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DISASTER MONITORING AND ANALYSIS SYSTEM USING A NEW JMA DISASTER PREVENTION INFORMATION XML FORMAT

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The Japan Meteorological Agency (JMA) has delivered the information of every Disaster Prevention Information (DPI) on each of weather warning, tidal wave warning and earthquake information, etc. up to now, which are different in format by their respective information. Previous DPI was delivered by fax and low-speed communication line, such as a JMA telegram form, which was not effective. Recently, JMA has decided to deliver all DPI data in a new JMA Disaster Prevention Information XML (DPI XML) format to users, mainly local governments, which is more detailed to suit our highly information-oriented modern society and is more effectively advanced. The XML format is a general format for data delivery, transformation and storage, so it is expected to enable monitoring of DPI data and analysis by GIS software.

We have developed a new system to utilize this JMA DPI XML format using a web-based interface and Geographic Information Systems (GIS) framework. The present system is a real-time processing system for JMA DPI XML data. The PDI XML format is a general format, so it is not easy to directly show even a scene displaying typhoon information on any kind of browser or software. First, we have developed a web-based display system on Google Map using Google Map API. Figure 1 shows a scene of typhoon information in DPI XML format on Google Map from JMA, which the display system is processed under JavaScript through an Ajax frame. If users implement the present comportment of JavaScript into their PC, they are able to monitor DPI XML data. This is a low-cost and efficient system to monitor hazard information quickly. Figure 2 shows a scene of earthquake information in a GIS shapefile converted from DPI XML format. Conversion of DPI XML format to shapefile format is processed under java and Perl. A shapefile format is available for almost all GIS software. Also, other disaster information such as a local hazard map could be integrated with the DPI shapefile on the GIS system for use of individual clients. Several basic DPI XML formats such as typhoon information, weather warning, tidal wave warning and earthquake information are already available for a web-based monitor system and a GIS system.

We expect there will be several types of users of this system, including local governments and commercial developers. The first type of users are simple, who use only browsers for monitoring DPI XML format data, such as the earthquake information shown in Figure 2. After receiving DPI XML data on several disasters via internet from the JMA or Japan Meteorological Business Support Center (JMBSC), they can quickly monitor various scenes in browsers. It is not difficult to monitor in their PC by implementing the JavaScript component kit received from our laboratory. The second type is users who are able to use GIS software in their office. They can monitor various scenes in shapefile converted from DPI XML data on a GIS framework. The converting tool from DPI XML data to shapefile is also available from our laboratory website. Using shapefile enables a much greater variety of uses of DPI XML data. For example, the high resolution ortho images integrated with rainfall data by DPI XML data on a GIS framework are quite useful for estimating flood damage in regions. As additional data, Digital Elevation Models (DEM), Digital Surface Model (DSM), 1:2500 digital topographic maps from the Geographical Survey Institute (GSI), and ward area maps of local governments could be integrated with DPI XML data.

In the future, various advices by local governments or other users are necessary to improve the present system. Especially, local hazard maps are quite important because they include various inundation zones due to past floods.

