



Joint WMO-IOC Technical Commission
for Oceanography and Marine Meteorology

Summary Report to ETWS-III

Val Swail, Chair

May 18-22, 2010 Toronto, Canada



WMO



IOC/UNESCO

ETWS Deliverables

1. Develop, and contribute to development of real time operational forecast capability for wind waves and storm surge, as part of marine multi-hazard warning systems, to enhance the capacities of Members to issue more accurate, consistent and timely operational forecast products
2. Develop, and contribute to development of technical advice and guidance on wind waves and storm surge forecasting, as part of marine multi-hazard warning systems
3. Development of capability to provide marine multi-hazard warning services in Least Developed Countries through Capacity Building activities
4. Develop, and contribute to development of wind wave and storm surge climatology as a measure of risk assessment for marine hazards

ETWS Key Achievements (2005-2009)

- **Documented Wave and Surge Observation Requirements**
 - CEOS/WMO database, *Statement of Guidance for Ocean Applications*
 - 2 Community White Papers to the *OceanObs'09 Conference*
 - Initiated two DBCP Pilot Projects, on wave measurements from drifters and on wave measurement evaluation and testing from moored buoys
- **Documented operational and pre-operational wave & storm surge numerical models and data bases**
 - Advanced centres that make freely available global and regional wave products and data sets
 - NOAA/NCEP provides access to wave spectral data and model source code; ECMWF now provides access to 0.5 degree products
- **Wave Forecast Verification scheme expanded to 12 centres**
 - Established collaboration with ESA through the GlobWave project to extend the project to consider altimeter data and spatial verification

ETWS Key Achievements (2005-2009) (2)

- **Plan for enhancing national and regional capabilities for coastal hazards forecasting and warning systems**
 - through scientific and technical development, with special emphasis on large coastal cities at risk of ocean-related and meteorological hazards
 - Advisory workshop on Enhancing forecasting capabilities for North Indian Ocean Storm Surges
 - ESA User Consultation Meeting on Storm Surges

- **Links to JCOMM ETMC re wave and surge climate activities**
 - Development of JCOMM Extreme Waves Data Base
 - Organize JCOMM/OGP/WCRP Climate Change and the offshore industry workshop – Geneva -May 2008
 - Co-organize MARCDAT-II Workshop – Exeter November 2006
 - Co-organize CLIMAR-III Workshop – Gdynia May 2008
 - Present requirements for wave and surge climate indices to ETCCDI

Key Achievements - Guides and Technical Documentation

- **Published JCOMM Guide to Storm Surge Forecasting**
- Reviewed *Guide to Wave Analysis and Forecasting* (published 1998) and recommended a revised version be published
- Content developed for dynamic parts of Wave and Storm Surge Guides
- Techniques and Benefits of Satellite Data and Wave Models (JCOMM/TR-33)
- Verification of Operational Global and Regional Wave Forecasting Systems against Measurements from Moored Buoys (JCOMM/TR-30).
- Special issues of *Marine Geodesy* and *Natural Hazards* published from 28 papers from the Storm Surge Symposium
- Contributed to UNESCO/IOC Hazard Awareness and Risk Mitigation in Integrated Coastal Management (ICAM) Guide
- ETWS/DBCP Wave Measurement Technology from buoys workshop and its final report (JCOMM/TR-47)
- JCOMM/OGP/WCRP Workshop on Climate Change and the Offshore Industry (JCOMM/TR-42)

- **1st JCOMM Scientific and Technical Symposium on Storm Surges**
 - surgesymposium.org
 - Recommendations and Action Plan endorsed by both WMO and IOC
 - Produced JCOMM Technical Report (JCOMM/TR-44)
 - Produced two special journal issues, one on operational aspects, one on numerical modelling
 - Spawned several follow on projects including
 - UNESCO/IOC pilot project on Enhancing Forecasting Capabilities for North Indian Ocean Storm Surges
 - JCOMM/CHy Coastal Inundation Forecasting Demonstration Project
 - ESA Storm Surge Project
 - IOC support for Storm Surge Congress September 2010
- **International Workshop on Wave Hindcasting and Forecasting**
 - waveworkshop.org
 - 9th, 10th and 11th Workshops – Victoria, Canada (2006), Oahu, US (2007), Halifax, Canada (2009)
 - Included joint 1st and 2nd Coastal Hazards Symposium at Oahu and Halifax workshops
 - Produced JCOMM Technical Reports for each workshop

- **JCOMM/TCP Workshop on Storm Surge and Wave Forecasting**
 - 4th, 5th Workshops – Philippines (2006), Australia, (2008)
 - transferred skills and forecasting models to the participants through hands-on training to enable them to run operational wave and storm surge forecasting in their home countries
- **Expansion of the WMO Severe Weather Forecasting Demonstration Project (SWFDP) to include marine issues**
 - Promoted implementation of specialized numerical prediction capabilities for improvement of severe weather forecasting of waves and storm surges in southern Africa.

