



NWS Hazard Simplification Project: *Simplifying and Clarifying the Message*



**Presentation for Subcommittee on Disaster Reduction
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Presentation Outline

- NWS' "Watch, Warning and Advisory" (WWA) messaging system
 - *Definitions and issues*
- Project Goals: How can we simplify and clarify the message?
- Engagements so far; feedback to date
- Options for "REPAIR" & "REVAMP"
- Plan forward; demonstrating options for change



The NWS WWA System: Definitions

Watch

We **FORECAST THE POTENTIAL** for a significant hazard. Timing and/or occurrence is still uncertain.

Warning

We **WARN FOR A DANGEROUS** hazard that is imminent or occurring. Significant threat to life and/or property.

Advisory

We **ADVISE CAUTION** for notable hazards that are imminent or occurring - but are not inherently dangerous.

WWA: What Are The Issues?
Orthogonal Logic!

"How far in advance can I issue this?"



WATCH

"Watch out!"

"WA-WA!"

"Is this a downgrade?"

WARNING

"Which is worse?"

ADVISORY

"You're advising me to do – what?"

Fixed Impact, Increasing Certainty

Fixed Certainty, Increasing Impact

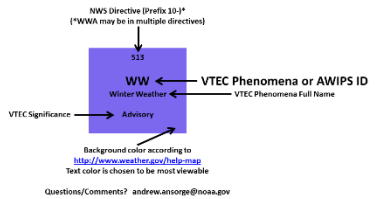
WWA: What Are The Issues?

Product Proliferation: An "Element" of Confusion!



NWS Watch, Warning, Advisory Periodic Table

511 TO Tornado Warning																	513 BZ Blizzard Warning				
511 SV Severe Thunderstorm Warning	511 SV Severe Thunderstorm Statement																	513 WW Winter Weather Advisory	513 WS Winter Storm Watch	513 WS Winter Storm Warning	513 BZ Blizzard Watch
512 TO Tornado Watch	512 SV Severe Thunderstorm Watch																	513 LE Lake Effect Snow Watch	513 LE Lake Effect Snow Advisory	513 LE Lake Effect Snow Warning	513 IS Ice Storm Warning
601 HU Hurricane Warning	601 HU Hurricane Watch	601 TS Tropical Storm Warning	601 TS Tropical Storm Watch	601 TY Typhoon Warning	601 TY Typhoon Watch	601 EW Extreme Wind Warning	601 HL Hurricane Local Statement	601 HL Tropical Storm Local Statement	601 HL Typhoon Local Statement	601 HL Tropical Depression Local Statement	922 FF Flash Flood Warning	922 FF Flash Flood Watch	922 FF Flash Flood Statement	513 WC Wind Chill Watch	513 WC Wind Chill Advisory	513 WC Wind Chill Warning	513 ZR Freezing Rain Advisory				
922 FL Flood Warning	922 FL Flood Advisory	922 FL Array and Small Stream Flood Advisory	922 FL Small Stream Flood Advisory	922 FL Urban and Small Stream Flood Advisory	922 FL Flood Watch	922 FL Flood Statement	922 HY Hydrologic Advisory	922 ESF Hydrologic Outlook	320 CF Coastal Flood Warning	320 CF Coastal Flood Advisory	320 CF Coastal Flood Watch	320 CF Coastal Flood Statement	320 LS Lakeshore Flood Warning	320 LS Lakeshore Flood Advisory	320 LS Lakeshore Flood Watch	320 LS Lakeshore Flood Statement	320 RP Rip Current Statement				
320 SU High Surf Warning	320 SU High Surf Advisory	320 BH Beach Hazard Statement	313 MA Special Marine Warning	314 MW Marine Weather Statement	315 AF Ashfall Warning	315 AF Ashfall Advisory	315 BW Brisk Wind Advisory	315 FG Dense Fog Advisory	315 SM Dense Smoke Advisory	315 ZY Freezing Spray Advisory	315 GL Gale Warning	315 GL Gale Advisory	315 SE Hazardous Seas Warning	315 SE Hazardous Seas Watch	315 UP Heavy Freezing Spray Warning	315 UP Heavy Freezing Spray Watch	315 HF Hurricane Force Wind Warning				
315 HF Hurricane Force Wind Watch	315 LO Low Water Advisory	315 SC Small Craft Advisory	315 SC Small Craft For Hazardous Seas Advisory	315 RB Small Craft For Rough Bar Advisory	315 SI Small Craft For Winds Advisory	315 SR Storm Warning	315 SR Storm Watch	701 TS Tsunami Warning	701 TS Tsunami Advisory	701 TS Tsunami Watch	401 FW Red Flag Warning	401 FW Fire Weather Watch	401 Extreme Fire Danger	517 HWO Hazardous Weather Outlook	517 NOW Short Term Forecast	517 SPS Special Weather Statement	519 AQA Air Quality Alert				
515 AS Air Stagnation Advisory	515 DU Blowing Dust Warning	515 DU Blowing Dust Advisory	515 EH Excessive Heat Warning	515 EH Excessive Heat Watch	515 EC Extreme Cold Warning	515 EC Extreme Cold Watch	515 FZ Freeze Warning	515 FZ Freeze Watch	515 ZF Freezing Fog Advisory	515 FR Frost Advisory	515 HZ Hard Freeze Warning	515 HZ Hard Freeze Watch	515 HT Heat Advisory	515 HW High Wind Warning	515 HW High Wind Watch	515 LW Lake Wind Advisory	515 WI Wind Advisory				
518 AV Avalanche Warning	518 AV Avalanche Advisory	518 AV Avalanche Watch	518 TOE 911 Telephone Outage	518 ADR Administrative Message	518 CAE Child Abduction Emergency	518 CDW Civil Danger Warning	518 CEM Civil Emergency Message	518 EQ Earthquake Warning	518 EVI Evacuation Immediate	518 FR Fire Warning	518 HM Hazardous Materials Warning	518 LEW Law Enforcement Warning	518 LAE Local Area Emergency	518 NUW Nuclear Power Plant Warning	518 RH Radiological Hazard Warning	518 SP Shelter in Place Warning	518 VO Volcano Warning				



