# P1.19 DISSEMINATING NATIONAL WEATHER SERVICE WATCHES AND WARNINGS USING THE XML BASED RSS AND CAP FORMATS

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## 1) Introduction

The National Oceanic and Atmospheric Administration's (NOAA) National Weather Service has begun exploring of the use of two pre-existing XML formats to disseminate watch, warning and advisories issued by NWS Weather Forecast Offices. Increasing use of Internet technology by NWS partners have resulted in requirements to provide this very important NWS dataset in easy-to-use machine readable data formats. Through the use of these XML formats, partners can quickly access current watches and warnings and easily integrate them into internal and external applications, web pages and other applications.

This presentation will provide an overview of this effort within the NWS. A brief history of the effort, a description of the file formats, and expected future NWS plans for XML use will be discussed.

## 2) History

In 2001, with the development of a robust regional headquarters based web farm infrastructure NWS started to explore a process for the phase out of the well-known NWS website known as IWIN, or Internet Weather Information Network. IWIN, based in NWS' Silver Spring headquarters was hosted on aging hardware and, as NWS' first entry into the Internet age, is based on computer code that is difficult to maintain. Furthermore, in light that most products on IWIN where now available on other NWS websites, the phase out of IWIN represented a savings in limited resources.

Preliminary contact with IWIN customers showed an overwhelming concern over IWIN pages that listed active NWS watches and warnings by state. These web pages were of special interest to state emergency managers since they were not available elsewhere on NWS websites.

At roughly the same time, NWS had recently deployed a set of mirrored databases on most NWS regional headquarters based web farms that contain all active Watches/warnings. These databases were originally deployed to populate maps for Weather Forecast Office homepages that graphical displayed active watches/warnings. The development of software to build replacement state WWA files on regional web farms would both be simple and provide a more robust infrastructure that would not have the single point of failure that IWIN represented.

During this time, NWS received a requirement from the Department of Homeland Security based Disaster Management E-government project to provide this same information, at a national level as an XML data feed. XML, or extensible markup language, is a common architecture for exchange of data between computer systems. Also during this period, NWS developers became aware of two pre-existing XML formats, RSS and CAP that appeared to be a natural fit for the dissemination of WWAs and also meet the DHS requirement.

Development was started on software to generate three sets of files, HTML, CAP and RSS, each integrated with the other, from the existing WWA database. The files would be generated in a continuous loop, assuring they have the most recent data.HTTP cache headers would be used to provide receiving systems with a recommend time-to-live time for the document. In addition, the RSS format also allows a TTL to be included in the data.

The XML formats were pre-existing formats that allowed NWS to jump directly into software development and not get bogged down in XML schema design. RSS, sometimes known as Real Simple Syndication, was originally developed by Netscape Communications as a way to allow users of the Netscape browser to populate a panel in the browser with their favorite information. The simple, easy to understand format was quickly adapted to other uses, including the exchange of news headlines between Internet news websites. Desktop applications were developed that allowed users to collect, or aggregate RSS files to allow the quick browsing of news headlines from many sources in a single window. Aggregation websites were developed to allow users to exchange knowledge and learn the existence of RSS feeds.

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Software libraries have been developed and published in almost any existing computer language to retrieve and parse and RSS document. These tools greatly ease the aggregation of these important NWS products into almost any type of electronic format.

Since NWS watch/warning products can easily be envisioned as a stream of news, use of RSS seemed to be a natural fit. The format allows the user to pick up an RSS file that contains a headline, a brief description and a link to the complete WWA message. Each RSS file contains this data for a US state. The RSS links to the sister HTML document. The use of HTML anchors allows direct linkage to specific watch/warnings.

CAP, or Common Alerting Protocol, was developed by sections of the emergency management community as a standard format for the exchange of alert messages. Version 0.91a of CAP presented many XML tags that allow an entire NWS watch/warning to be presented in a machine format that can be parsed easily. Since other alert messages, outside of NWS products, are expected to use CAP, this makes these NWS products available in a format that will allow integration into many future data streams for emergency managers.

### 3) Data sources

NWS has deployed to regional headquarters web farms relational databases that are populated from NOAAport data feeds. While the database structures are identical, each database is populated by a local NOAAport feed. In addition, Local Data Manager (LDM) software is used to backup each regional database in case of a local NOAAport failure. This infrastructure provides a very robust platform for the production of the HTML/RSS/CAP files. The files can be easily produced at each regional headquarters and be made available from several different NWS websites. Because of this, NWS may elect in the future to globally load balance requests to these files between different web farms. This would provide excellent capacity and redundancy during outbreaks of weather.

### 4) User Interface/data formats

Three files are produced for each US state and Territory. A webpage (HTML) file displays a table of contents that lists active watches/warnings for a state. The table of contents then links to the complete NWS product, listed on the same page. Sister RSS and CAP files are also produced for each state. Both RSS and CAP files provide hyperlinks to the related product on the HTML page.

### 5) Usage and feedback

These products were introduced in November, 2003. Usage and feedback was not available when this paper was produced. Comments will be accepted for these products for at least 90 days after introduction.

### 6) Website

The website for these products is: http://www.nws.noaa.gov/alerts/

A direct effort was made to keep the web pages simple and as graphic free as possible to increase download speed.

### 7) Future Direction

At the end of the public comment period, NWS will review comments, feedback, and usage data and make a decision to either declare the products official or discontinue them. In either case, given the apparent interest in presenting NWS products in XML formats, it expected that additional research, testing and development in the area of XML dissemination is expected. A number of NWS products appear to lend themselves to dissemination via RSS.

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### 9) References

Common Alerting Protocol (CAP):
http://www.incident.com/cap/

RSS 2.0 Specification:
http://blogs.law.harvard.edu/tech/rss