



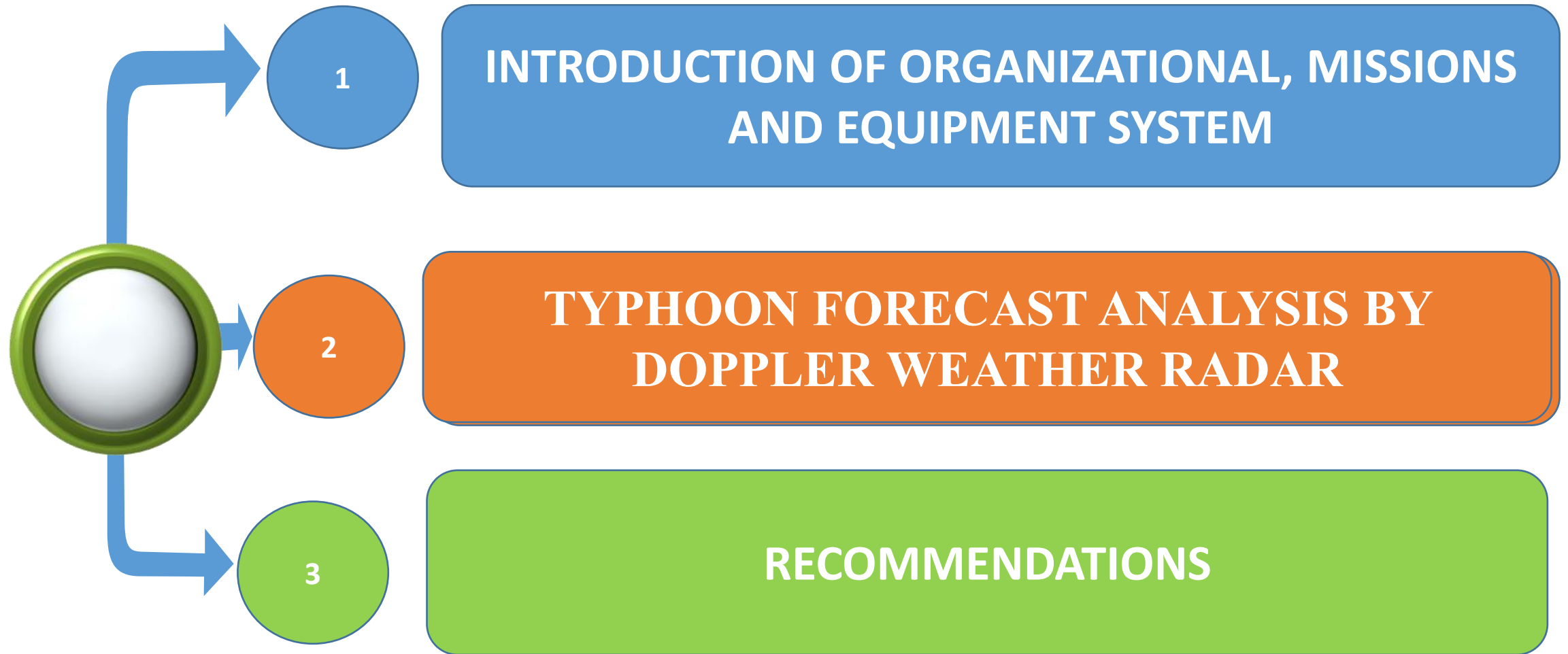
Typhoon Forecast Analysis by Doppler Weather Radar

Le Dinh Quyet

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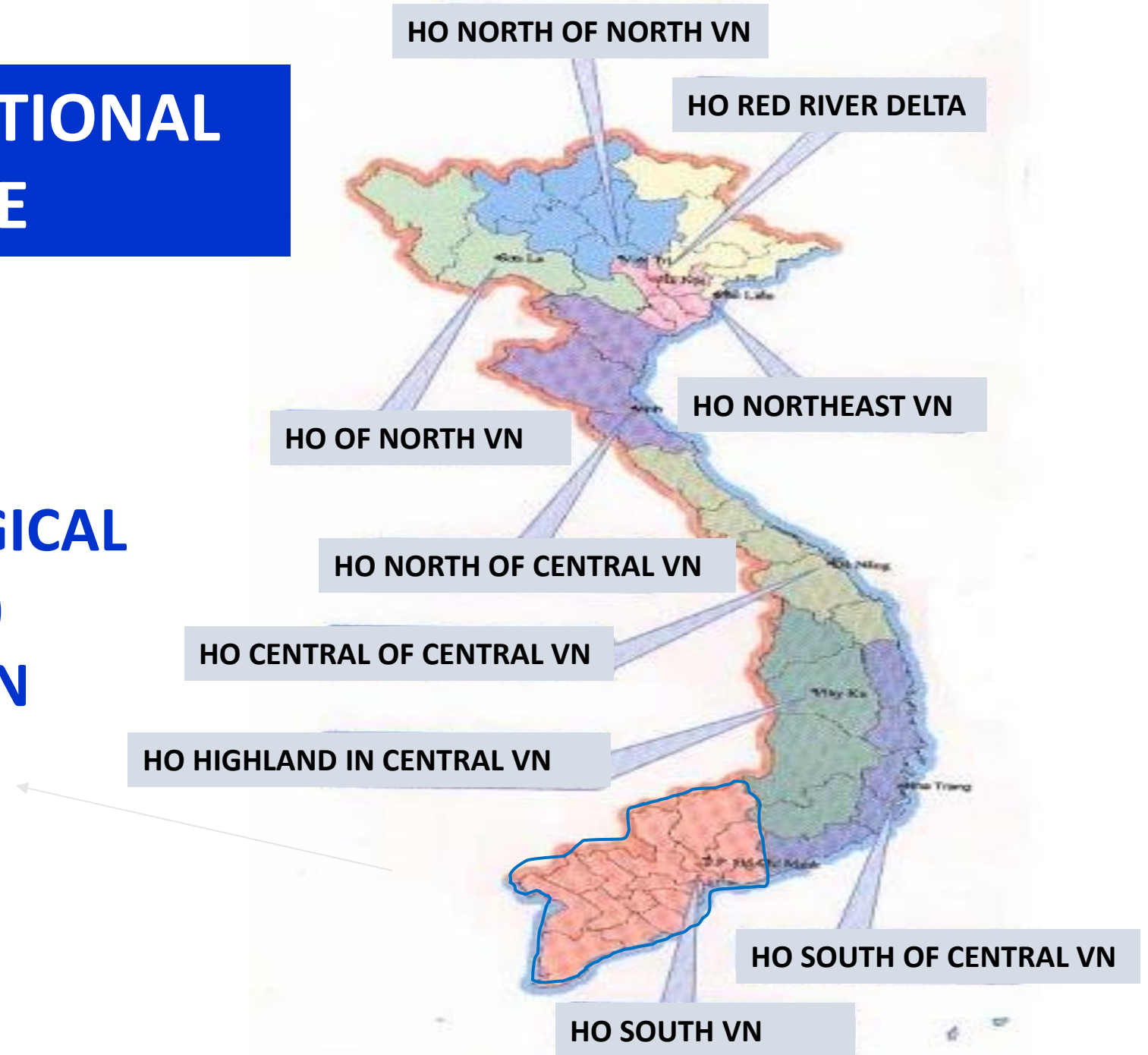
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CONTENT



PART 1: ORGANIZATIONAL STRUCTURE

LOCATIONS OF HYDROMETEOROLOGICAL OBSERVATORIES (HO) IN SOUTHERN REGION



SUBORDINATE UNITS

1. FUNCTIONAL DIVISIONS (06):

- Office
- Stations Network Management Division
- Forecasting Division
- Hydrometeorological Information and Data Division
- Environmental Analysis Laboratory
- Financial – Planning Division

2. CENTERS(02):

- Cuu Long River Hydrological Center
- Hydrometeorological and Environmental Consultancy Service Center

FUNCTIONS AND MISSIONS

- Managing and organizing basic investigation, monitoring and adjusting database of meteorology, hydrology, marine, air and water, solar radiation.
- Making meteorological, hydrological and environmental warnings and forecasts for disasters prevention and socio-economic development.
- Providing services and consultancy in the field of hydrometeorology (survey, forecast, data calculation, ...) for domestic and foreign units.
- Conducting scientific researches and projects on hydrometeorology and climate change.