Project Goals

What do We Want From Our Messaging System?

- **Improve User Risk Assessment**
- **Expand User Awareness**
- **Foster User Comprehension**
- **Provide Maximum Forecaster Flexibility**
- **Enable Rapid Partner Decision Making**
- **Create a Credible, Consistent Framework**



Project Engagement to Date

Social Science Analysis Still Ongoing

■ 2014 Focus Groups:

- 4 cities, 5 constituent groups (including EMs)
- Spectrum of understanding, “Advisory” misunderstood

■ 2015 American Meteorological Society:

- Town Hall, survey, exhibit booth
- Results indicated a desire for change

■ 2015 Qualitative WWA Case Study Survey

- Focus on WWA strengths, weaknesses
- About 800 responses; draft report completed

■ 2016 “Institutionalization” Survey

- How deeply is WWA embedded in policy and/or law?
- Wide survey to be publicized soon

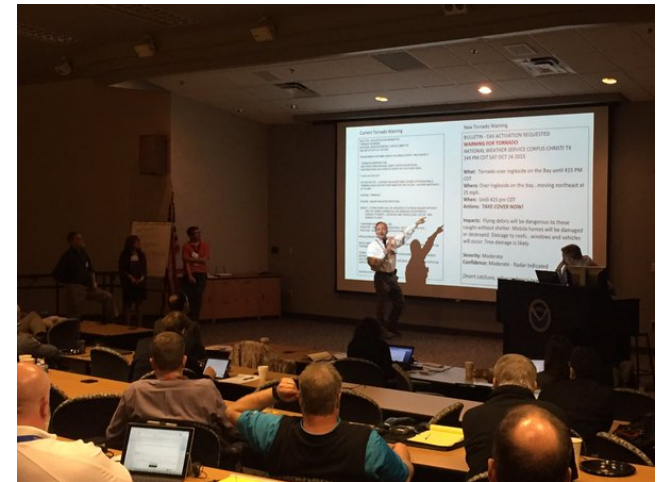


And... 7

The Haz Simp Workshop

An Intensive and Rewarding Experience!

