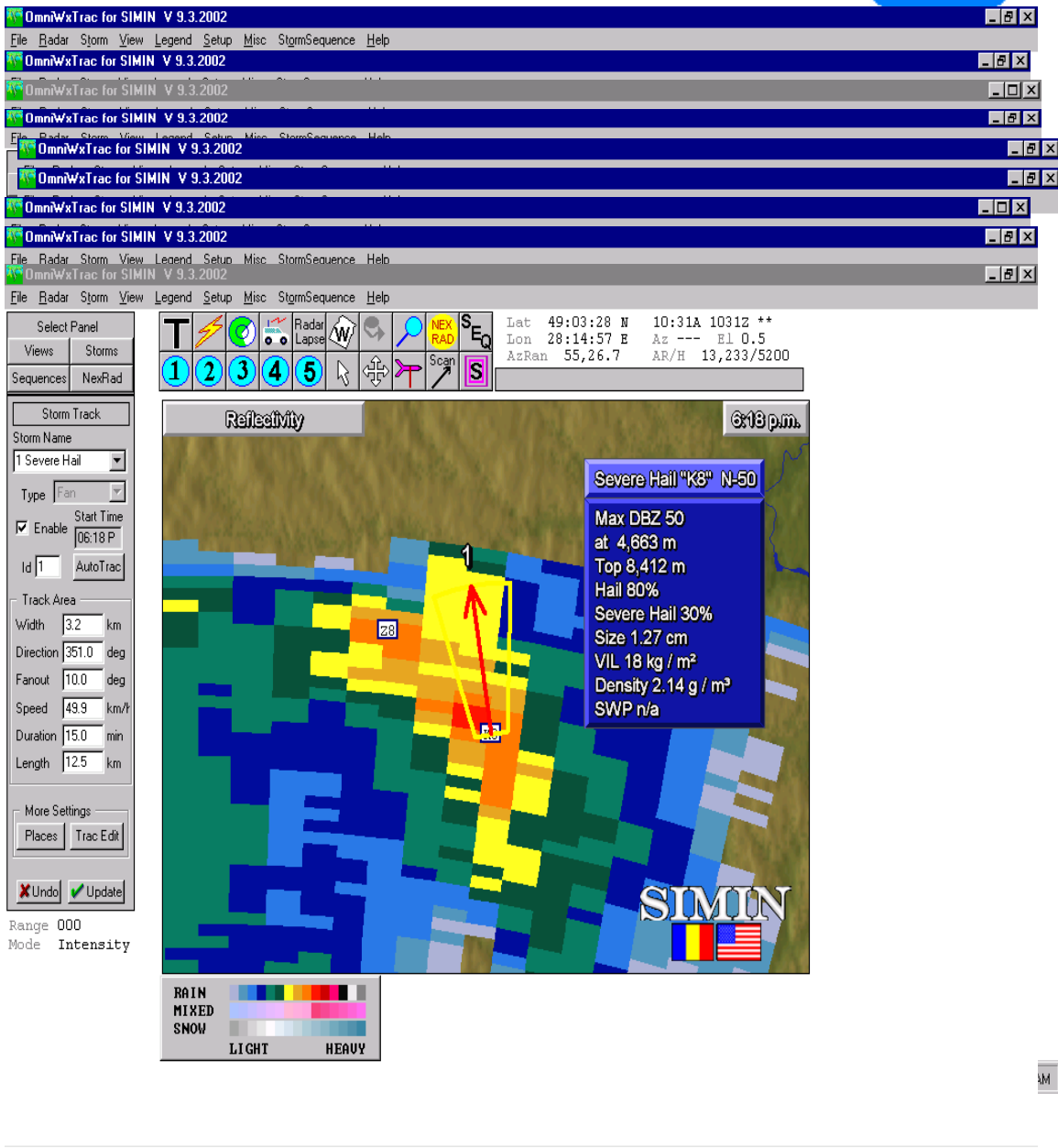
- Snow Machine (depicts the type of Winter weather affecting the region)

- City Streets (provides mapping of roads for major cities)

- National Mosaic from multiple radar sites (three types)