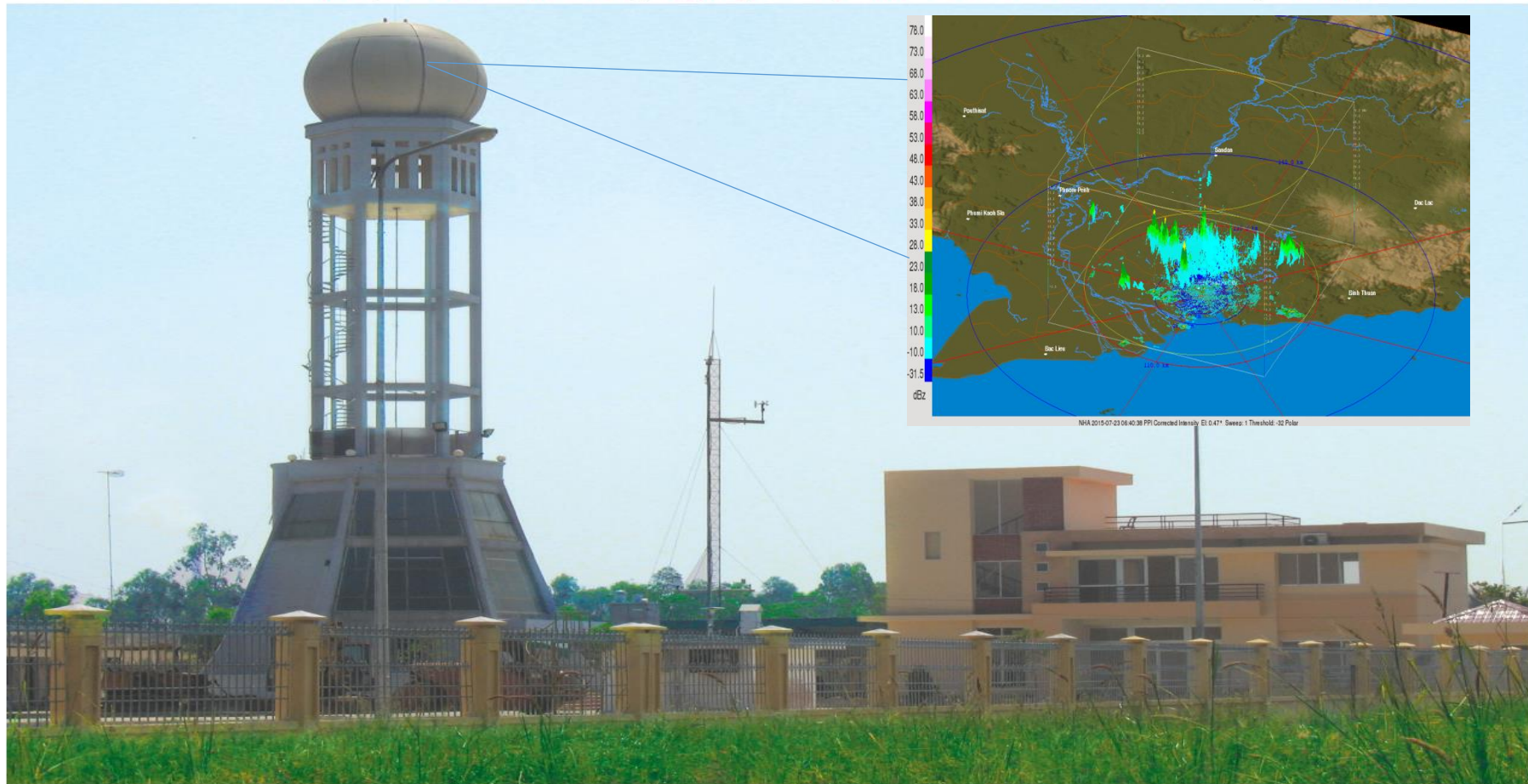
MONITORING STATIONS NETWORK

- 30 Weather Stations (17 Automatic Weather Stations)
- 01 Radiation, ozone, ultraviolet Station
- 01 High Air Station
- 01 Weather Doppler Radar Station
- 50 Hydrological Stations
- 95 Automatic Water Level Stations
- 06 Marine Stations
- 138 Automatic Rain Measuring Stations
- 34 River Water Salt Measuring Points
- 02 Environmental Monitoring Stations
- Etc...

WEATHER DOPPLER RADAR, AUTOMATIC METEOROLOGICAL STATION AND ENVIRONMENT STATION AT NHA BE



ĐÀI KHÍ TƯỢNG THUỶ VĂN KHU VỰC NAM BỘ
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Trạm radar Nhà Bè

INFORMATION EQUIPMENT SYSTEM, FORECASTING MODEL

- **COMPUTER SYSTEM:**

- ✓ 6 servers (CPU Xeon 4 cores);
- ✓ 2 HPC machines, each has 02 CPU Xeon 6 cores;
- ✓ Model calculator includes 16 calculating buttons;
- ✓ 13 servers are installed in provincial hydrometeorological centers.



APPLYING MODELS

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graph TD; A[APPLYING MODELS] --> B[Weather Forecasting Model]; A --> C[Hydrological Forecasting Model];
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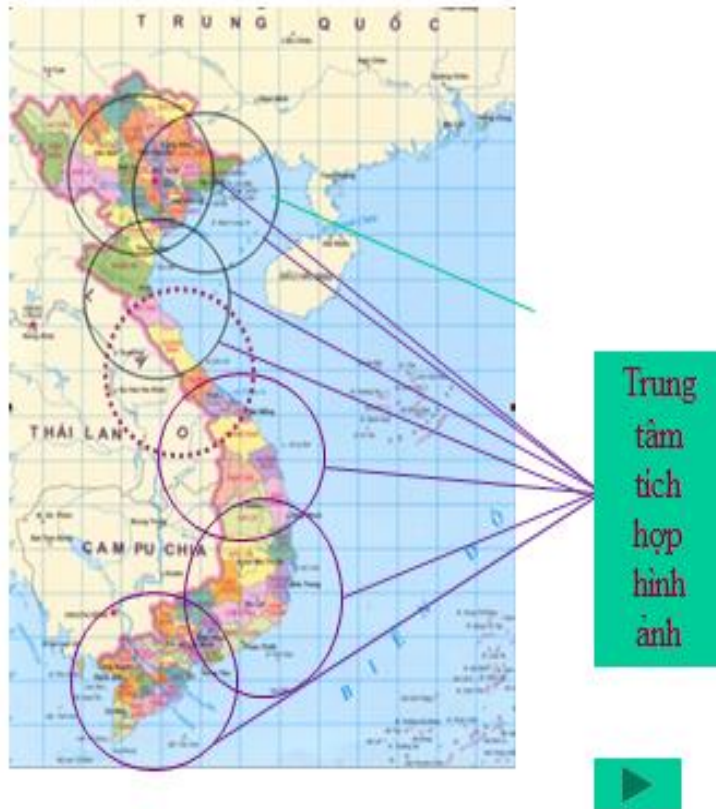
Weather Forecasting Model