- Held Oct 27-29 at the NWS Training Center
- **115 attendees:** NOAA/NWS staff, EMs, Weather, Water and Climate Industry, social scientists
- Breakout group process used to identify prototypes and ideas
- We got what we asked for – and more!
- Common themes emerged for discussion/follow-on



Feedback Received Up Until The Workshop

There Were Some Recurring Themes

- WWA terms: A spectrum of understanding
- Support for a color and/or numbering scheme, and symbols
- “Advisory” is generally **misunderstood**; “Watch” and “Warning” are sometimes confused
- Support for an “Emergency” tier for **“This one is different!”**
- Shorten and focus the message

Feedback From Workshop

We Kept Hearing The Same General Things!

- Consolidate the current 122 WWA products
- Little support for retaining “Advisory”; a number of groups also suggested replacing “Watch”
- Many groups suggested replacing WWA terms with action, risk and/or impact statements (Be Aware, Prepare, Emergency):

Example: “Winter Storm - Take Action!”

- There were suggestions for a 3-5 tier, hierarchical color scheme to communicate different levels of “Warning” or “Take Action”

Two Categories of Potential Change Have Emerged

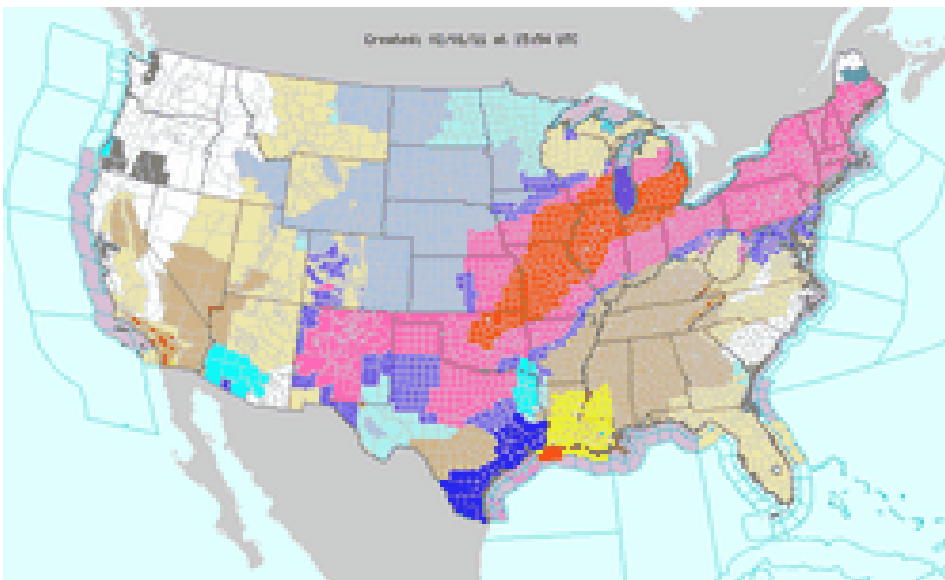


- **REPAIR:** WWA message improvements that could be implemented via policy and/or minor software change
- **REVAMP:** An overhaul and/or revisualization of the hazard messaging paradigm that would require major policy and infrastructure changes

We are getting ready to demonstrate both types of change!

REPAIR:

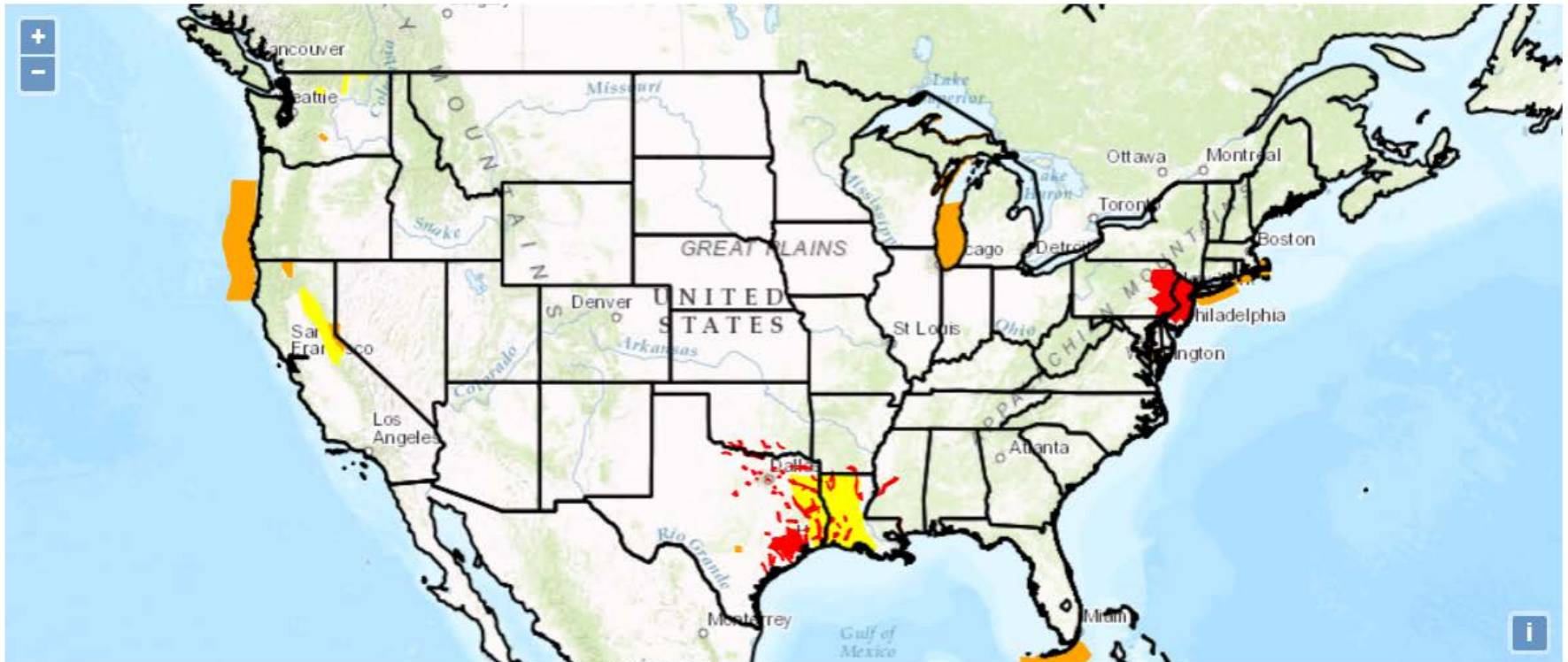
An Example of an Extremely "Busy" WWA Map



Hazard / Weather Event Click on the Hazard/Weather Event For Definitions	Color Sample			
Severe Weather Statement		Hurricane Force Wind Watch		Civil Emergency Message
Test		Flash Flood Statement		Lake Effect Snow Watch
Dust Storm Warning		Extreme Fire Danger		Wind Chill Warning
Extreme Cold Watch		Hazardous Seas Watch		Flood Statement
Low Water Advisory		Storm Warning		Typhoon Watch
Wind Chill Watch		Red Flag Warning		Excessive Heat Watch
Evacuation - Immediate		Heavy Freezing Spray Warning		Lakeshore Flood Watch
Tsunami Advisory		Ashfall Advisory		High Surf Advisory
Heat Advisory		Avalanche Warning		Winter Weather Advisory
Frost Advisory		Tropical Storm Warning		Lake Effect Snow Advisory
Typhoon Warning		High Surf Warning		Excessive Heat Warning
Freeze Warning		Tsunami Watch		Special Weather Statement
Lake Effect Snow Warning		Child Abduction Emergency		Lakeshore Flood Statement
High Wind Watch		High Wind Warning		Special Marine Warning
Ashfall Warning		Air Stagnation Advisory		Blizzard Warning
Blowing Dust Advisory		Blizzard Watch		Freezing Rain Advisory
Ice Storm Warning		Winter Storm Warning		Hazardous Weather Outlook
Extreme Wind Warning		Hazardous Materials Warning		Short Term Forecast
Tornado Watch		Dense Smoke Advisory		Wind Chill Advisory
Volcano Warning		Coastal Flood Advisory		Severe Thunderstorm Watch
Freezing Spray Advisory		Tropical Storm Watch		Marine Weather Statement
Hydrologic Outlook				
Fire Weather Watch				
Beach Hazards Statement				
				Avalanche Advisory
				Gale Watch
				Gale Warning
				Tornado Warning
				Heavy Freezing Spray Watch
				Freeze Watch
				Earthquake Warning
				Shelter In Place Warning
				Avalanche Watch
				Flood Watch
				Fire Warning
				911 Telephone Outage
				Dense Fog Advisory
				Hydrologic Advisory
				Winter Storm Watch
				Wind Advisory
				Freezing Fog Advisory
				Hazardous Seas Warning
				Tsunami Warning
				Hurricane Force Wind Warning
				Administrative Message

