THAI METEOROLOGICAL DEPARTMENT

MINISTRY OF DIGITAL ECONOMY AND SOCIETY

AI Empowering the Early Warning for All

AI applications and developments

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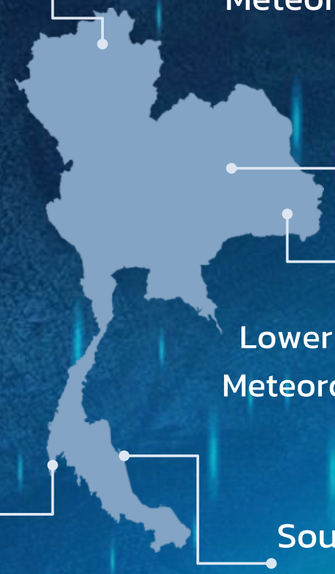
1.Develop into a high-performance organization

TMD Introduction

Headquarters

- Meteorological Observations Division
- Weather Forecast Division
- Meteorological Development Division
- Aeronautical Meteorology Division
- Earthquake Observations Division
- Meteorological Digital Services Division
- Meteorological Instruments Division
- Telecommunications Division
- Office of the Secretary

Regional Centers



- Northern Meteorological Center
- Upper Northeastern Meteorological Center
- Lower Northeastern Meteorological Center
- Southern-East Coast Meteorological Center
- Southern-West Coast Meteorological Center

Vision

"Aspiring to the excellence in meteorology at the international level"

Mission

- Develop into a high-performance organization
- Enhance data and forecasting capabilities to meet societal needs and respond to climate change
- Provide early warnings to protect the lives and property of the public
- Create economic value and deliver benefits to society
- Enhance credibility and public trust in meteorological operations and disaster warning systems for broad acceptance.

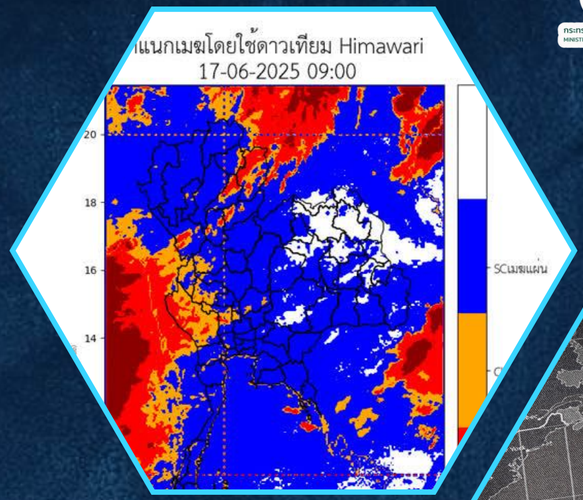
AI Revolution in Weather Forecast

Short-range forecast (1-10 Days)

- Using AI to analyze radar data for short-range rainfall forecasting
- Using Machine Learning to analyze satellite data for monitoring cloud and storm development
- Disaster alerts are automatically distributed via applications and online channels

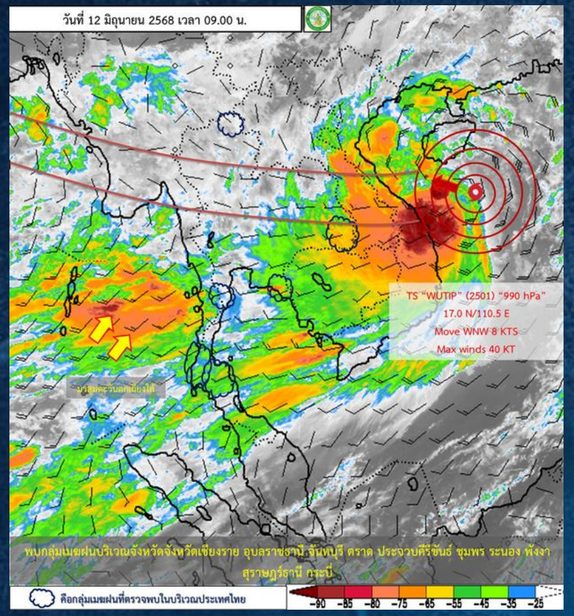
Long-range forecast (monthly/seasonal)

- Use AI to analyze monthly weather trends
- Assess risks of drought and flooding
- Forecast rainfall amounts for the agricultural sector