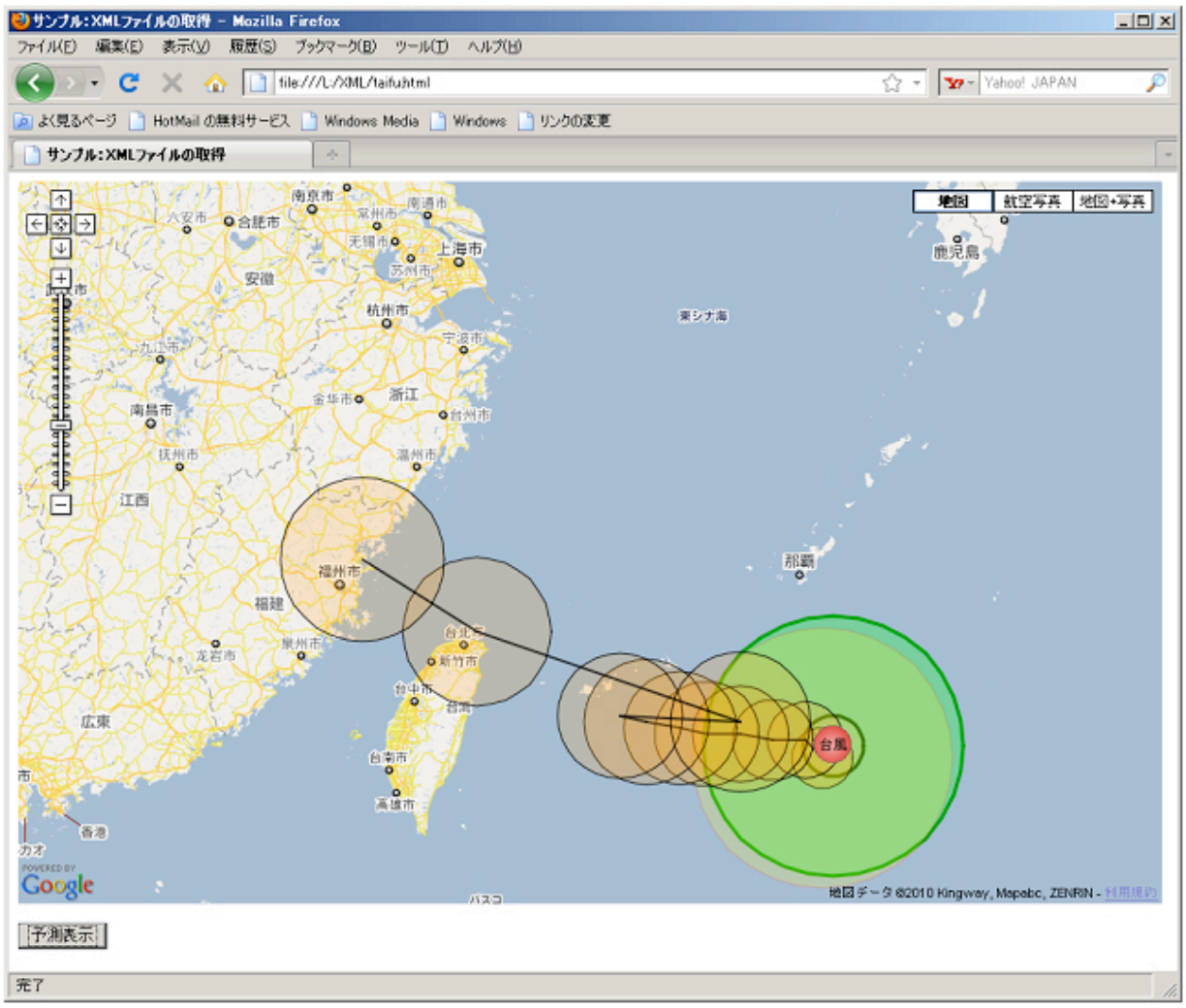

Figure 1 Typhoon scene on Google Map

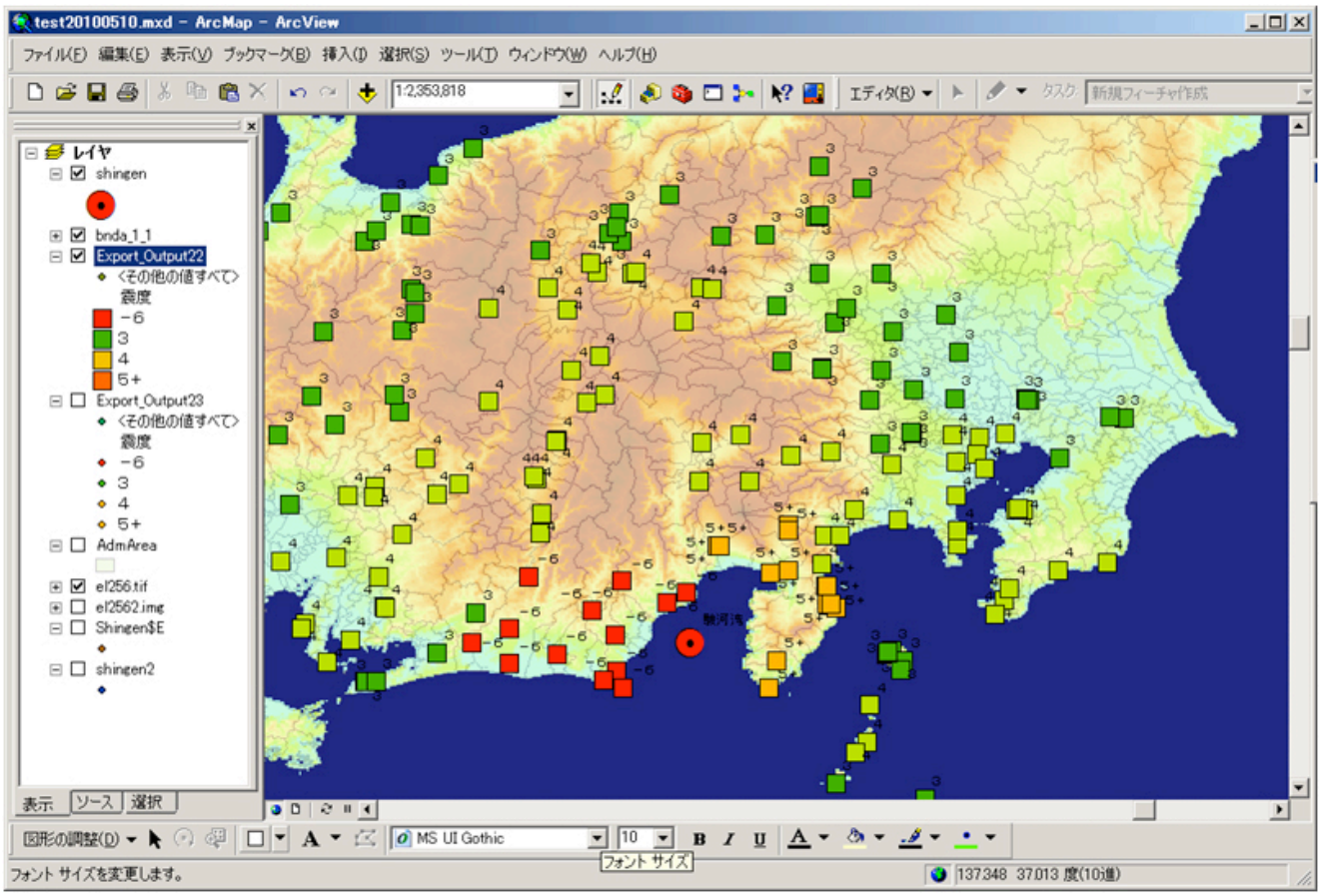

Figure 2 Earthquake scene on GIS system