REPAIR:

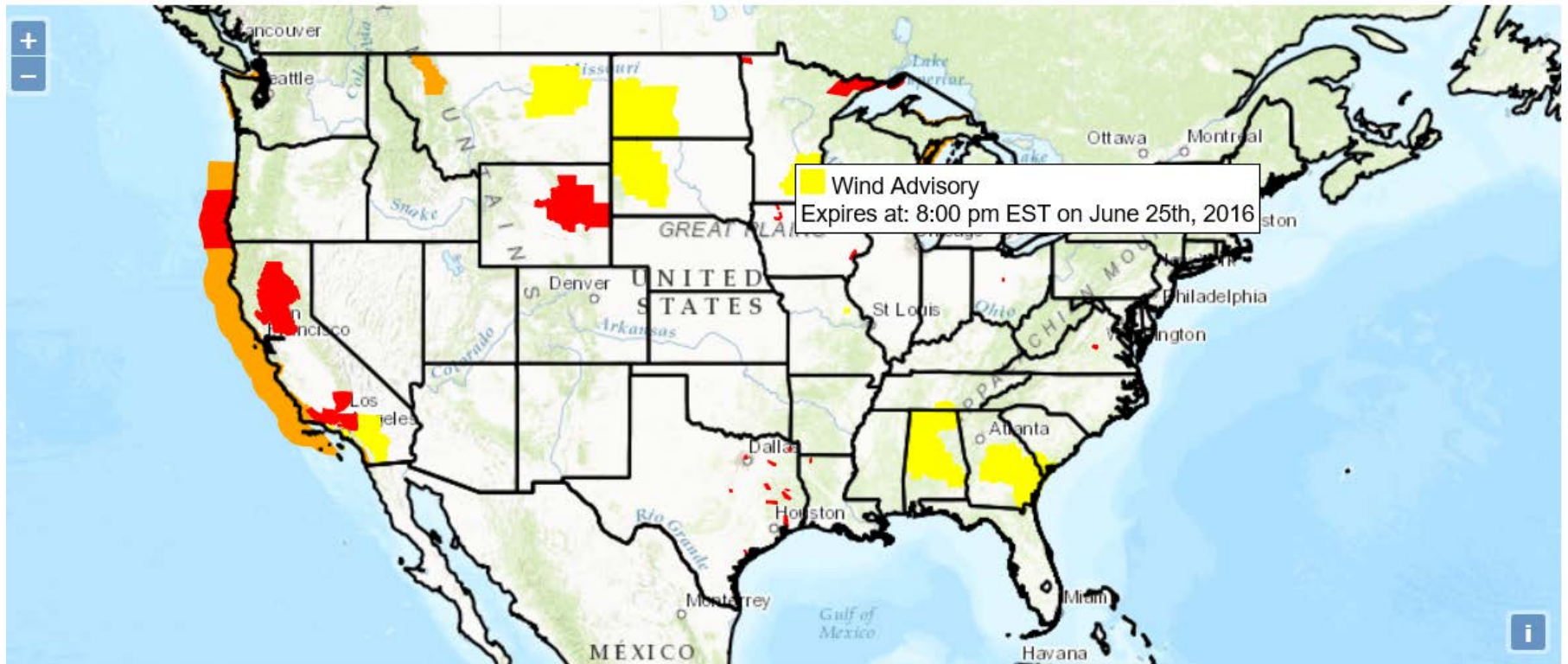
Idea #1A - 4 Color Hazard Map (WWA-Based)



Emergency Warning Watch Advisory

REPAIR:

Idea #1B - 4 Color WWA Map (Action-Based)



Urgent Take Action Be Aware Get Prepared

REPAIR:

Idea #2 – Watch and Advisory Consolidation

Current Flood Advisory Products

Urban and Small Stream Advisory

Small Stream Flood Advisory

Arroyo and Small Stream Advisory

Flood Advisory

Hydrologic Advisory

Consolidate To → **Flood Advisory**

Current Winter Advisory Products

Freezing Rain Advisory

Winter Weather Advisory

Freezing Rain Advisory

Wind Chill Advisory

Consolidate To → **Winter Weather Advisory**

REPAIR:

Winter Weather Advisory Example

Current Messaging

Urgent - Winter Weather Message
National Weather Service Baltimore MD/Washington Dc
129 AM EST Tue Jan 26 2016

**"Urgent"
Removed**



...Freezing Rain Advisory in effect until 11 AM EST this morning...