- Wind shear marker

- Storm track

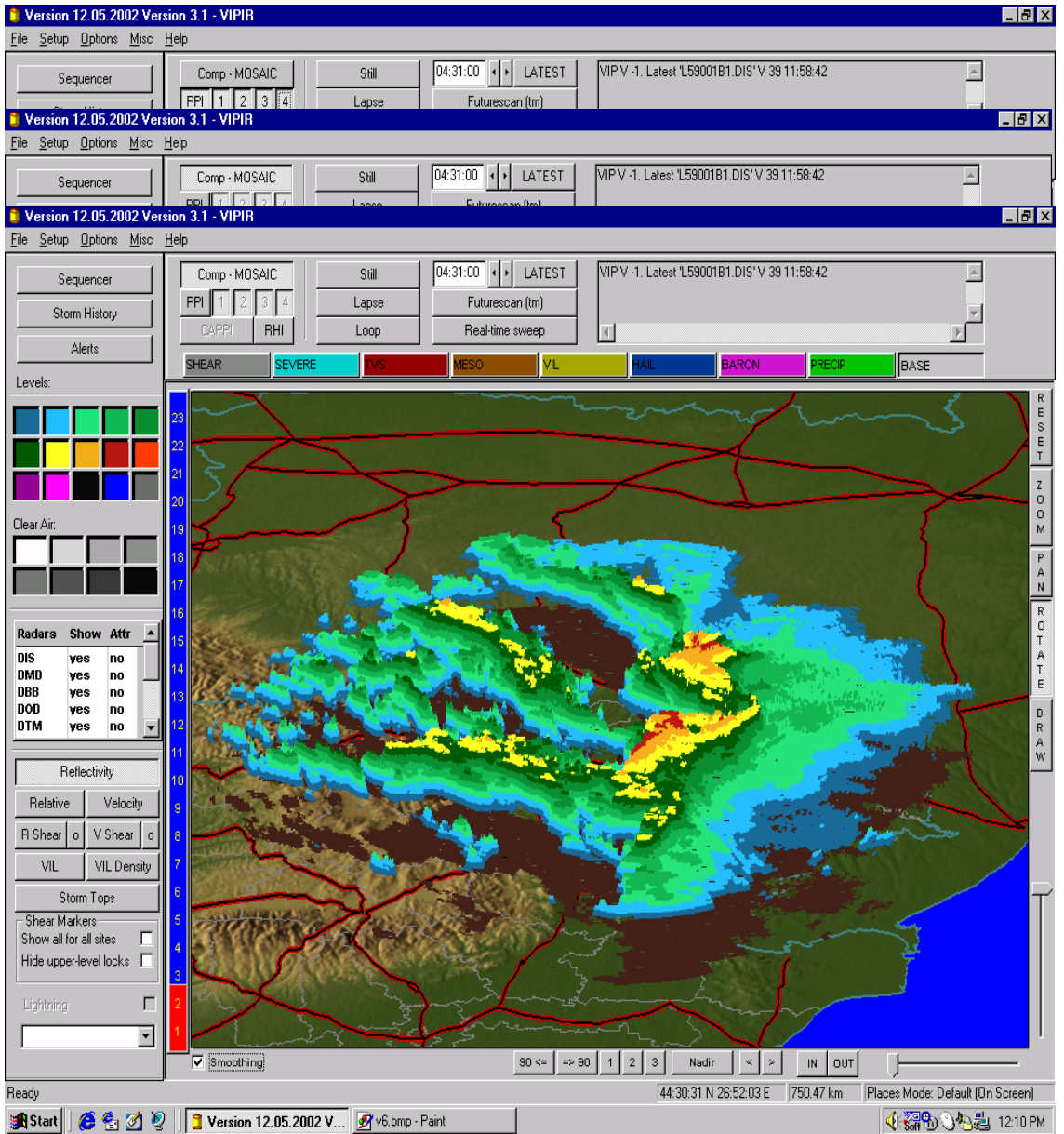


VIPIR
(Volumetric Imaging and Processing for Integrated Radar)

•gives the user the ability to view multiple layers of multiple radars at the same time- a unique perspective of where dangerous portions of the storm are in relation to what is happening at the surface

