Challenges for Climate Change Risk Reduction with Cutting-Edge Technologies in Weather and Climate Services

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Data Strategy and Corporate Sustainability
Weathernews Inc. (WNI)

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Introduction
January 1970, an explosive low-pressure system hit the port of Onahama, Japan, and lives of 15 crew on the vessel has lost due to an “Undelivered” warning information.

“If there had been really useful weather information, maybe this accident could have been prevented.”

Weathernews Inc. was established with a sense of responsibility and strong will of company founder Mr. Hiro Ishibashi in 1986.

Since then, our “Risk Communication service” have expanded to cover all types of business and our daily lives.
Weathernews Inc. (WNI) in Brief

**Global Operation Network** Supporting 24 x 7, from 32 offices in 21 countries

- Oklahoma Operations Center
- Copenhagen Operations Center
- Amsterdam Operations Center
- Athens Operations Sub-Center
- Yangon Operations Center
- Manila Operations Center
- Tokyo Global Operations Center

Sales in 44 areas of global market, with 1,100+ employees (including 200 Certified Forecasters & 250 IT Experts)
- 2,500+ BtoB customers in 50 countries
- 2,000,000+ BtoS “Supporters” 180,000 Weather Reports / Day

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## Global Market

**Shipping:** Over 10,000 Vessels worldwide under our service in a year

**Aviation:** Over 13,000 flights a day for safety, comfortable & economical flight

**Energy:** Safe and stable supply and distribution of electric & gas power

**Climate:** Risk analysis and support corporate management for climate change

### Sea Planning
- Shipping
- Offshore Energy
- Sea Logistics
- Offshore & Near Sea
- Fishery

### Land Planning
- Road Management
- Railway
- Transportation
- Facility Management
- Local Government
- Event Management
- Construction
- River Administration
- Telecommunications
- Manufacturing Management
- Dynamic Climate Change
- Terrestrial Phenomena
- Air Quality Analysis

### Environment Planning
- Energy
- Retailer
- Agriculture
- Dam Operation Management

### Sky Planning
- Aviation
- Broadcasting
- Climate tech Planning

### Mobile / Internet Planning
- Mobile
- Internet
- Travel
- Wellness
- Flower
- Weather
- Farm
- Disaster Reduction
- Star
- Photo
- Space Weather

### Sports Planning
- Sports
- Football
- Motor Sports
- Boat
- Sports Festival
- Baseball
- Sky Sports
- Mountain
Public Private Engagement (PPE)

Legal Framework for Meteorological Services in Japan - Meteorological Service Act - (1952)

1993: Revised

Enhancement of Public-Private Partnership
- Establishment of an authorized organization for dissemination of meteorological data to the private sector
- Establishment of “certified meteorological forecasters” system
- Authorization of Public Weather Forecast by the Private Sector

| Japan Meteorological Agency | NNN weathernews
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<tr>
<td>Public Weather Platform</td>
<td>Always WITH you!</td>
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<tr>
<td>Weather Forecast Warning</td>
<td>Your Weather Information Exchange Platform (interactive communication)</td>
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<td>Basic Observation</td>
<td>Weather Forecast Solutions for Risks Warning Dissemination</td>
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<td>Original Obs. for Specific Services</td>
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Our Service

Input Observation Data
- Original Observation
  - Observation + Eye-Servation (観測)
  - Observation (観測) + Eye-Servation (観測)
  - KN-Expert System
  - KN-Expert System with Climate Models
  - KN-Expert System for Climate Models

Ensemble Analysis
- Analysis (分析) + Forecast (予測)
  - Analysis (分析) + Forecast (予測)
  - Analysis (分析) + Forecast (予測)
  - Analysis (分析) + Forecast (予測)
  - Analysis (分析) + Forecast (予測)

High Resolution Forecast
- Risk Communication
  - Risk Communication
  - Risk Communication
  - Risk Communication
  - Risk Communication

Weather Report (from users)
- Public Observation
  - Public Observation
  - Public Observation
  - Public Observation
  - Public Observation

Service Review & Feedback
- Service Review & Feedback
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  - Service Review & Feedback

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Challenges for Climate Change Adaptation
BOSAI framework for Disaster Risk Reduction

Deliver to the End User

SELF Support
Knowledge and Tools to help oneself

User - Centered Platform
MUTUAL Support
Close community Help neighbors

PPE & PPP for DRR
PUBLIC Support
National and Local Governments

Private Sector
Private Sector plays a key role in organizing and disseminating the information on disaster and warning to end-users.
WNI invests and attempts to building an observation network with the same level of density as Japan in the designated area indicated in map.

WNI will plan to set a station in each grid (at least) with the combination of existing public and academic stations to deliver advanced weather information service of disaster mitigation.
The EAGLE radar is a new meteorological radar that performs 3D observation of 50-km periphery in 30 seconds.

The latest X-band meteorological radar "EAGLE Radar" is installed in Hanoi, Viet Nam, in May 2023 within the Voluntary Cooperation Programme (VCP) of WMO in cooperation with the Japan Meteorological Agency (JMA).

