



FY09 Verification Plan

Verification Planning Team:

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2nd RFC Verification Workshop, November 08



FY09 Activities

- Logistical verification service
- CHPS Verification Service
 - CHPS-VS within FEWS
 - Science and software enhancements
- XEFS validation
- RFC verification workshop
- Collaborations



Logistical Verification Service

- Goal:
 - compute, display, and disseminate forecast services logistical measures information
 - develop a plan to compute remaining logistical measures
- Deliverables:
 - Support of RFC verification focal points to populate the database
 - Report of common forecast services metric queries; display prototype maps of point forecast services; experimental web pages of forecast services
- Resources: Mary M.



CHPS Verification Service

- Goal: develop CHPS Verification Service for single-valued & ensemble forecasts based on IVP & EVS functionalities
- Activities:
 - Support CHPS-VS development within CHPS-FEWS
 - Coordination with CHPS-FEWS plan & collaboration with Deltares
 - Enhance verification science and software (EVS, real-time verification prototype): 6 tasks



CHPS Verification Service

- Deliverables:
 - CHPS-VS development within CHPS-FEWS
 - Coordination with CHPS-FEWS plan & collaboration w/ Deltares
 - CHSP-FEWS deliverable: CHPS Verification System design based on EVS-IVP combination; prototype in FY10?
 - Plan for CHPS-VS future enhancements (e.g. grid forecast verification by leveraging available tools)
 - Enhanced verification science and software



CHPS Verification Service

- Deliverables:
 - CHPS-VS development within CHPS-FEWS
 - Enhanced verification science and software:
 1. EVS enhancements: EVS prototype version 2 + paper
 2. User-friendly metrics: paper on new user-friendly metrics
 3. Combined metrics: report on best strategies
 4. Real-time verification: research prototype + paper
 5. Sampling uncertainty: confidence intervals codes/graphics
 6. Error decomposition of flow forecasts: codes + report



CHPS Verification Service:

1. EVS enhancements

- Goal: improved science & software in EVS
- Deliverables
 - Minor updates/bug-fixes: support ongoing work at RFCs (e.g. MARFC, ABRFC) and within HEP through timely updates/bug fixes
 - Major enhancements: include enhancements to EVS in prototype Version 2.0 (release date TBD)
 - Paper on EVS software
- Resources: James B. (lead), Julie D., Yuqiong L.



CHPS Verification Service:

2. User-friendly metrics

- Goal: easily understandable verification metrics in EVS
- Deliverables
 - Develop a discrimination-type measure and include in EVS
 - Write a paper on user-friendly metrics
- Resources: James B. (lead), Julie D., Yuqiong L.



CHPS Verification Service:

3. Combined metrics

- Goal: condensed verification info for operations
- Deliverables
 - Write a report on how best to condense information in ensemble verification measures
- Resources: James B. (lead), Julie D., Yuqiong L.



CHPS Verification Service:

4. Real-time verification

- Goal: assess quality of real-time ensemble forecasts from past forecasts and observations and, if necessary, correct bias
- Deliverables
 - Complete evaluation of real-time prototype by FY09 Q2
 - Write paper on real-time verification technique
 - Conduct experiments with the prototype at an RFC
- Resources: James B. (lead) and DJ Seo



CHPS Verification Service:

5. Sampling uncertainty

- Goal: develop software for Confidence Interval estimation for single-valued & ensemble verification metrics
- Deliverables
 - Compute CI for single-valued and ensemble metrics and develop basic graphics for a few metrics (e.g., scores); to be used for XEFS validation
 - Report on current codes and future work (e.g., improved graphics with CI)
- Resources: Yuqiong L. (lead) and James B.



CHPS Verification Service:

6. Error decomposition

- Goal : differentiate errors in peak value, peak timing & hydrograph shape
- Deliverables
 - Codes and report; functionality to be integrated in CHPS-VS in ~FY10
- Resources: Yuqiong L. (lead), James B., Julie D.



XEFS Validation

- Goal: support EXperimental Ensemble Forecast System (XEFS) development with systematic ensemble hindcasting and verification
- Activities:
 - Implement Hindcaster in CHPS-FEWS to support verification work and uncertainty source analysis
 - Verify all XEFS experimental ensembles for test basins to validate XEFS components (EPP, EnsPost, HMOS...)
 - Verify NCEP and XEFS ensembles at multiple scales for Thorpex-Hydro project

➤ Coordination with XEFS plan



XEFS Validation

- Deliverables
 - Ensemble hindcaster workflow for XEFS test basins
 - Paper on verification results for XEFS ensembles (EPP, EnsPost, HMOS...TBD)
 - Report on verification results of NCEP and XEFS ensembles at multiple scales for Thorpex-Hydro project
- Resources: Julie D., Yuqiong L., and James B.
 - Coordination with XEFS plan



RFC Verification Workshop

- Goal: review RFC case studies, present progress on verification projects, and develop standardized verification strategies
- Deliverable
 - Workshop, material on verification team website
- Resources: Julie D., James B., Yuqiong L., Mary M., Kevin W.