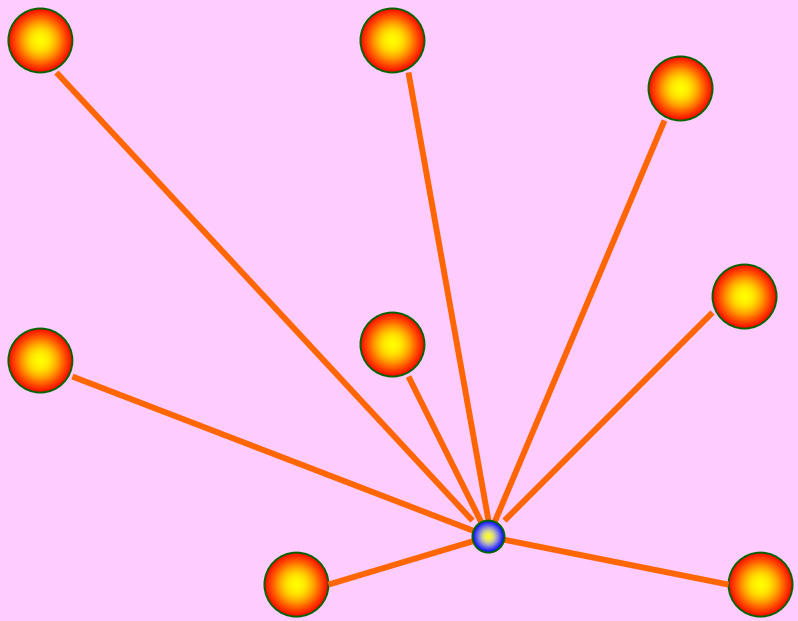
•gives the user powerful radar products that alert you to severe weather events:

- •dangerous Twisting of the Winds
- •dangerous hail
- •unsafe precipitation totals