- WRF model
- HRM model

Hydrological Forecasting Model

- MIKE 11
- DELF 3D
- HydroGIS
- DonaFlood Software

Hazardous weather warning system



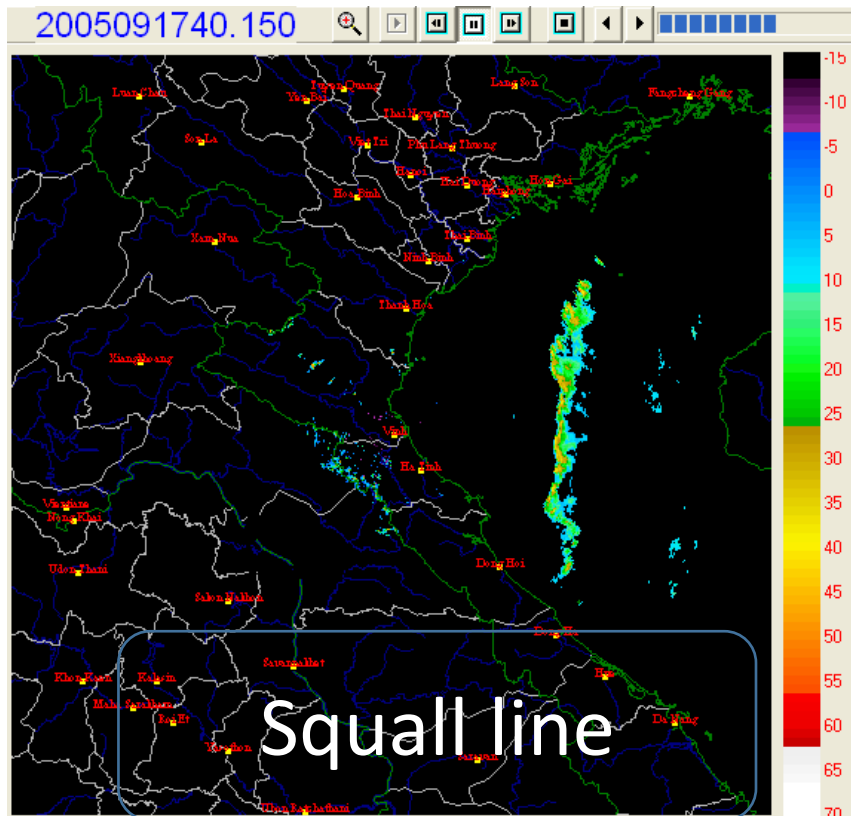
UPPER AIR STATION : 06

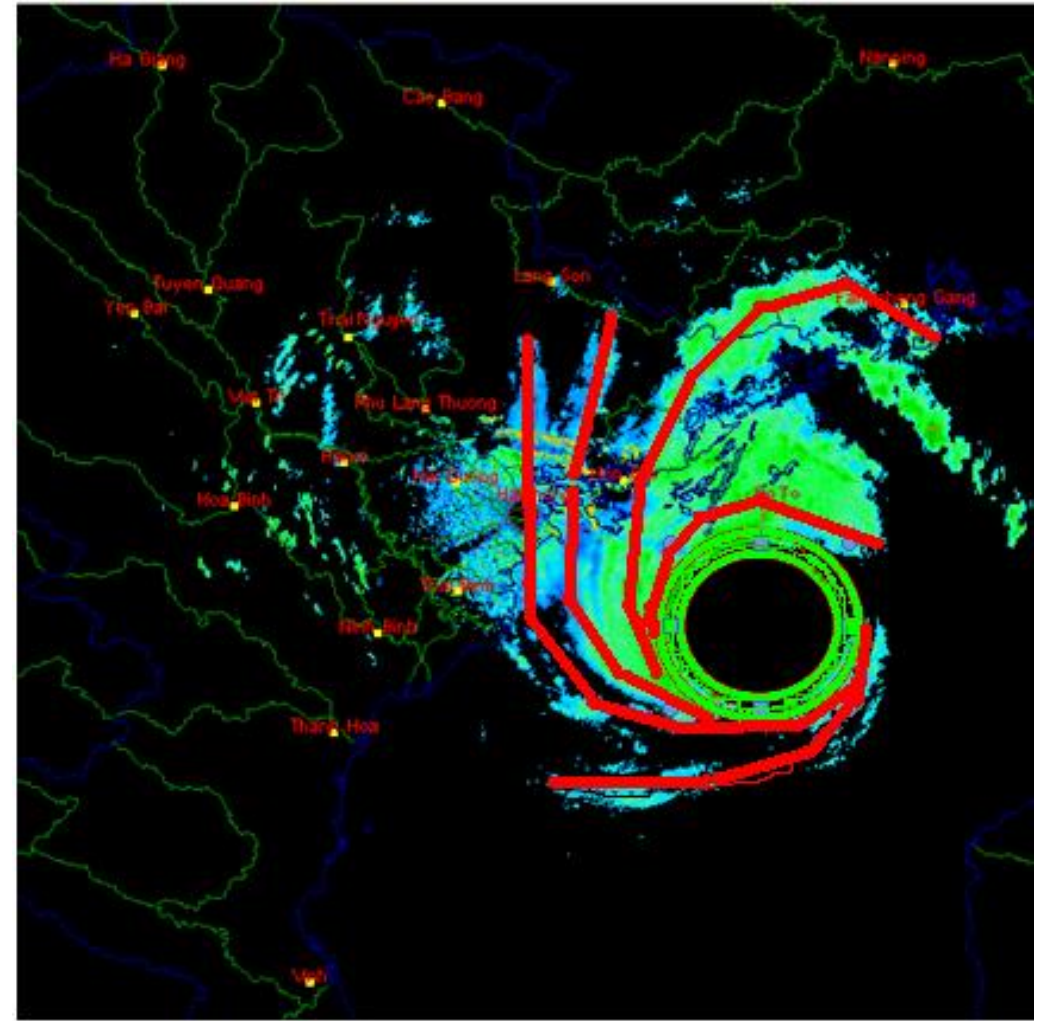
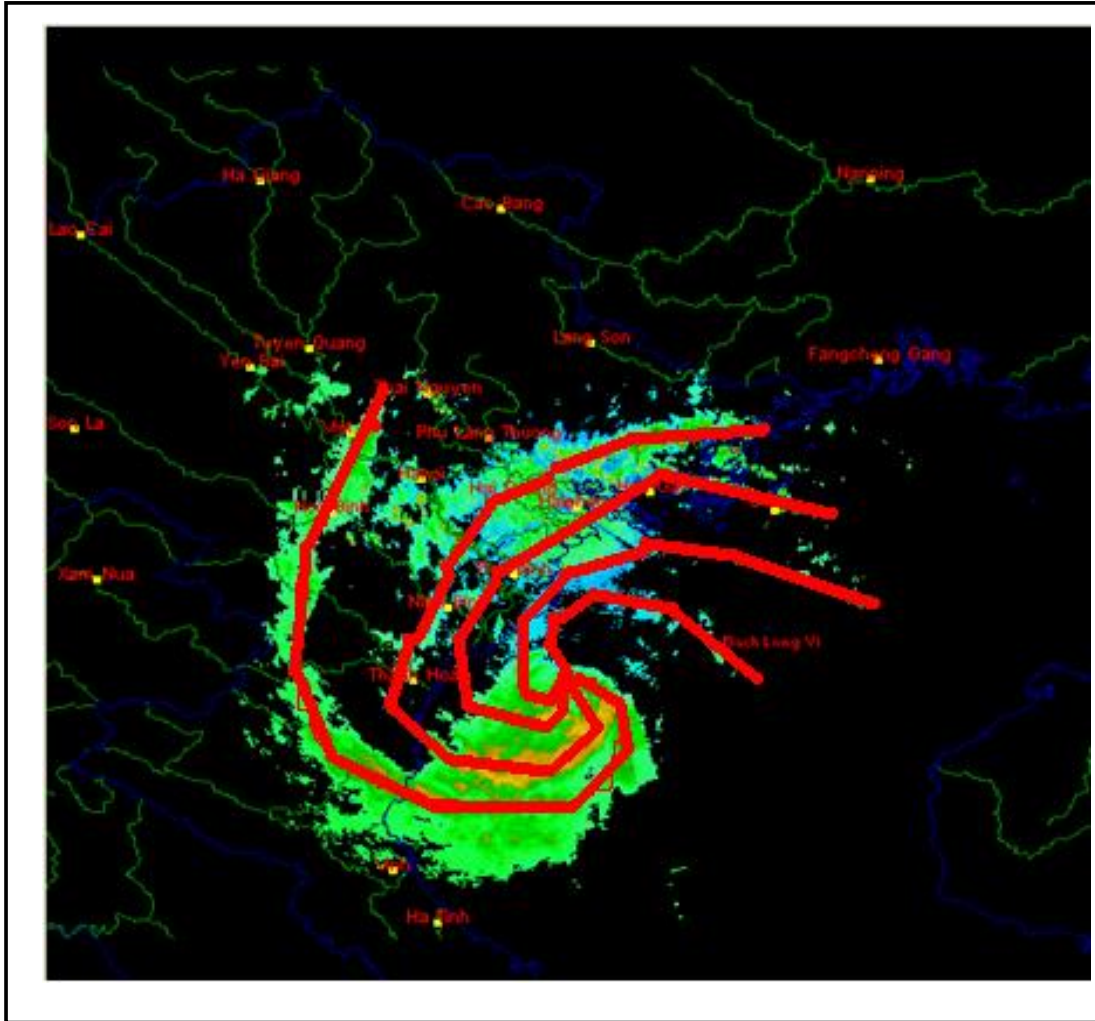
LIGHTNING DETECTOR: 17