Collaborations

- Activities:
 - Support NWS Verification Team & RFCs:
 - Interim team report on case studies, archiving survey & requirements, IVP & EVS exercise
 - Final team report to propose verification standards for selected users and list required software enhancements
 - Improved communication: team website, verif-hydro listserver
 - Expanded/new case studies to evaluate proposed verification standards
 - Definition of raw model baseline with an RFC Team
 - Sensitivity analysis of flow verification to rating curves at some RFCs (e.g., ABRFC for HMOS project)



Collaborations

- Activities:
 - Support NWS Verification Team & RFCs
 - Coordinate & collaborate with NCEP (ThorpeX-Hydro project; NCEP unified verification system)
 - Collaborate with Performance Branch (implementation & dissemination of verification standards)
 - Coordinate with WR Water Supply Team
 - Support RFC Archive Team
 - Collaborate with academia (Allen Bradley, Kristie Franz), Deltares & HEPEX (verification test bed)
 - Papers, workshops/conferences, NPMC meetings, OSIP/HOSIP support
 - Contribution to COMET training modules



Collaborations

- Deliverables:
 - **NWS Verification Team & RFCs**: final team report (Q2), paper on RFC case studies based on verification standards; definition of raw model baseline; report on sensitivity analysis to rating curve for test basins
 - **Requirements for Performance Branch** to implement & disseminate verification standards
 - **HEPEX verification test bed** & initial inter-comparison of verification results (HEPEX workshop, June 09)
 - **BAMS paper** on CHPS-VS
 - **Abstracts/presentations** at AGU Fall meeting (Dec. 08), AMS meeting (Jan 09), EGU conference (Apr. 09), 4th International Verification Workshop (June 09)
 - **COMET verification training modules**



FY09 Activities: Summary

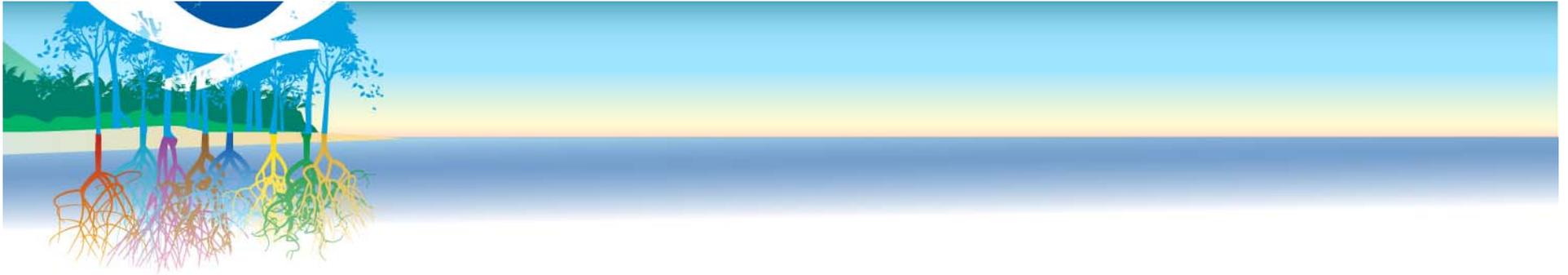
- Logistical verification service
- CHPS Verification Service
 - CHPS-VS within FEWS (see CHPS-FEWS plan)
 - Software and science enhancements
 1. EVS enhancements
 2. User-friendly metrics
 3. Combined metrics
 4. Real-time verification
 5. Sampling uncertainty
 6. Error decomposition
- XEFS validation (see XEFS plan)
- RFC verification workshop
- Collaborations



FY09 Deliverables: Summary

- **Logistical verification service:** prototype maps and web pages of forecast services
- **CHPS Verification Service**
 - CHPS-VS prototype (EVS-IVP combination) (see CHPS-FEWS plan) & plan for future CHPS-VS enhancements
 - EVS prototype version 2 + paper
 - Paper on user-friendly metrics, report on best strategies to combine info
 - Real-time verification research prototype + paper
 - Codes for CI for few metrics, codes + report for error decomposition
- **XEFS validation:** hindcaster (in CHPS-FEWS), verification results of XEFS/NCEP ensembles at multiple scales (see XEFS plan)
- **RFC verification workshop**
- **Collaborations**
 - NWS Verification Team final report, paper on verification standards & case studies; raw model definition; sensitivity analysis to rating curves
 - Requirements for Performance Branch for implementation of standards
 - BAMS paper, HEPEX verification test bed, abstracts at 4 conferences
 - COMET verification training modules





Thank you

Questions?