

**Paper for Consideration by WMO/ETMSS
Weather Overlay Feature Catalogue and Portrayal Development**

Submitted by:	USA (NOAA NWS)
Executive Summary:	This paper provides a brief status update of the JCOMM/ETMSS Weather Overlay Project.
Related Documents:	IHO S-100

Introduction / Background

In May of 2012, the 4th Session of the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) established the need for developing a marine weather overlay for Electronic Chart Display and Information Systems (ECDIS). This ECDIS information overlay, a high priority for JCOMM, is expected to improve marine safety services. It will provide analyses and forecasts for maritime weather and sea state in a new digital medium. The NOAA National Weather Service's Ocean Prediction Center was designated to manage the Weather Overlay Project on behalf of the JCOMM's Expert Team on Maritime Safety Services (ETMSS). The Directorate of Hydrography and Navigation (DHN), Brazilian National Hydrographic and Marine Meteorological Service, initiated a dialogue with NOAA to forge a collaborative development effort. Brazil's "Science without Borders" program awarded a grant to the DHN for a visiting scientist to work on the Weather Overlay portrayal at the Ocean Prediction Center from August to November 2014.

Analysis/Discussion

NOAA submitted a finalized draft of the Weather Overlay Feature Catalogue for approval to ETMSS in May 2014. This Feature Catalogue had passed two review periods by ETMSS members over the winter 2013/2014 months and included 40 meteorological and oceanographic objects and 80 attributes. DHN's visiting scientist at the Ocean Prediction Center focused on designing the portrayal and accompanying documents for a set of 13 core maritime weather features most commonly found on international meteorological forecast and analysis charts.

The core feature portrayal specifications were developed using Scalar Vector Graphics (SVG) and eXtensible Markup Language (XML). The feature portrayal includes point, symbols, line styles, area coverages, and a specific colour scheme that defines day, dusk and night pallets. These initial features have been reviewed by ETMSS members and other interested international weather agencies in the same manner as the Feature Catalogue: multiple review and comment periods over several months. Remaining features will be developed and reviewed with a phased approach, beginning with the most common elements and ending with the most obscure. Features still under review are displayed in Appendix A.

One of the challenges encountered during the development of the initial feature portrayal was the lack of an available S-100 viewer to test XML line styles and areas against the S-100 schema. Without a display tool, portrayal catalogue development and testing will proceed slowly, with many significant edits to the catalogue likely when test data can be portrayed.

ETMSS applied to become an IHO Submitting Organization and for an IHO Registry in September 2014 and was officially granted the S-412 Weather Overlay (WXO) registry. Feature objects have been loaded into the Feature Catalogue Builder and attributes will be added when the registry is ready. It is anticipated that numerous changes will be necessary to the Feature Catalogue as the objects and attributes are incorporated into the Weather Overlay Portrayal Catalogue.

Management of the project at the Ocean Prediction Center has recently changed hands due to natural employee turnover. This turnover is expected to cause minimal impact to the timeline, as new personnel have received comprehensive training upon arrival.

Conclusions

The S-412 Weather Overlay has seen significant development over the past three years and will continue with forward momentum as the S-100 specification and development tools mature. International collaboration between DHN and NOAA has proven to be mutually beneficial and greatly moved the Weather Overlay project forward.

NOAA hopes to continue this relationship with DHN in the future, working toward a product that will be ready for dissemination when S-100-enabled ECDIS are in production and ready for installation on vessels.

Recommendations

It is requested that IHO:

- a. Continue providing advice and support for JCOMM/ETMSS on technical issues during S-412 development;
- b. Continue engaging private industry to develop an S-100 viewer for testing portrayal rules and conducting overlay quality control;
- c. Coordination will be required with working groups on tides and currents and sea ice to ensure there is no duplication in the feature definitions.