HYDRO-METEOROLOGICAL

WEATHER RADAR NET WORK

TYPHOON FORECAST ANALYSIS BY DOPPLER WEATHER RADAR





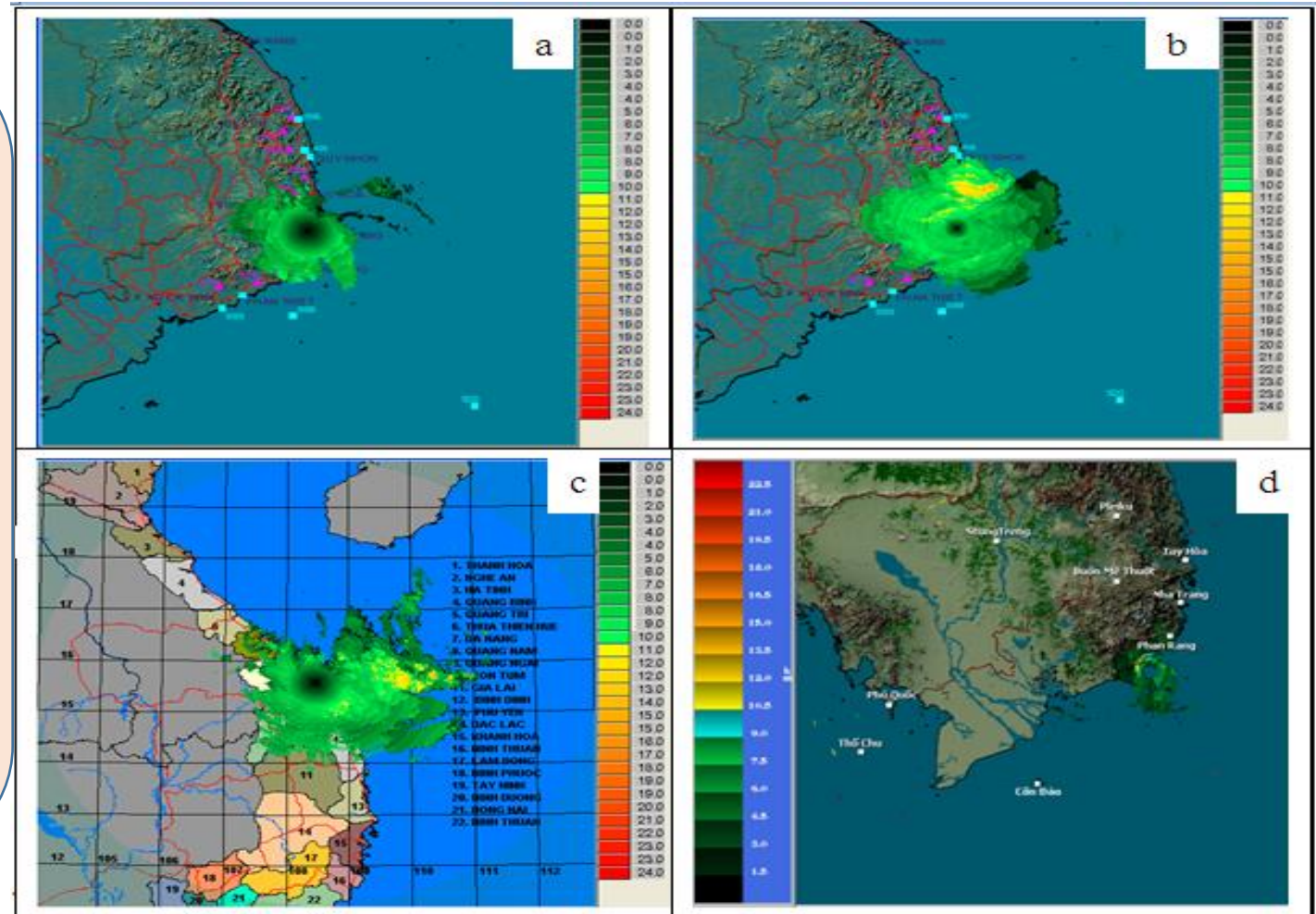
Spiral band

Height distribution of Spiral band

ETOP 10-15KM –Typhoon)