With higher-resolution observation data, WNI and the Viet Nam Meteorological and Hydrological Administration (VNMHA) will contribute to the enhancement of resilience by improving the accuracy of weather forecasts and decision-making regarding the issuance of warnings.

PPP: The EAGLE Radar for VCP (Voluntary Cooperation Programme of WMO)
PPP: AI & Deep Learning Capability

- Weather Reports From Users
- Auto-Detection, Prediction & Classification by analyzing the image
- Cloud Classification
- Enhance & Complement monitoring operation
- Camera
- Detect the signs of severe phenomena & Transcribe

- Computer Vision
- Multi-Architecture
- Meteorology
- Physics
- Machine Learning
- Deep Learning

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PPP: AI Chatbot Service

Customized information from AI Chatbot/Government

Collecting and organizing information from citizens (victims)

- Familiar communication tool helps to get information easily
- Optimize the communication between government and citizen
- Share the information of supplies and evacuation immediately
- Grasp the situation of damage/recovery accurately
- Record and analyze of losses & damages after the disaster
Weathernews is joining the “SIP” national program led by the Council for Science, Technology and Innovation (CSTI) of the Japanese Government and developing “AI Chatbot” system for disaster prevention with the collaboration of National Research Institute for Earth Science and Disaster Resilience (NIED), National Institute of Information and Communications Technology (NICT) communicating through the mobile app platform of LINE.

In collaborative project with UNESCO, Weathernews attempts to contribute to disaster prevention in East Africa nations by providing and collecting information related to disasters through mutual communication with users by utilizing the “AI” language analysis and mobile app platform as the fundamental Early Warning System. This original system is totally adaptable at economical cost, in the any country, on any communication tool in the world.
PPP: Chatbot Model Case in Japan

Shiiba Village, Miyazaki, Japan
(Population: 2,300)
Typhoon No.14, SEP 14th-21st 2022

- 74 Reports have been made and shared by citizens
- Created a hazard map in real-time, and grasped the area in damage
- All governmental organizations shared and used the same information
- Found the area with bad reception and power outage (no reports has been made on the map)
- Even a small village without enough resources and infrastructure, collaboration of Public, Private & citizens and technology/tool may help lives and properties of people
Challenges for Climate Change Mitigation
Examples of Climate Change Mitigation Services

► **CO2 Reduction by Optimum Ship Routing (OSR)**

WNI provides global ship routing services which optimize both engine speed and fuel consumption. Along with safety support services, WNI is challenging in monitoring and visualizing CO₂ reduction, and in fact, the Optimum Ship Routing service has contributed to the reduction of 2.8 million MT of CO₂ from June 2018 to May 2019.

► **Minimize Food Waste with Supply/Demand Forecast**

WNI’s demand and supply planning support service is also utilized in the distribution and retail markets. Especially for an issue of food waste, predicting future demand with weather/climate risk analysis can avoid excess production waste in the supply chain.
Providing “Energy Resilience Service” for power company with site specific power demand/supply forecast & risk analysis.
Full Support Energy Services

✓ High-precision, local weather forecasts
✓ Power demand prediction
✓ High level support, quality control & digital integration
Services for Power Grid / Social Infrastructure

✓ Grid line weather monitoring & forecasting
✓ Focused Grid Line Capacity Trend Monitoring & Forecasting
✓ Regional Grid Demand & Renewable power prediction

EASY-TO-USE DLR TRACKING AND SIMULATION

Through our online dashboard, you can easily access grid line weather data, real time DLR ratings (stationary and transient for 5, 10 and 20 minutes), and create forecasted simulations of transient DLR (inputing specific date, time and power forecast).
The global push for the adoption of renewable energy for the achievement of a sustainable society is causing more companies to advance into the offshore wind power business, which in turn is resulting in an increase in demand for meteorological information geared specifically toward the business. WNI provides the service for offshore wind farm with the combination of experiences from maritime and energy industries.
Total Support for Energy Resilience

Our expertise is based on econometric modeling of the activity, taking into account weather factors, calendar, and markets. Our recommendations help industries to make the best decisions for building / improving the energy resilience.

Observation Data  Business Impact  Nowcast  Risk Analysis
Historical Data  Demand / Supply  Forecast (Short Term)  Operation Support
Analysis Data  Market Trends  Forecast (Long Term)  Optimization
Conclusion: Challenges and Opportunities

1. Advanced and sustainable observation & monitoring and effective data sharing / utilization based on the efficient PPE/PPP framework are required for enhancement of new values in weather & climate services for the climate change.

2. Utilizing the cutting-edge technologies and user feedback through the communication lead to strengthening the social resilience for extreme weather and natural disasters.

3. Innovative weather & climate service might optimize the power management (demand & supply) and support the energy resilience of the society.
Our dream is to be the Weather Information Platform to reduce the weather and climate risk for 8 billion people living in the world. We hope, a combination of traditional scientific approach and innovative cutting-edge technologies based on the appropriate mechanism for PPE/PPP will enhance and maximize the contribution of Weather and Climate Enterprise to save the people and society.

Thank you

https://global.weathernews.com/

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