Lightning detection network

8 electrical discharge sensors



LIGHTNING DETECTORS

SITES

BOROD

Vf. CALIMANI

VASLUI

Vf. TARCU

Vf. OMU

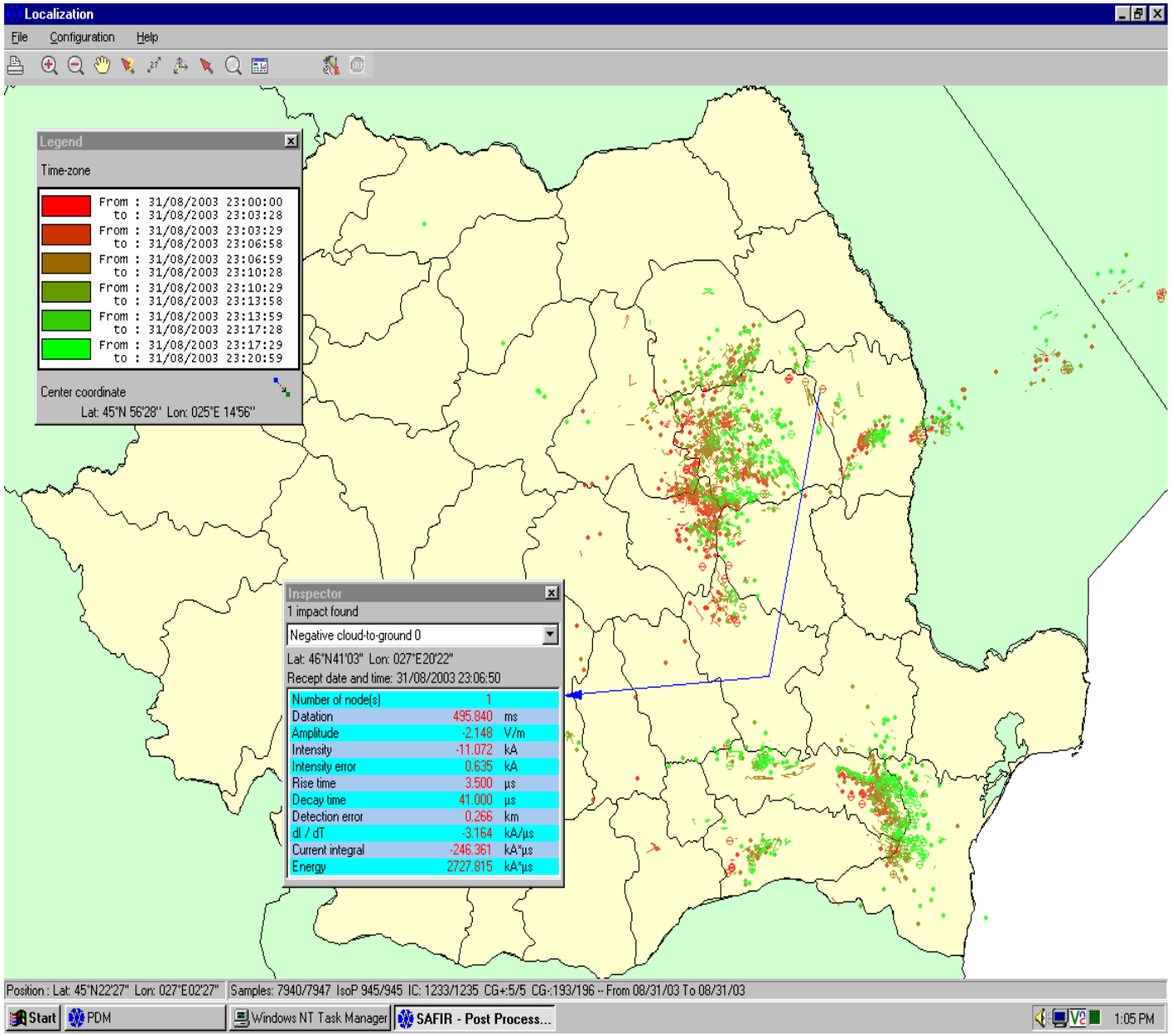
GALATI

CARACAL

ADAMCLISI

SAFIR 3000 PDM

- Lightning discharges (IC and CG)
- Lightning discharges density
- Lightning discharges cells
- Specific discharge information
- Monitoring area function
- Geographical tools