ETOP 7-10KM - Severe TS

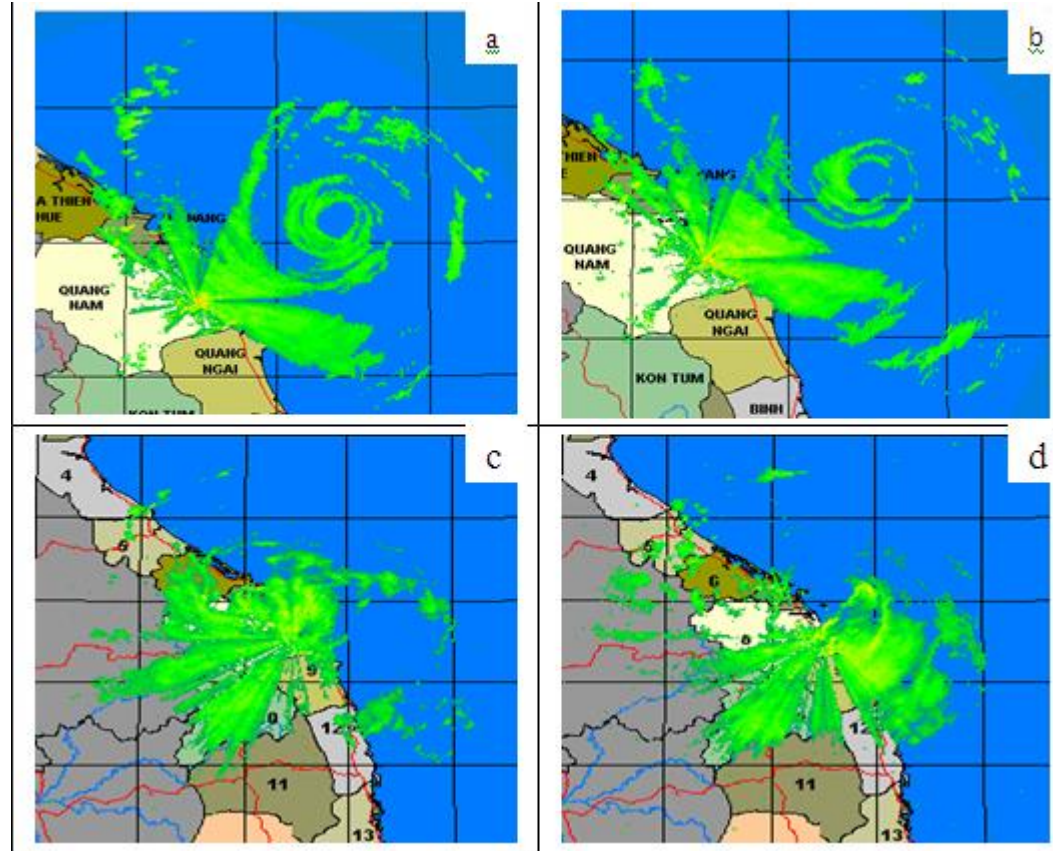
ETOP < 7KM - Tropical Storm



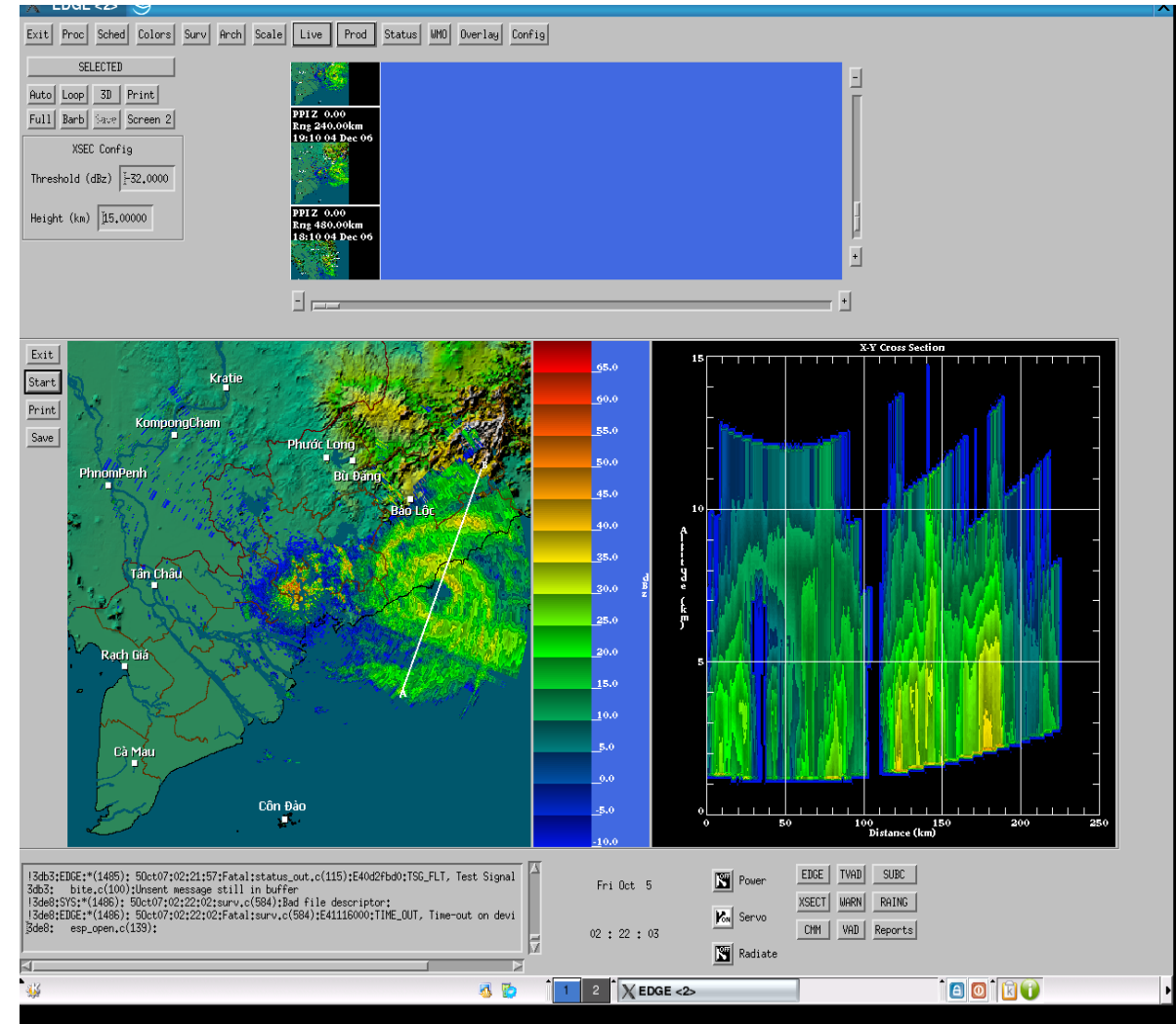
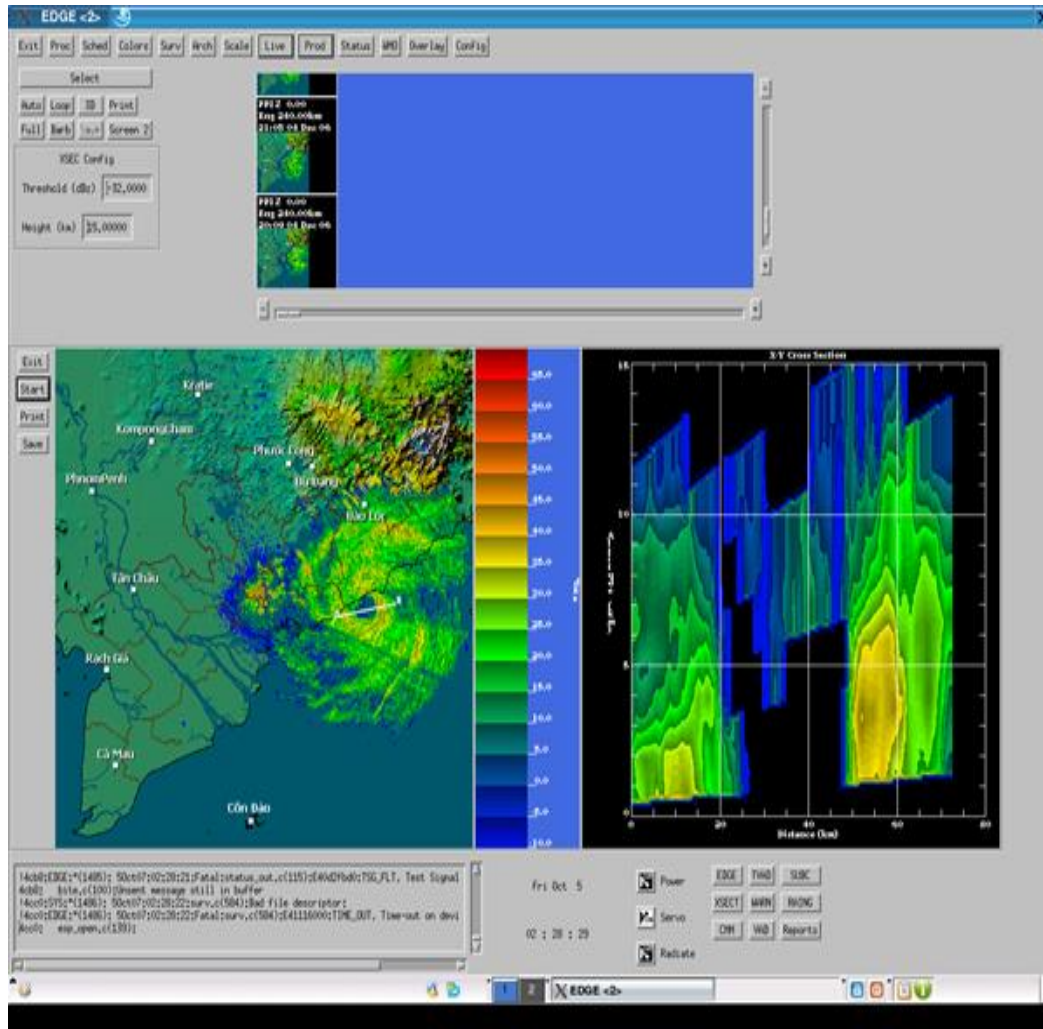
CLASSIFYING EYES WALL