Justification and Impacts










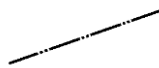





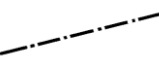





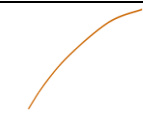









It is expected that IHO comments will contribute significantly to this project's development, assuming user requirements in this interdisciplinary project are met. This new product, together with other new products, shall impact industry and users interests transitioning to S-100 standard.

































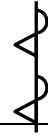

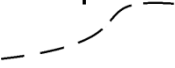




Action Required of TSMAD/DIPWG








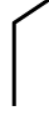




















The IHO is invited to:

- a. Take note of this initiative;
- b. Provide recommendations that may be helpful in developing S-412;
- c. Support JCOMM/ETMSS S-412 activities.

Appendix A: S-412 Feature Portrayals under review as of April 2015

Feature	Acronym	Attribute	Geometry	SVG Symbols Used	Complete Symbol (approximate – no tools available to display actual lines)
Atmospheric Pressure	AIRPSR	All Attributes	Curve		
Atmospheric Pressure	CENHIP	All Attributes	Point		
Atmospheric Pressure	CENDEP	All Attributes	Point		
Convergent Boundary	CONVBO	Intertropical Convergence Zone	Curve		
Convergent Boundary	CONVBO	Squall Line	Curve		
Convergent Boundary	CONVBO	Trough Line	Curve		
Convergent Boundary	CONVBO	Trough	Curve		
Convergent Boundary	CONVBO	Shear Line	Curve		
Convergent Boundary	CONVBO	Convergence Line	Curve		
Convergent Boundary	CONVBO	Monsoon Trough	Curve		
Convergent Boundary	CONVBO	Tropical Wave	Curve		
Freezing Spray	FZSPRY	All Attributes	Curve		
Freezing Spray	FZSPRY	Light	Point, Curve	 	
Freezing Spray	FZSPRY	Moderate	Point, Curve	 	
Freezing Spray	FZSPRY	Severe	Point, Curve		

					
Freezing Spray	FZSPRY	Very Severe	Point, Curve	 	
Front	FRONTS	Cold Front, Developing	Curve		
Front	FRONTS	Cold Front, Dissipating	Curve	 	
Front	FRONTS	Cold Front, Surface	Curve		
Front	FRONTS	Cold Front, Above Surface	Curve		
Front	FRONTS	Warm Front, Developing	Curve	 	
Front	FRONTS	Warm Front, Dissipating	Curve	 	
Front	FRONTS	Warm Front, Surface	Curve		
Front	FRONTS	Warm Front, Above Surface	Curve		
Front	FRONTS	Occluded	Curve	 	
Front	FRONTS	Quasi-stationary Front, Surface	Curve	 	
Front	FRONTS	Quasi-stationary Front, Above Surface	Curve	 	
Front	FRONTS	Convergence Line	Curve		
Front	FRONTS	Dry Line	Curve		
Ice Edge	ICEDGE	All Attributes	Curve		

Ridge	RIDGE	All Attributes	Curve		
Surface Wind	SUWIND	Value of Surface Wind Speed = 2	Point		
Surface Wind	SUWIND	Value of Surface Wind Speed = 5	Point		
Surface Wind	SUWIND	Value of Surface Wind Speed = 10	Point		
Surface Wind	SUWIND	Value of Surface Wind Speed = 50	Point		
Tropical Cyclone	TROCYC	Tropical Disturbance	Point		
Tropical Cyclone	TROCYC	Tropical Depression	Point		
Tropical Cyclone	TROCYC	Tropical Storm	Point		
Tropical Cyclone	TROCYC	Severe Tropical Storm	Point		
Tropical Cyclone	TROCYC	Tropical Cyclone	Point		
Tropical Cyclone	TROCYC	Hurricane	Point		
Tropical Cyclone	TROCYC	Typhoon	Point		
Tropical Cyclone	TROCYC	Super Typhoon	Point		
Tropical Cyclone	TROCYC	Post-tropical Cyclone	Point		

Tropical Cyclone	TROCYC	Subtropical Cyclone	Point	L	L
Tropical Cyclone	TROCYC	Remnant Low	Point	X	X