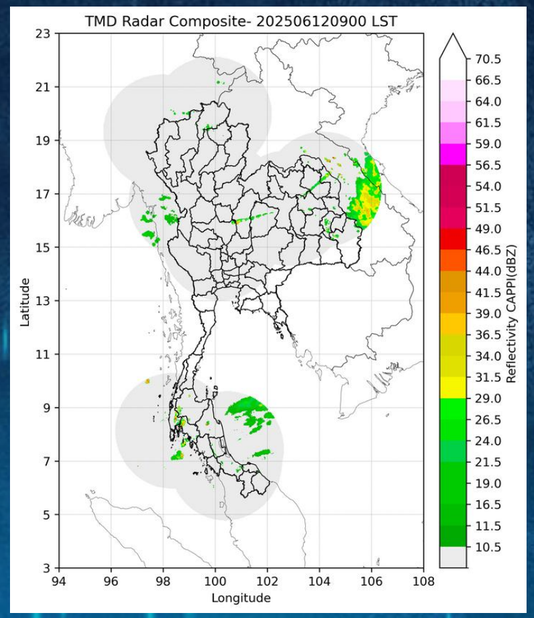


AI Applications in Disaster Detection

SATELLITE IMAGERY ANALYSIS



RADAR DATA PROCESSING



MULTI-SENSOR FUSION

Use AI to integrate data from various, such as satellite, radar, and weather stations, to display combined results.

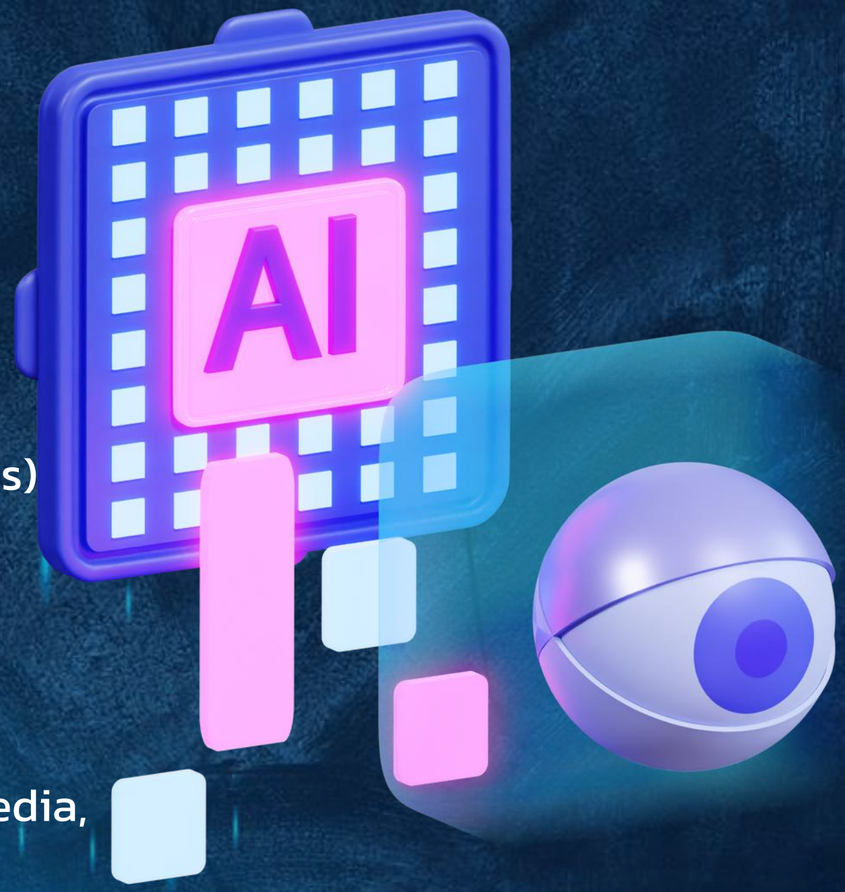
Early Warning Systems

Enhanced Risk Assessment

- Real-world scenario medeling
- Used to help forecast potential impacts
- Multi-hazard integration (flood, droughts, storms, heatwaves)

Alert Dissemination

- Analyze risk areas to deliver targeted alerts
- Customize warning messages based on target audiences
- Provide alerts through various channels (SMS, App, Social Media, Cell Broadcast



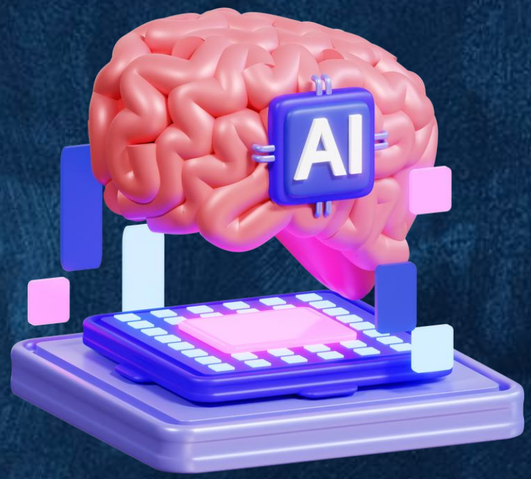
AI-driven data processing

Data collection

- Collect data from real-time sources

AI Processing

- Automatic data quality filtering
- Pattern Recognition and Anomaly Detection
- Development of predictive modeling



Output Generation

- Automatic report generation
- Interactive Visualization
- API Services for external systems