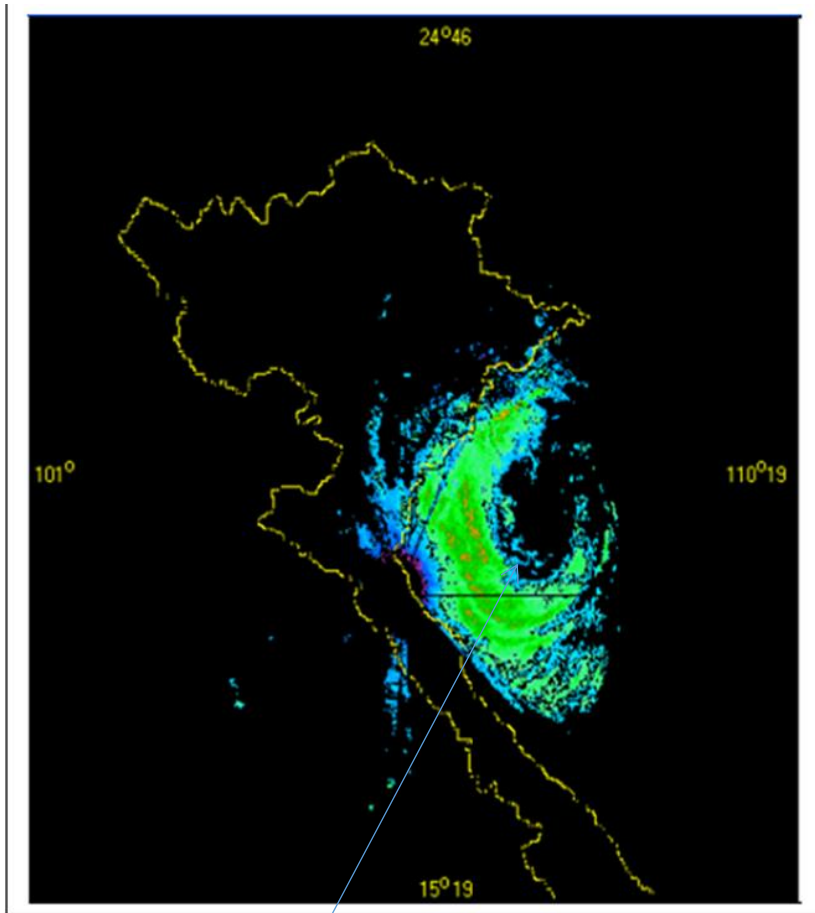
CLOSED

NOT CLOSED

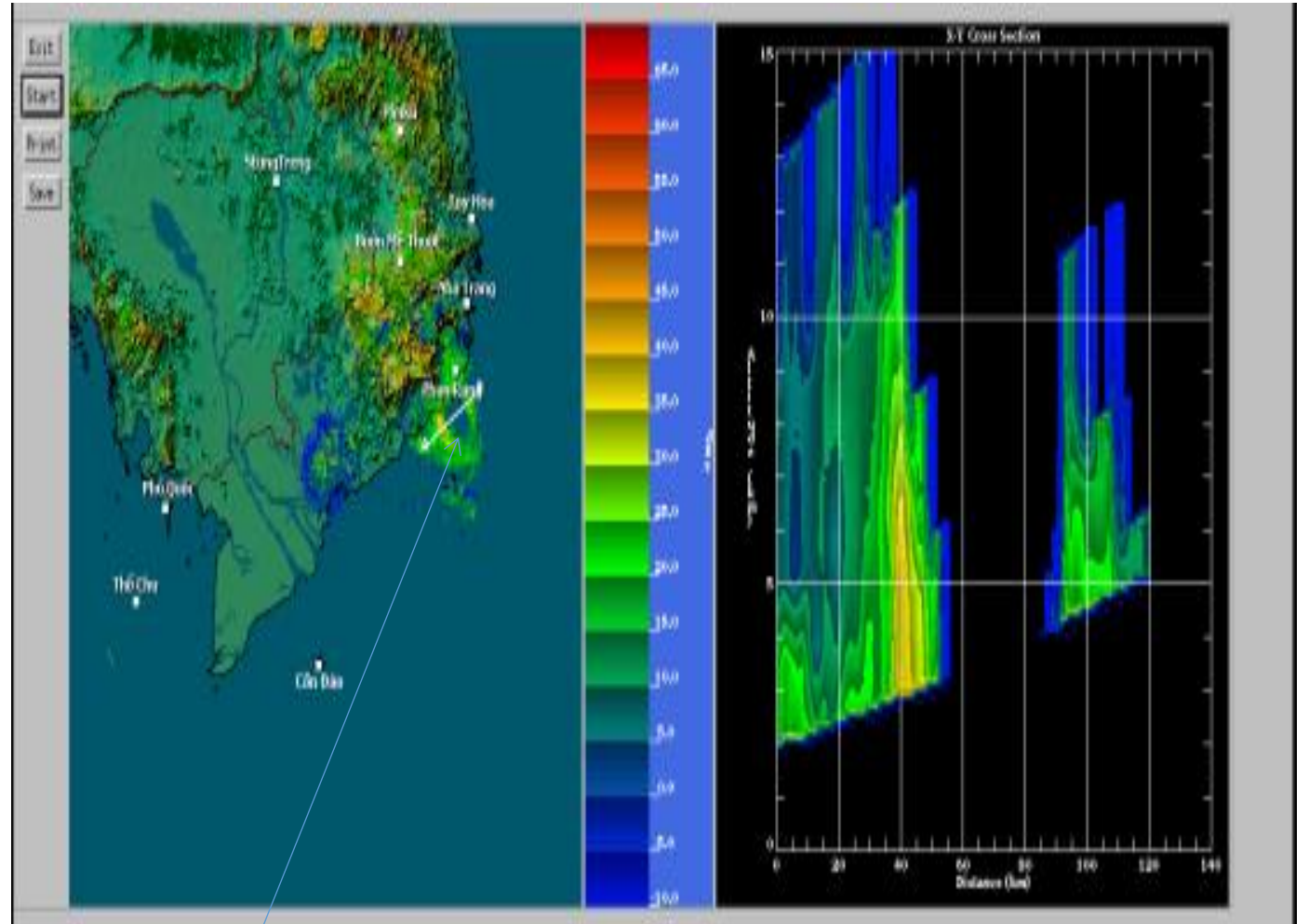


DISTRIBUTION OF EYES WALL AT DIFFERENT HIGHRS



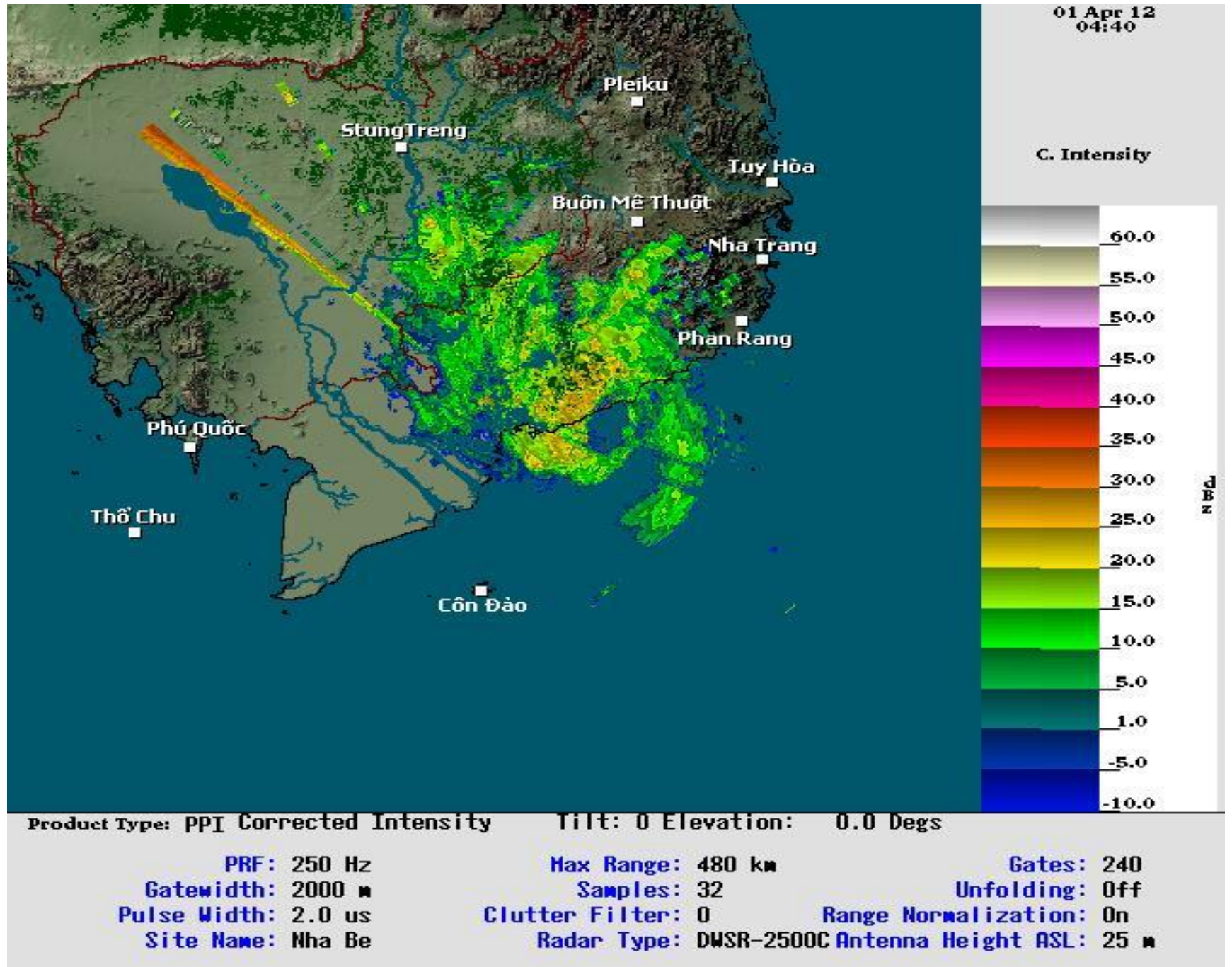