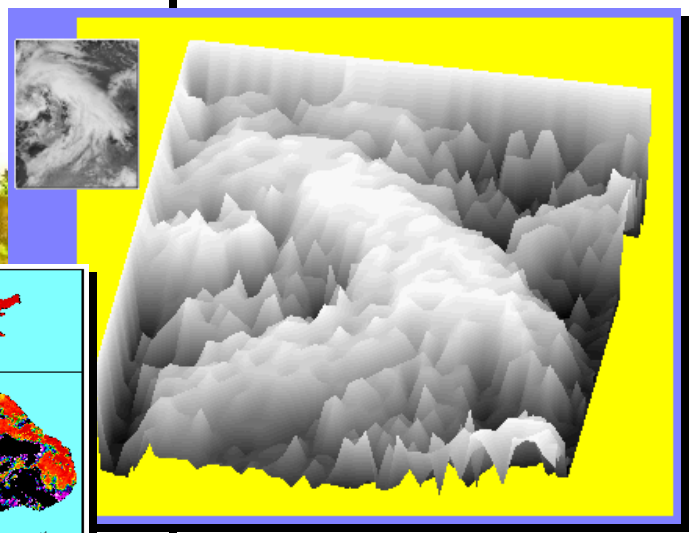


Satellite numerical data

METEOSAT data reception and processing station

- MET 7 (operational)
- MSG (pre-operational)

NOAA HRPT data reception and processing station



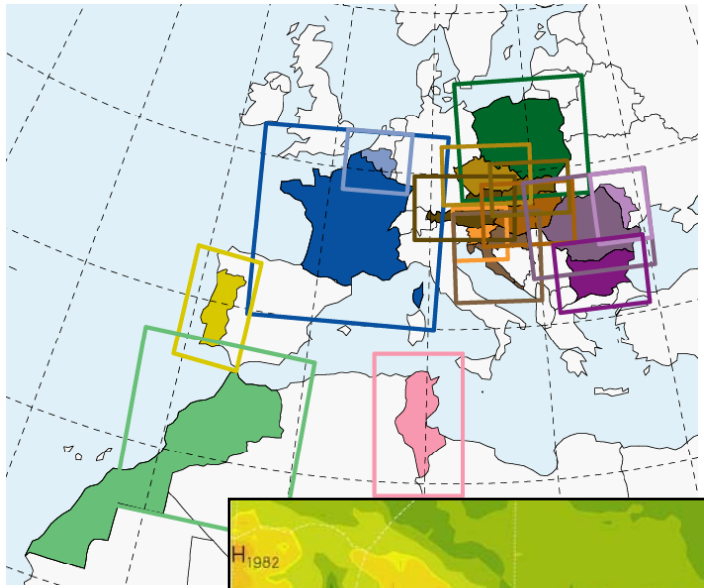
Atmospheric and related models used at NIMH

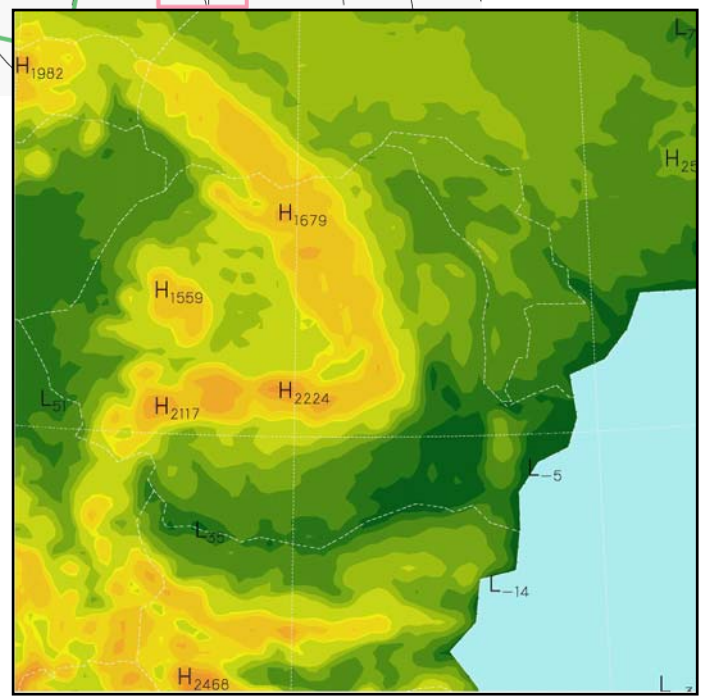
- ALADIN developed inside the Aladin project (15 countries)

