

# Water Level Gauge Data Communications

A Proposed Pilot Project for Hampton Roads

Mark Bushnell, CoastalObsTechServices & Brian Jackson, NWS/OHD/HSEB

**STATUS** – The cities of Virginia Beach (11), Norfolk (4), & Chesapeake (4) plan to install real-time water level gauges to meet local needs.

**ISSUE** - The real-time data terminates within each locality. How to communicate the data to others?

**SOLUTION** – 1) SHEF encoding, 2) Formal request for data, 3) **HADS IP pull**, 4) NWS Telecommunications Gateway push



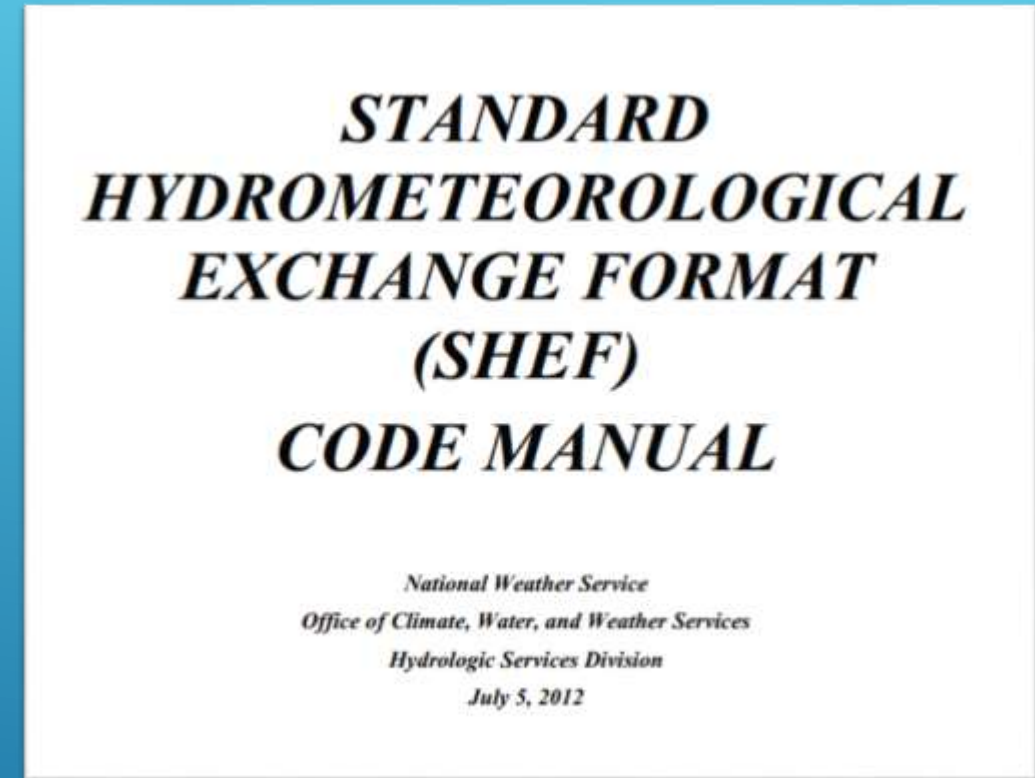
*Coastal Obs Tech Services LLC*

# WHAT IS SHEF?

[http://www.nws.noaa.gov/om/water/resources/SHEF\\_CodeManual\\_5July2012.pdf](http://www.nws.noaa.gov/om/water/resources/SHEF_CodeManual_5July2012.pdf)

The Standard Hydrometeorological Exchange Format (SHEF) is a documented set of rules for coding of data in a form for both visual and computer recognition. It is designed specifically for real-time use and is not designed for historical or archival data transfer. All the critical elements for identification of data are covered. Station identifiers, parameter descriptors, time encoding conventions, unit and scale conventions, and internal and retained comment fields are all part of the code.

SHEF was designed for interagency sharing of data, visual and machine readability. The widespread implementation of SHEF allows the same decoding software to process data from various agencies. New data sources can easily be added as they become available. The visual nature of SHEF allows users quickly to become familiar with it. SHEF fully qualifies the data so that receiving databases have all the necessary information to describe the data.



Coastal Obs Tech Services LLC

**NOAA Technical Report NOS CO-OPS 026**

---

**A Guide to CO-OPS SHEF and CREX Products**

**Janet Burton**  
Information Systems Division  
September, 2001  
Revised March 2002  
Revised October 2004

**Kathleen Bailey**  
Oceanographic Division

**Jay Benedetti**  
**John Cassidy**  
Information Systems Division



**Revised October 2013**

**U.S. DEPARTMENT OF COMMERCE**  
Penny Pritzker, Secretary

**National Oceanic and Atmospheric Administration**  
**Dr. Kathryn D. Sullivan**  
Acting Undersecretary of Commerce for Oceans and Atmosphere and Acting NOAA

# WHAT IS HADS?

<http://www.nws.noaa.gov/oh/hads>



The Hydrometeorological Automated Data System (HADS) is a real-time data acquisition and data distribution system operated by the Office of Hydrologic Development of the National Weather Service.