ELIP – NOT CLOSED

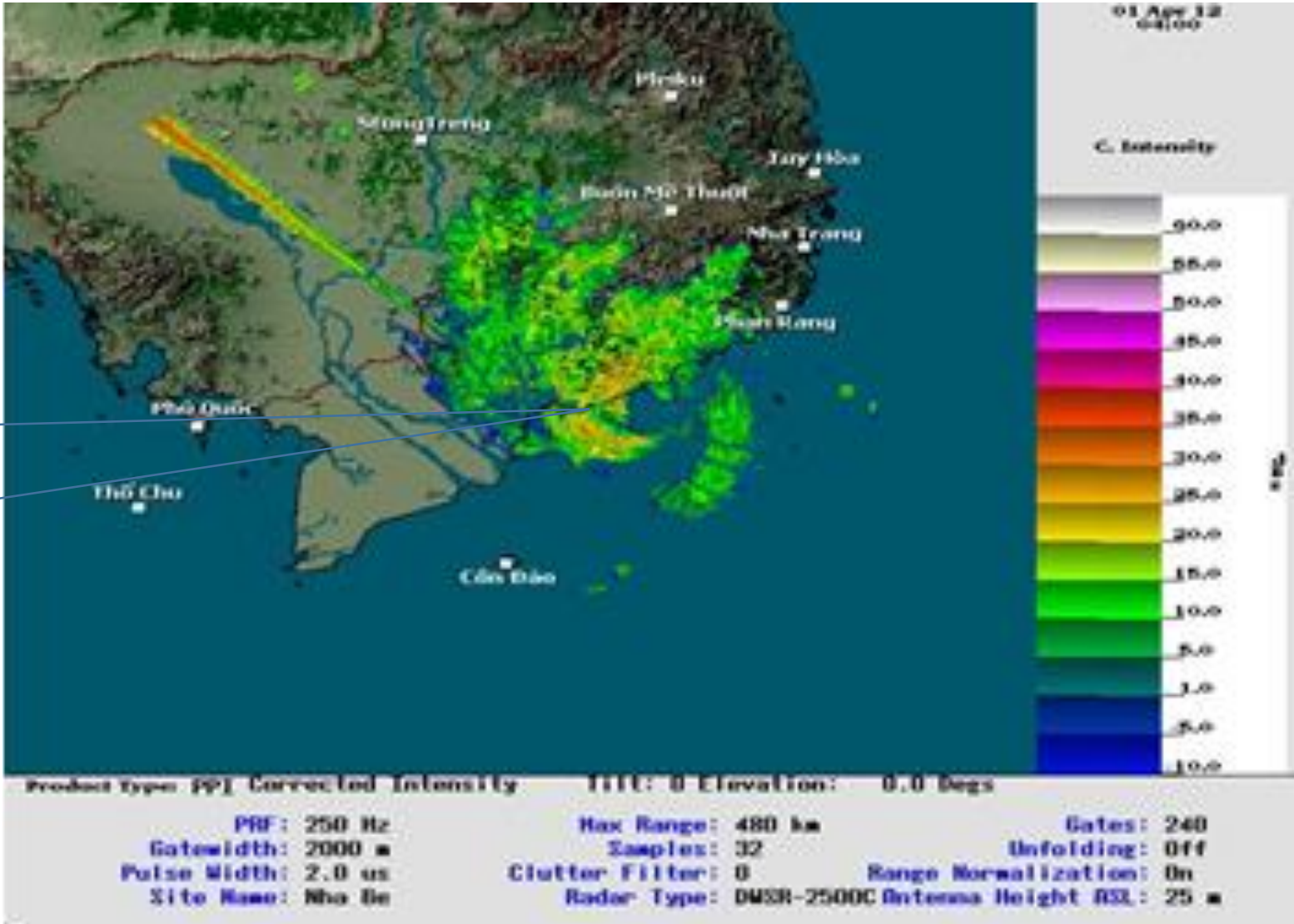


ELIP –CLOSED

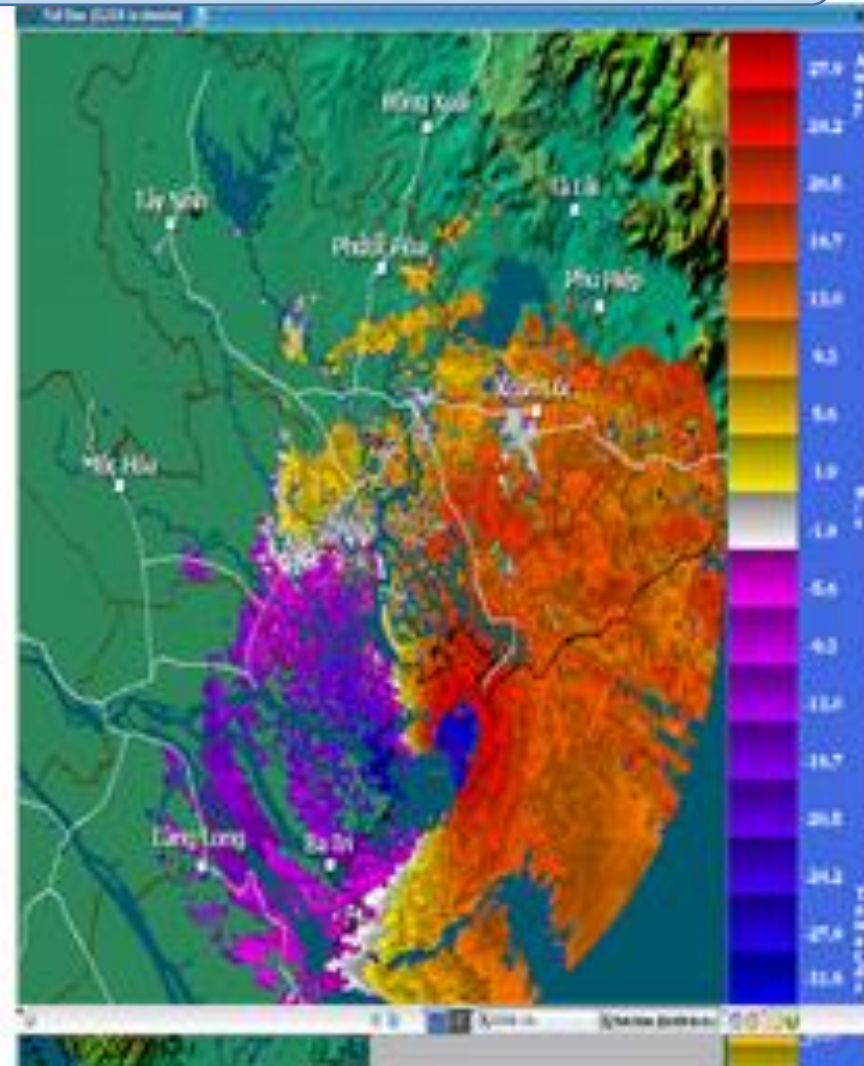
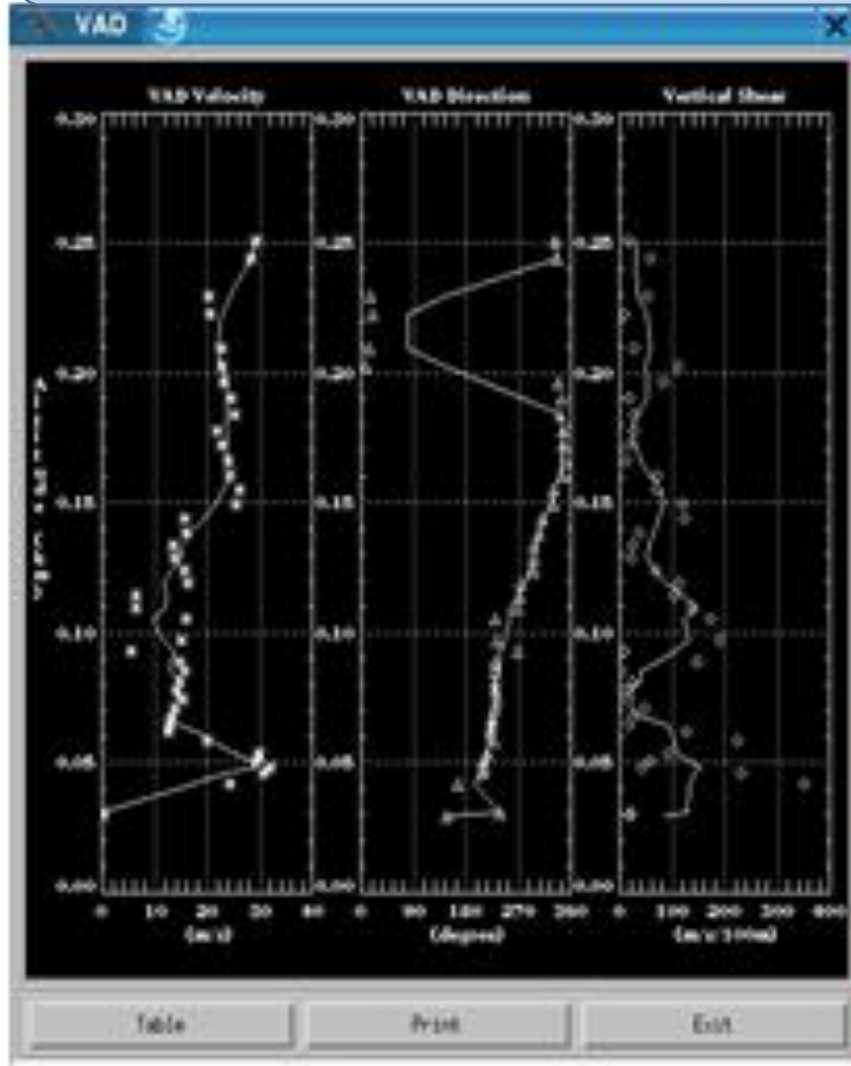
ELIP - CLOSED