- MM5: PSU/NCAR nonhydrostatic model

- Wave Models

- Global atmospheric models:
  - ARPEGE
  - GSM
  - ECMWF
  - DWD
  - UKMET



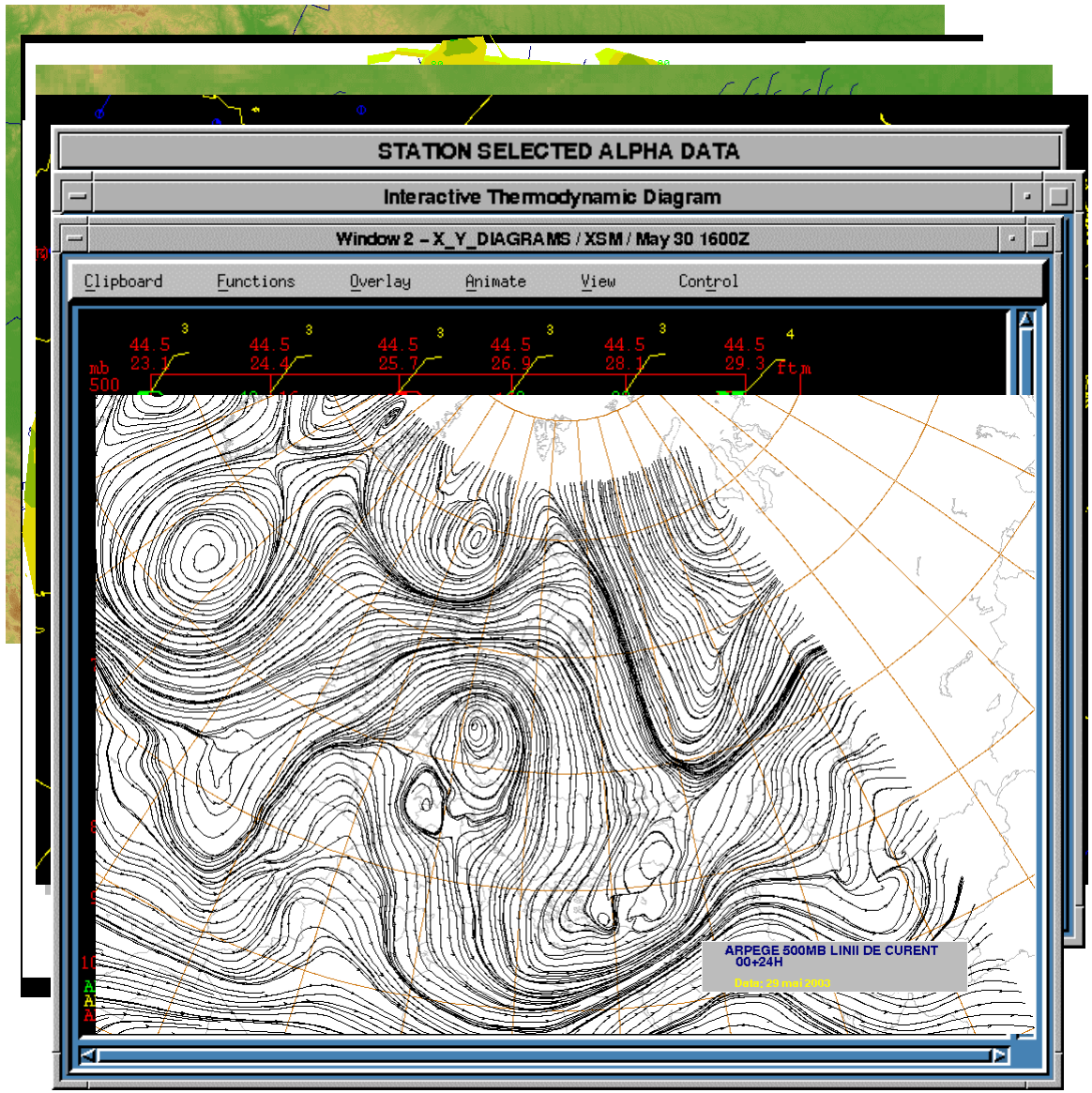


NeX-REAP integrating visualization application

- Data receiving, collecting and organizing
- Real (surface, upper air, radar, satellite and lightning) data and model outputs visualization in graphic forms
- Alphanumeric message visualization
- Ad-hoc and automatic product generation (combined data)
- Manual vector graphic products
- Geographical tools (coordinates, distance)
- Product (automatic) distribution to Associated Subscribers using Briefing Terminals
- Weather product archiving

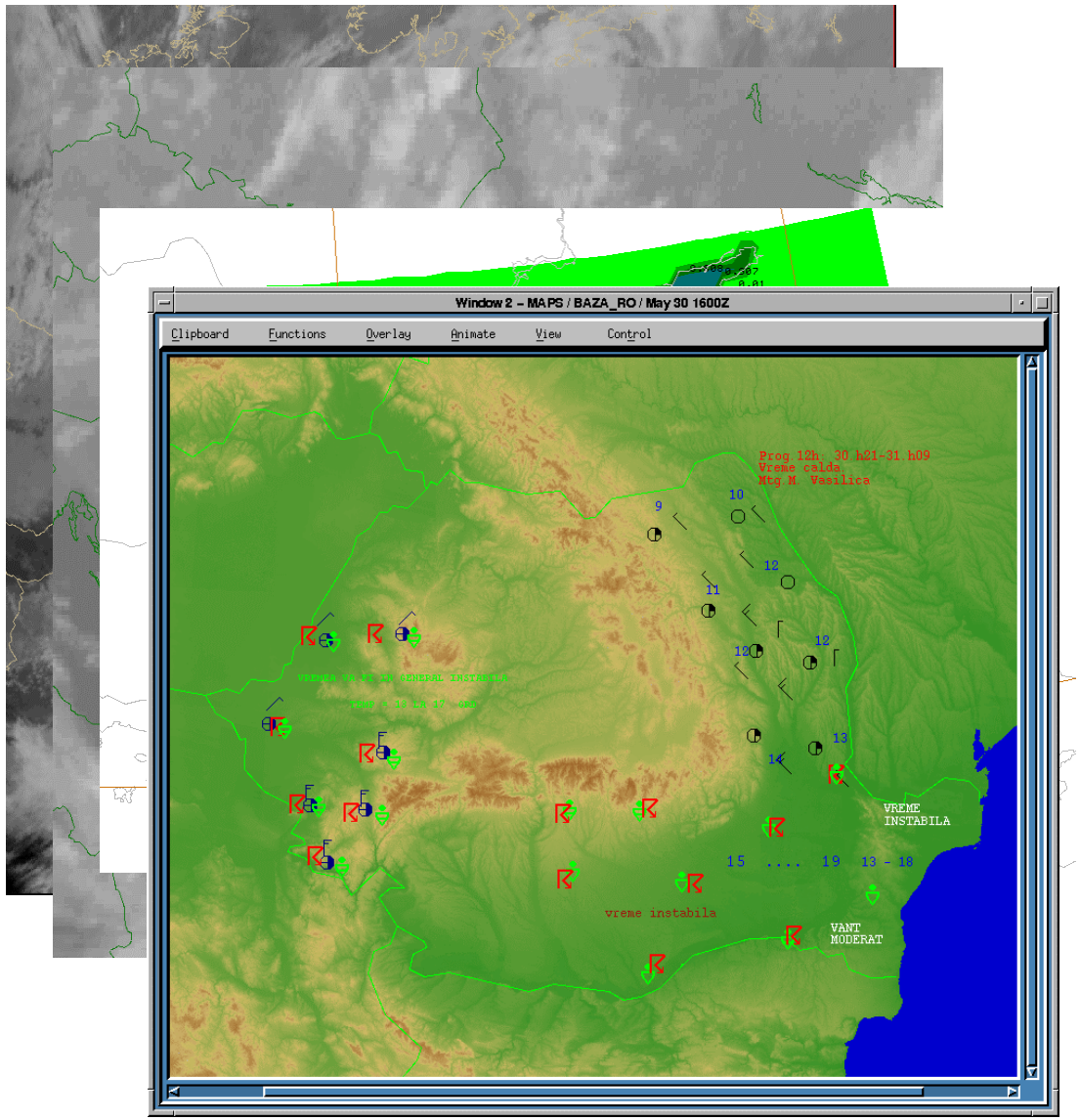
NeX-REAP integrating visualization application (cont)