ETWS Priority Projects (8.4.ii)

ETWS Projects and Work Plans for the Intersessional Period

	Workplan / expected outcome, deliverables	How (Key Activities/Actions)	Lead (bold) Members	Timelines	Associated meetings (for discussion)	Resource Required	ETs (bold)/ Linked with
8	Implement the recommendations from the 1 st JCOMM SS Symposium: Support developing extreme wave database	<ul style="list-style-type: none"> Template for extreme wave documentation agreed (ETMC) Request input from countries, through OPA groups & Secretariat 	Val Swail	<ul style="list-style-type: none"> May'10 template agreed, and request input from countries (continue) 	ETMC (Feb'10) ETWS (May'10)		ETWS, ETMC , NOAA/NO DC, OPA groups
9	Implement the recommendations from the 1 st JCOMM SS Symposium: Support developing SS climatology		Val Swail ...	<ul style="list-style-type: none"> Sep'10 discussion session on SS climatology 	ETMC (Feb'10) ETWS (May'10) SSC2010 (Sep'10)		ETWS , ETMC , LOICZ
10	Implement the recommendations from the 1 st JCOMM SS Symposium: Support related S&T fora	<ul style="list-style-type: none"> Support SSC2010 (JCOMM experts participation to organization & presentations) Plan the 2nd SS Symposium 	Val Swail Kevin Horsburgh Thomas Bruns ...	<ul style="list-style-type: none"> Sep'10 SSC2010 discussion on SS climatology May'12 approval on 2nd SS Symposium (after 2012) plan 	ETWS (May'10) SSC2010 (Sep'10)	Expert participation on to SSC2010 (external funding)	ETWS , ETMC , LOICZ
11	Support UNESCO pilot project on coastal hazard forecasting	<ul style="list-style-type: none"> SS Experts/ET members participation in NIO workshop Review project progress in view of JCOMM work plan implementation 	Kevin Horsburgh Val Swail Hans De Vries Don Resio	<ul style="list-style-type: none"> Feb'02 conduct NIO workshop 	ETWS (May'10) PP meeting (? '10) UNESCO NIO workshop (Feb'11)	Expert participation on to NIO workshop (Resources: UNESCO/IOC)	ETWS , IOC/ICAM
12	Support JCOMM/Chy Coastal Inundation Forecast Demonstration Project		Val Swail Don Resio				ETWS
13	Facilitate the development of Storm Surge Watch Schemes (SSWS) for regions subject to tropical cyclones		Val Swail ...				ETWS
14	Support WMO Severe Weather Forecasting Demonstration Project (SWFDP) with respect to wave and storm surge issues		Val Swail ...				ETWS
15	Lead DBCP Pilot Projects on wave measurement evaluation and test (PP-WET)	<ul style="list-style-type: none"> Review&update wave measurement requirements as necessary Participate in intercomparison exercise & analysis 	Val Swail Bob Jensen ...	<ul style="list-style-type: none"> Jan'10 intercomparison website launch Nov'10 PP 1st phase PP complete, plan for 2nd phase 	PP-WET SC (Feb'10) ETWS (May'10) DBCP-26 (Sep'10)	Website development (external resources)	OPA/DBCP
16	Expansion of Wave Forecast Verification Exchange Project in coordination with the ESA GlobWave project	<ul style="list-style-type: none"> Review&update wave measurement requirements as necessary ET members / experts participation 	Val Swail Jean Bidlot	<ul style="list-style-type: none"> GlobWave Mtg (May 10) Spatial Intercomp. (May 12) 	ETWS (May'10)		ETWS, ESA, ECMWF
17	Develop and update guidance documents	<ul style="list-style-type: none"> Update wave guide by ET input + consultant work Update dynamic part of SS guide as necessary (ET input) 	Val Swail	<ul style="list-style-type: none"> May'10 outline/contents of Wave guide agreed May'12 Wave guide publication 	ETWS (May'10)		

Green – Project outcomes achieved by JCOMM-IV

Yellow – Possible to achieve the outcomes by JCOMM-IV

White – Completion time line to be determined

Blue – Lead by other PAs/Organizations

(#16) Wave Forecast Verification Project

Jean Bidlot

- **Expected Outcomes:**
 - Expansion of the Wave Forecast Verification Exchange Project in coordination with the ESA GlobWave project
- **Key Activities:**
 - Review & update wave measurement requirements as necessary
 - Expand number of global and regional participants
 - Expand verification scope to spatial, spectral, satellite
- **Timeline/milestones:**
 - ETWS (May'10)
 - GlobWave meeting (May'10)
 - Spatial intercomparison with GlobWave (May'12)
- **ETs, Other Organizations and participants:**
 - ETWS, ECMWF, ESA

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B.Lee22

Boram Lee, 24/09/2008

(#15) Wave measurement evaluation and test

Val Swail, Bob Jensen, Boram Lee

- **Expected Outcomes:**

- guidance on best practices for wave measurement to WIGOS/WIS

- **Key Activities:**

- Lead DBCP Pilot Project on wave measurement evaluation and test (WET)
- Review & update wave measurement requirements as necessary
- Participate in, and provide guidance to intercomparison exercise & analysis