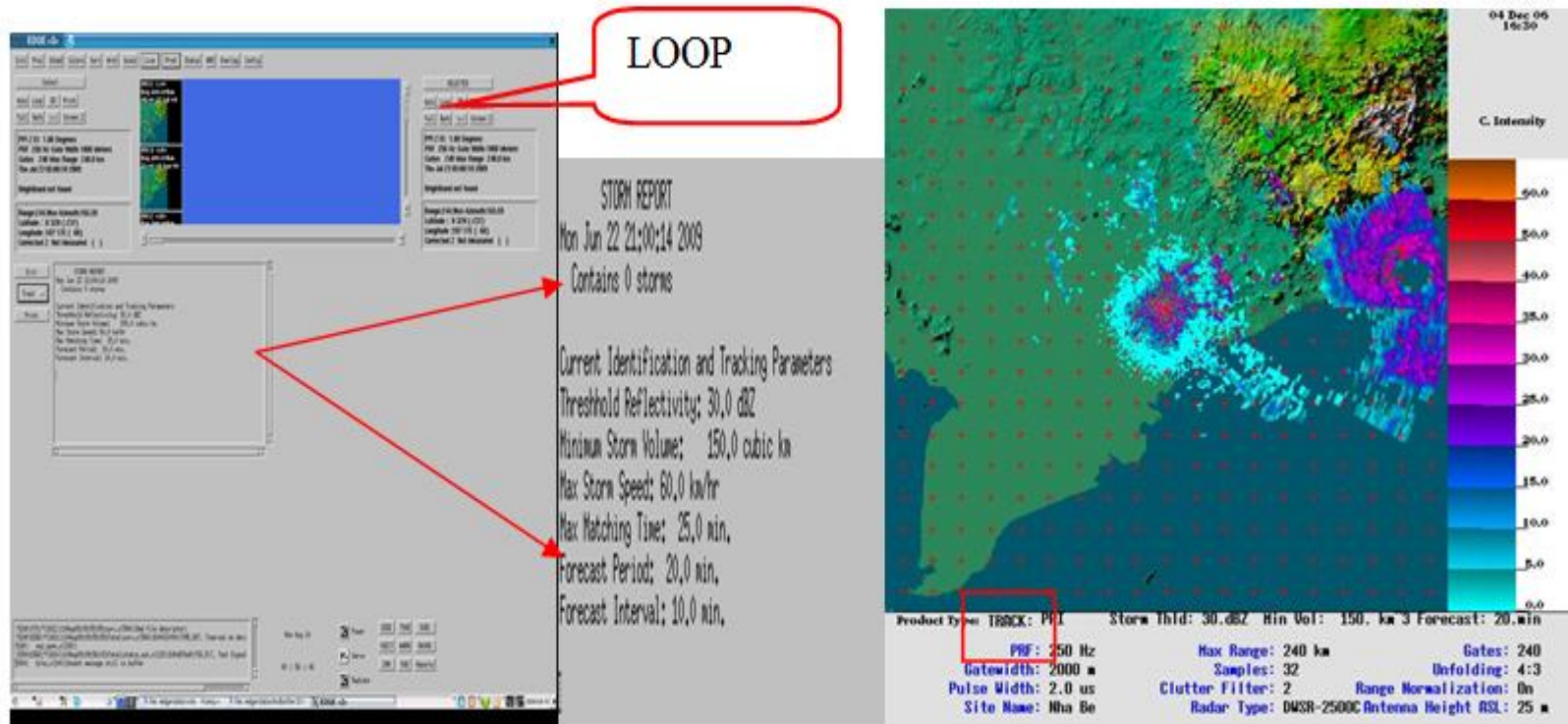


Strong
reflectivity

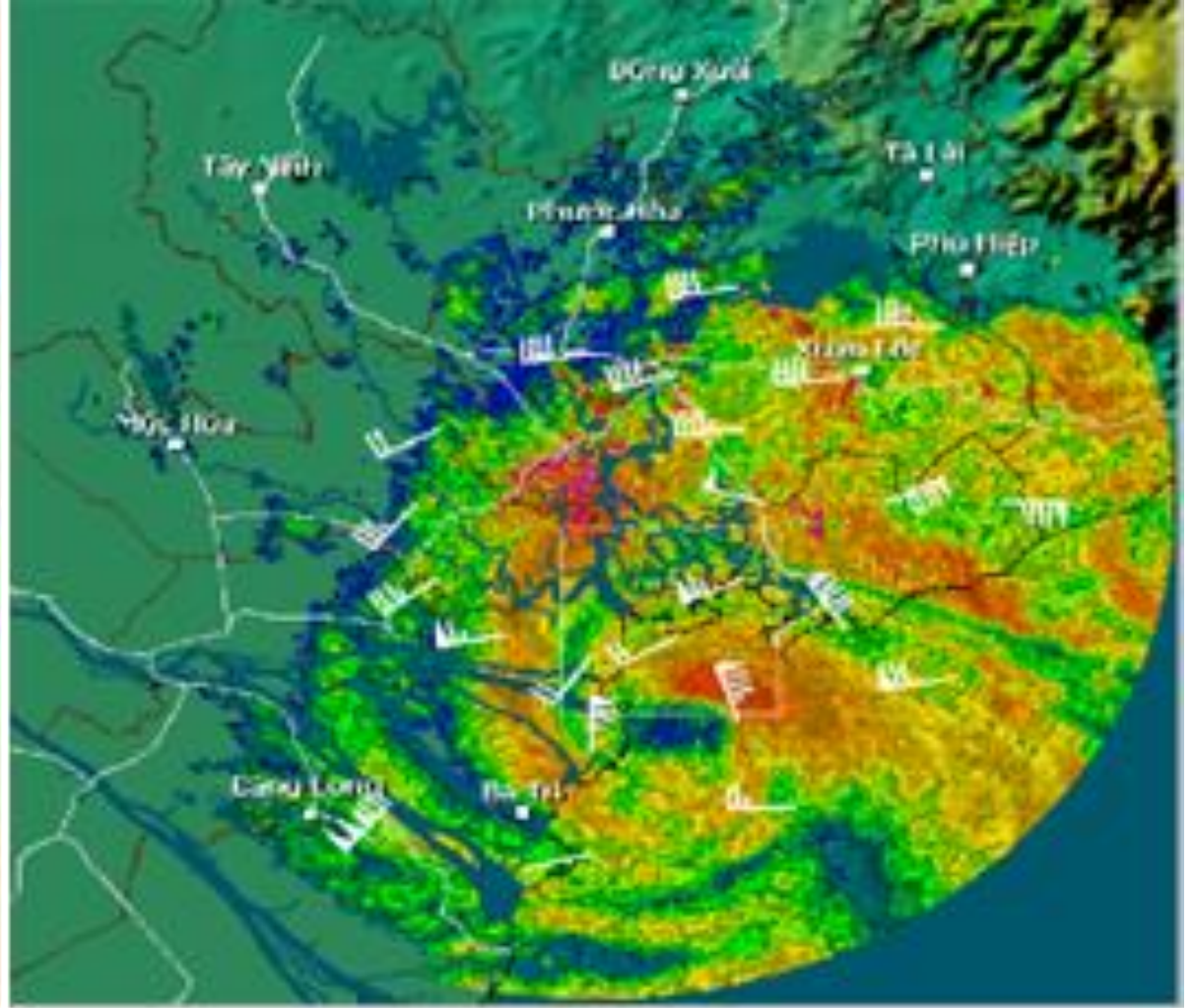
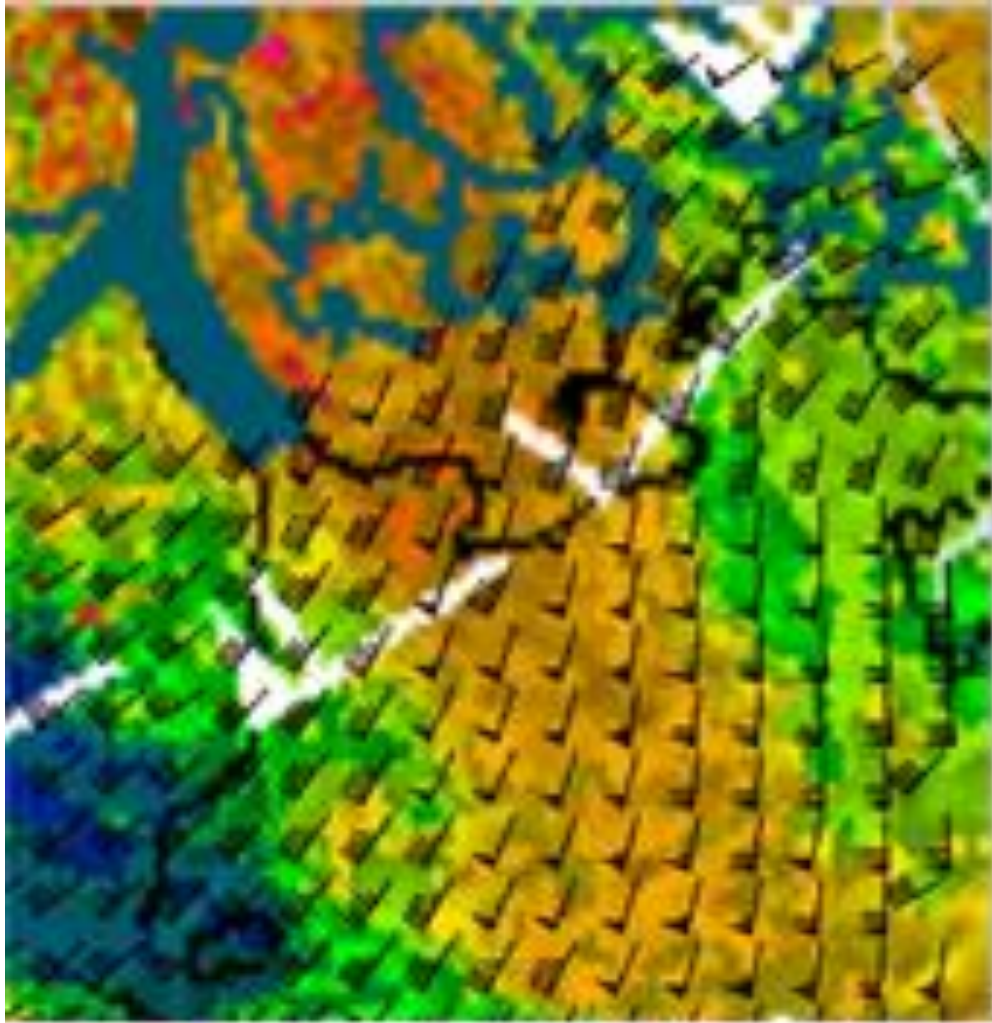


VELOCITY





TRACK function window (left) and TRACK product (right) to determine the speed and direction of storm movement



Conclusion

- The eye care specified by iterative methods based on Doppler weather radar maps information give good results when the eye of the storm has clearly formed.
- Method of determining the maximum hurricane wind speeds produces fast results when there is a combination of formula and reflectivity factor analysis on radar map such as reduction or increase in the reflectivity analysis, velocity Doppler parameters.
- Applying the formula to determine the direction and speed of movement of the storm is accordant only when the typhoon is in relatively stable movement. It will be difficult to adopt the formula in case storm movement direction is complicated.

The above method of analysis and calculation above are simple and easy to implement, get results fast, small errors. The selected radar tracking Hurricane is the right choice when the storm is on radar visibility.

It is helpful when the Typhoon near the radar , the Typhoon distance of more than 300km results in no good

Doppler products velocity displayed wind direction and radial speed is good when Typhoon distance 120km or shorter

Part 3: RECOMMENDATIONS

- Add more weather radar
- Combination with radar and model, upper air data
- Investing in automatic salt measuring station.
- Upgrade old weather radar stations



THANK YOU