- Surface and upper air real data visualization
- Grib data and T4 chart visualization ARPEGE, GSM, RCMWF, DWD, UKMET, ALADIN, MM5
- Data overlay
- Alphanumeric data (TEMP and SYNOP)
- Thermodynamic analysis products (real and forecast diagram and vertical cross section)
- Stream lines

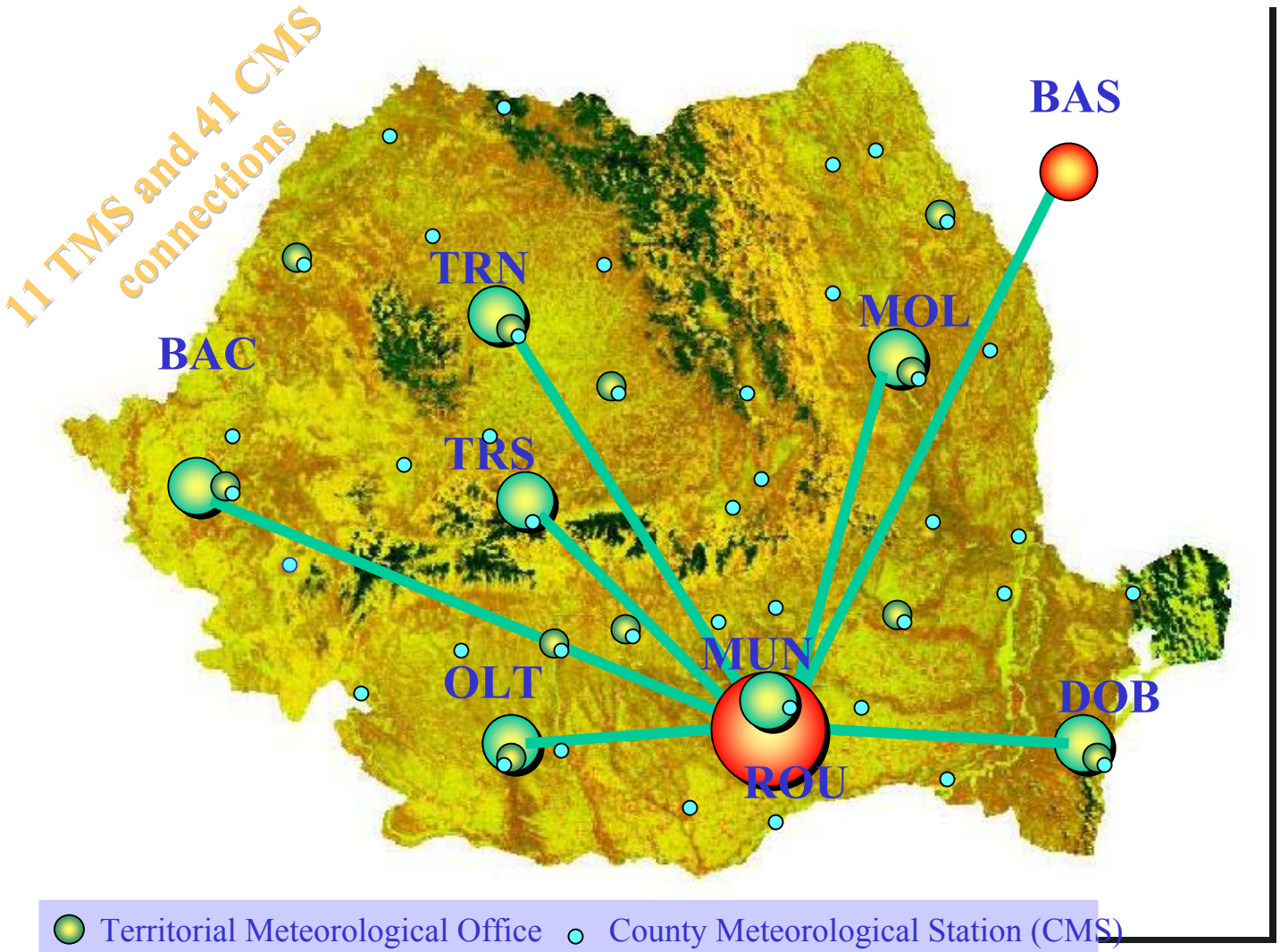


NeX-REAP integrating visualization application (cont)