- **Timeline/milestones:**

- Jan'10 intercomparison website launch
- Report to DBCP-XXVI (Sep'10)
- Nov'10 PP 1st phase PP complete, plan for 2nd phase

- **ETs, Other Organizations and participants:**

- ETWS, OPA/DBCP , Scripps, OGP

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B.Lee21

Boram Lee, 24/09/2008

(#11) UNESCO pilot project on coastal hazard forecasting

Val Swail, Boram Lee, Kevin Horsburgh, Shishir Dube

- **Expected Outcomes:**

- Guide UNESCO pilot project on coastal hazard forecasting
- Establish action plans for the next phase of the project

- **Key Activities:**

- SS Experts / ET members participation in NIO workshop
- Review project progress in view of JCOMM work plan implementation

- **Timeline/milestones:**

- May 10: ETWS meeting
- Feb. 11: NIO workshop
- Aug. 11: Action plan developed

- **ETs, Other Organizations and participants:**

- ETWS, IOC/ICAM, IIT (India)



WMO



IOC/UNESCO

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B.Lee24

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(#17) Develop and update guidance documents

Val Swail, Thomas Bruns

- **Expected Outcomes:**

- Revised Guide to Wave Analysis and Forecasting (WMO 702)
- Dynamic parts of wave and storm surge guides online

- **Key Activities:**

- Update wave guide by ET input + consultant work
- Update dynamic part of guides as necessary (ET input)

- **Timeline/milestones:**

- May'10 outline/contents of Wave guide agreed
- May'12 Wave guide publication
- Technical Reports on extreme value analysis (June'10)

- **ETs, Other Organizations and participants:**

- ETWS

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B.Lee23

Boram Lee, 24/09/2008

(#8) Support Climate Services: Extreme Waves Data Base

Val Swail, Scott Woodruff, Charles Sun

- **Expected Outcomes:**
 - Establishment of an extreme wave database
- **Key Activities:**
 - Develop the plan for extreme wave documentation (with ETMC)
 - Request input from countries, through OPA groups & Secretariat
 - Develop plan to extend the DB to include satellite altimeter wave data
- **Timeline/milestones:**
 - May'10 EWDB plan agreed for database hosted at NOAA/ NODC
 - October'10 ETMC/NODC template agreed
 - Request input from countries (ongoing)
- **ETs, Other Organizations and participants:**
 - ETWS, ETMC, NOAA/NODC, DMPA groups

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B.Lee27

Boram Lee, 24/09/2008

(#9) Support Climate Services: Storm Surge climatology

Val Swail, Scott Woodruff, Kevin Horsburgh

- **Expected Outcomes:**
 - Establishment of a storm surge database with ETMC
- **Key Activities:**
 - Develop the plan for a storm surge data base with ETMC
 - Support to ETMC to develop the SS database
 - Identify host institution(s) for data base
- **Timeline/milestones:**
 - ETMC (Feb'10) agree on the objectives
 - ETWS(2010) to propose plan, decide on timeline
 - SSC2010 (Sep'10) discussion session on SS climatology
 - Plan agreed for storm surge data base at MARCDAT-III (Feb'2011)
- **ETs, Other Organizations and participants:**
 - ETWS, ETMC, POL

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B.Lee25

Boram Lee, 24/09/2008

(#10) Implement recommendations from JCOMM SSS

Val Swail, Kevin Horsburgh, Thomas Bruns, Boram Lee, Don Resio

- **Expected Outcomes:**

- Implement the recommendations from the 1st JCOMM SS Symposium: Support related S&T fora

- **Key Activities:**

- Support SSC2010 (JCOMM experts participation to organization & presentations)
- Support ESA Storm Surge Project(s)
- Organize Wave Workshop and Coastal Hazards Symposium
- Plan the 2nd SS Symposium

- **Timeline/milestones:**

- Sep'10 SSC2010
- ESA Storm Surge project kick off (Oct'10)
- 12th Waves Workshop and 3rd Coastal Hazards Symposium (Nov'11)
- May'12 approval on 2nd SS Symposium (after 2012) plan

- **ETs, Other Organizations and participants:**

- ETWS, ESA, IOC, LOICZ , Environment Canada, USACE

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B.Lee28

Boram Lee, 24/09/2008

Other Projects

- #12 - Support JCOMM/CHy Coastal Inundation Forecast Demonstration Project
- #13 - Facilitate the development of Storm Surge Watch Schemes (SSWS) for regions subject to tropical cyclones
- #14 - Support WMO Severe Weather Forecasting Demonstration Project (SWFDP) with respect to wave and storm surge issues
- #21 - In association with ETMSS, develop guidelines and recommendations to update WMO n°471 and 558, especially for the provision of sea state in MSI

Wind Waves and Storm Surge