HADS web pages are structured to provide necessary system information and site meta-data to National Weather Service Offices.

Data values presented on HADS web pages are PROVISIONAL and **HAVE NOT** been reviewed nor evaluated through quality control tests.

## Site Search

<p>Enter NESDIS ID</p> <input type="text"/>	<p>Enter NWSLI ID</p> <input type="text"/>
<input type="button" value="Go"/>	<input type="button" value="Go"/>

More than 15,100 data points on the image below represent the locations at which river and weather data are observed and subsequently processed by HADS.



Coastal Obs Tech Services LLC



## GETTING DATA TO HADS

- HADS historical data source was GOES satellite telemetry only
- March 2013, ingest & process data from IFLOWS/ALERT stations in the NWS Eastern Region
  - Data from more than a dozen data partners (over 1200 sites total, 400 SHEF encoded)
  - DATA pushed (FTP) to a server that later pushes it to HADS for processing
  - Data sent in a standardized SHEF format, so HADS could easily process it

## PROPOSED DATA PATH

- SHEF formatted data pulled from local source by HADS
- HADS adds necessary wrappers / formatting
- HADS sends it to the NWS Telecommunications Gateway for dissemination to the WFOs
- Anyone familiar with NWS products can access the data
- Access by NOAAPort, [mesonet.agron.iastate.edu/wx/afos](http://mesonet.agron.iastate.edu/wx/afos), [www.unidata.ucar.edu](http://www.unidata.ucar.edu)



## What this does...

- Quickly gets local data to Wakefield WFO
- Makes data available to be integrated
- Data from disparate sources is provided in a standardized format
- Easy ingest by CO-OPS, MARACOOS, or other data center

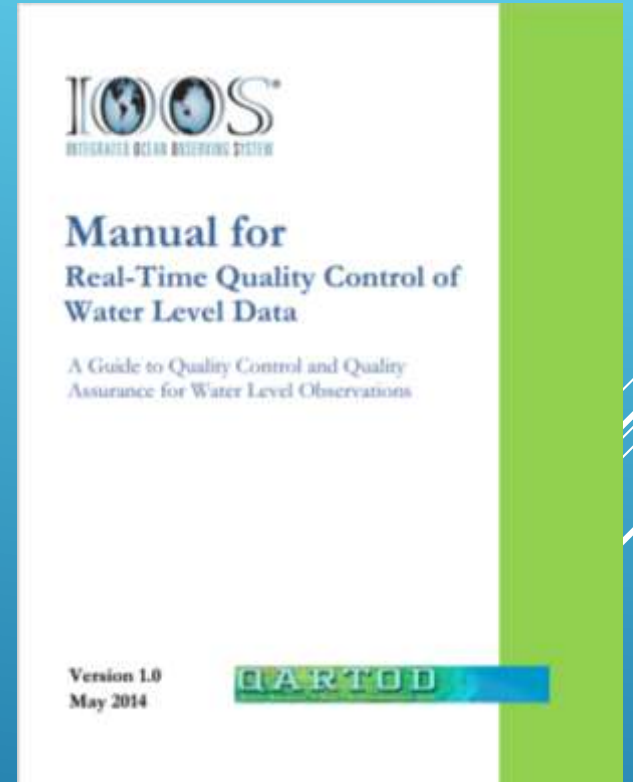
## What it doesn't do...

- Real time QC ([http://www.ioos.noaa.gov/qartod/water\\_level](http://www.ioos.noaa.gov/qartod/water_level))
- Enhance robustness, relies on Internet
- Provide for archive access
- Create products for users

...but these won't happen without this first step!

## • What next...

- HR cities, vendors, & NOAA collaborate to SHEF encode local data
- Pick a station, demonstrate the capability, repeat



Coastal Obs Tech Services LLC

# SUMMARY

- SHEF/HADS discussion launched at ODU / MTS TechSurge June 3-4, 2014
- Data communications plan feeds users globally
- Uses well established standards
- Uses existing capabilities (~12,000+ SHEF-encoded sites)
- Requires just one new effort (HADS IP pull)
- No cost
- Quickly implemented – perhaps demo'd 2014 hurricane season?

<http://mtshamptonroads.org/mtshr>



*Coastal Obs Tech Services LLC*