- Satellite, radar and lightning data visualization
- Wave model output
- Preparation of weather forecasts, warnings and advisories
- Display tools
- Printing



Forecasting network



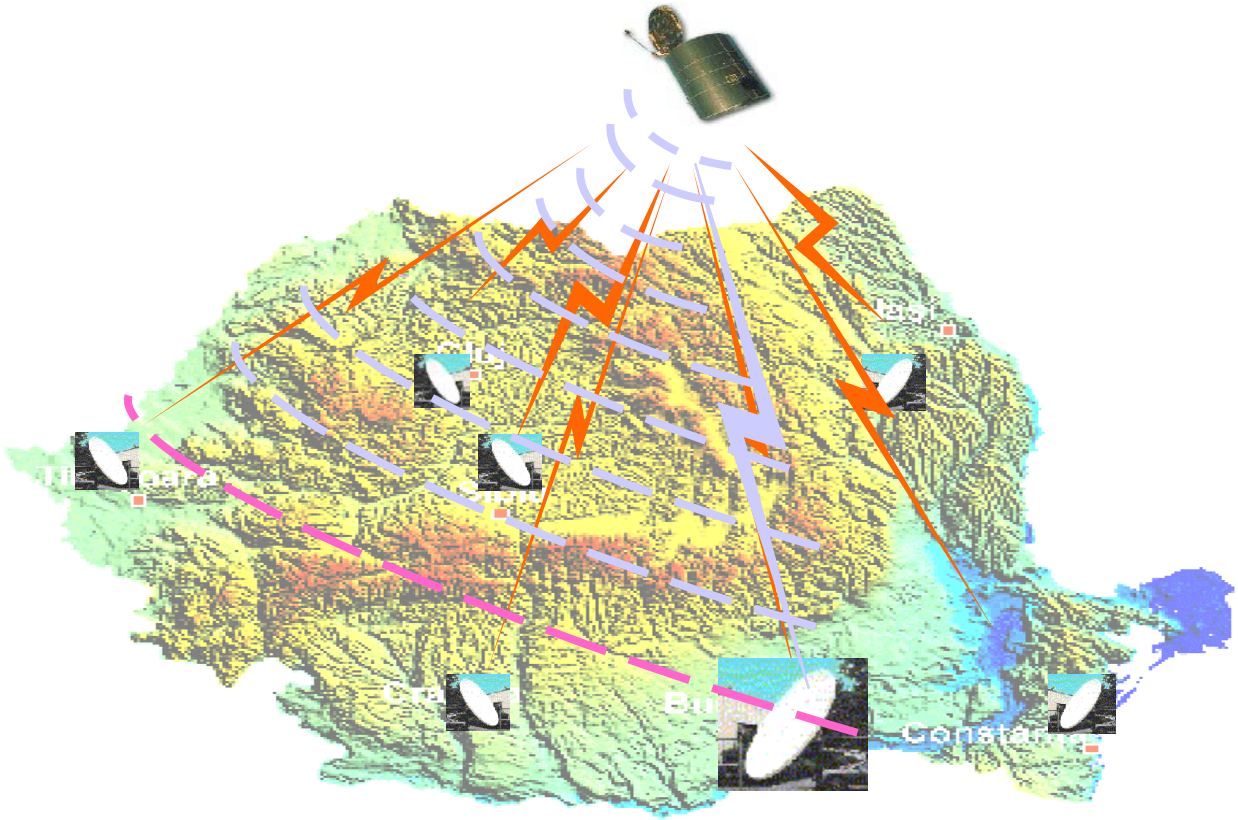
National Forecasting Centre
- Bucharest - ROU

Regional Forecasting Centres

- Bucharest - MUN
- Constanta - DOB
- Bacau - MOL
- Cluj - TRN
- Sibiu - TRS
- Timisoara - BAC
- Craiova - OLT

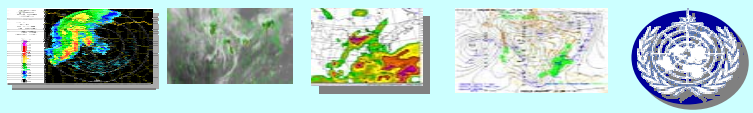
- Chisinau - BAS

Review SIMIN VSAT Communications WAN



TDMA Satellite Communications
Full mesh VSAT network
disseminating sensor data

SIMINCast Broadcast of the combined stream of basic shared data used to generate Local Products



COF (Central Operational Facilities)

- SOP
- PUP
- OmniWxTrac
- VIPIR
- SAFIR
- NeX-REAP

Questions ???

and with luck some Answers