Expected Outcomes from the Application of AI in Meteorological work

- Improve the accuracy of weather forecasts and severe event prediction
- Reduce data processing time and enable faster issuance of warnings
- Help the public and relevant agencies prepare in a timely manner
- Expand access to real-time forecast and warning data through user-friendly API and interactive visualization systems
- Support location-specific and target-group forecasting, such as for agriculture, aviation, and disaster management
- Enhance resource management and disaster preparedness through in-depth data and predictive analytics

Thailand’s preparedness

Infrastructure

- Weather radar network
- Surface/automatic weather stations
- Computing Infrastructure
- High-speed internet
- Software & Licensing

Thailand’s Preparedness

Personnel and Collaboration

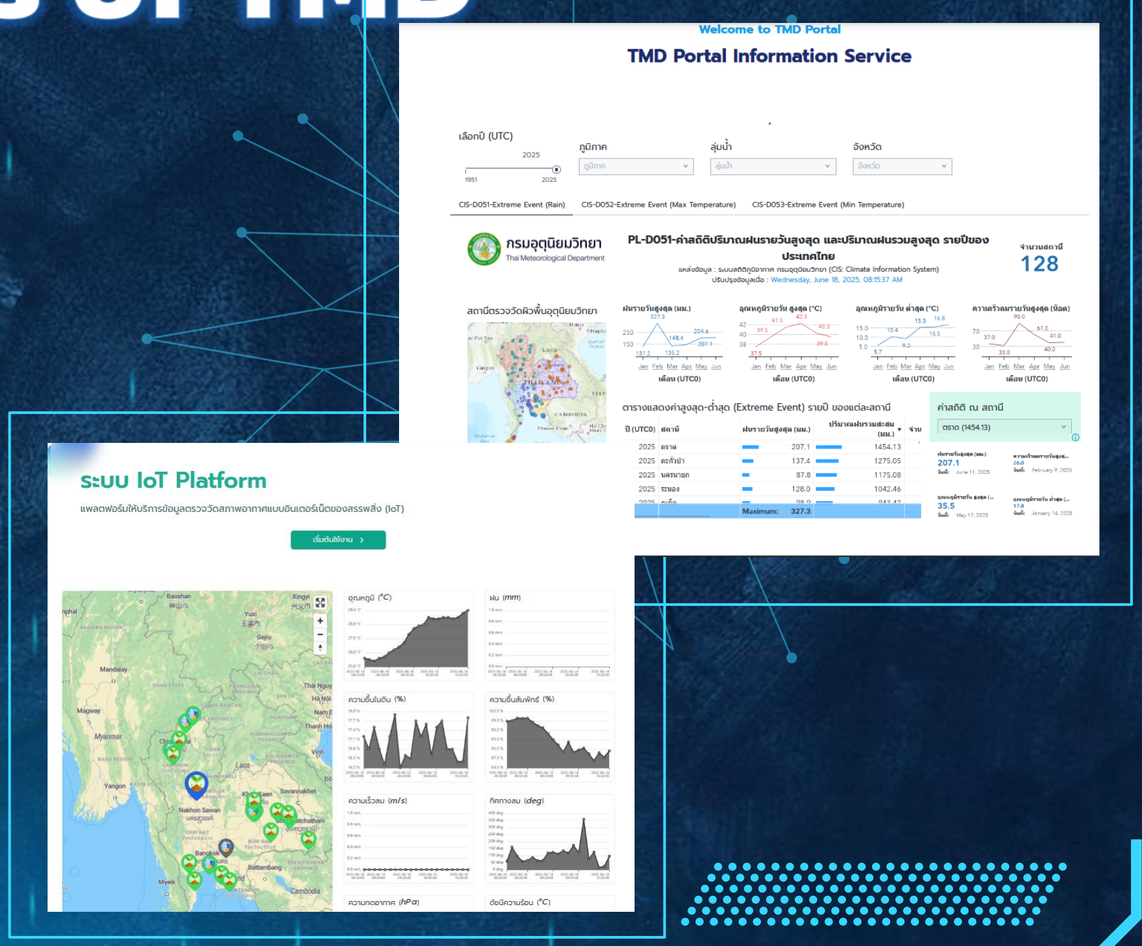
- Meteorologist with a technical background
- IT specialists and data analysts
- Inter-agency collaboration for research and knowledge development

Current AI projects of TMD

The Climate Model Improvement Project Using Artificial Intelligence Applications for Thailand

Current AI projects of TMD

Using AI to improve the dissemination of meteorological information, making it faster, easier to understand, and accessible to all groups of people.



AI collaboration of the TMD today

TMD participates in the Alert Development Projects with cell broadcast system.

TMD provides weather and earthquake related disaster information to relevant agencies responsible for issuing alerts.

AI-Powered Early Warning for All

We are committed to developing a comprehensive and accessible early warning system
for every one, every area, leaving no one behind.

With advanced AI innovation in meteorology,
we are ready to transfer knowledge and technology to regional areas to strengthen the security and safely of all people.

Empowering Thailand’s future through AI-driven early warning

Q & A

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Thank You!

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