The National Weather Service in Baltimore MD/Washington has issued a Freezing Rain Advisory...which is in effect until 11 AM EST this morning.



**Remove Attribution
Line**

* Hazard Types...Spotty light freezing rain.

* Ice Accumulations...Generally trace amounts...with up to a few hundredths of an inch possible. Even a small amount of ice can cause significant safety issues.

* Timing...Overnight tonight through mid-morning Tuesday.

* Impacts...A light glaze of ice will make roadways and sidewalks slippery and hazardous. A thin layer of ice may be difficult to distinguish from a surface that is simply wet.

* Winds...South 5 To 10 mph with gusts up to 20 mph.

* Temperatures...In the teens and 20s early this morning...especially valley locations. Temperatures will rise above freezing by late morning.

Precautionary/Preparedness Actions... A freezing rain advisory means that periods of freezing rain or Freezing drizzle will cause travel difficulties. Be prepared for slippery roads. Slow down and use caution while driving.

Proposed Alternative

Winter Weather Message
National Weather Service Baltimore, MD/Washington DC
129 AM EST Tue Jan 26 2016

...Winter Weather Advisory in effect until 11AM EST this morning...

* Hazards...Spotty freezing rain, generally trace amounts... with up to a few hundredths of an inch...

Hazards First



* Impacts...A light glaze of ice will make roadways and sidewalks slippery and hazardous. A thin layer of ice may be difficult to distinguish from a surface that is simply wet.

**Impacts
Next**



* Timing... Overnight tonight through mid morning Tuesday.

* Winds...South 5 to 10 with gusts up to 20 mph

* Temperatures...In the teens and 20s early this morning...especially valley locations. Temperatures will rise above freezing by late morning.

Precautionary/Preparedness Actions...Be prepared for slippery roads; slow down and use caution when driving.

Shortened



REVAMP:

Prototype From Haz Simp Workshop - Eliminate Advisory & Watch; Delineate Warning Levels

CURRENT WWA	NEW HEADER	VERB/COLOR?	IMPACT
<i>Emergency</i>	Warning	Take Action	Widespread/Catastrophic
<i>Warning</i>		Take Action	Life-Threatening
<i>Advisory</i>		Take Action	Potentially Dangerous
<i>Watch</i>	Potential*	Prepare	Higher Risk
<i>Outlook</i>		Be Aware	Lower Risk

*Will replace some current advisories.

REVAMP:

Another Prototype From Haz Simp Workshop - Eliminate WWA Terms Entirely!

Wednesday October 28

Flood - Be Aware

- **What:** Heavy rain of 3-5"; low areas, creeks, streams and low water crossings may flood.
- **Where:** Much of central Texas including the Dallas/Fort Worth Metro area.
- **When:** Thursday, October 29 - Sunday, November 1
- **Actions:** Monitor local media; NWS at weather.gov/fwd.
- **Additional Details:** at weather.gov/fwd/flood.

Thursday October 29

Flood - Prepare Now

- **What:** Heavy rain of 4-6" forecast. Flooding of low areas, creeks, streams and low water crossings is anticipated. Roads may be closed due to flooding.
- **Where:** Much of central Texas including the Dallas/Fort Worth Metro area.
- **When:** early evening Friday, October 30 to early evening Saturday, October 31.
- **Actions:** Prepare to adjust travel plans. Stay away from rising rivers. Ranchers: move livestock out of floodplains.
- **Additional Details:** at weather.gov/fwd/flood.

Friday, October 30

Flood - Take Action

- **What:** Flooding is imminent along Tuttle Creek, Trinity River, and in urban areas of the Dallas/Fort Worth metroplex. Roads may be impassible on the west side of Dallas. Interstates may flood especially interchanges.
- **Where:** South Central Dallas County, eastern Denton County, including Dallas, Fort Worth, Plano, Arlington.
- **When:** Now until 2 pm CDT Saturday, October 31.
- **Actions:** Motorists need to avoid west Dallas. Stay away from rising rivers and creeks. Turn Around, Don't Drown!.
- **Additional Details:** at weather.gov/fwd/flood.

Latest “REPAIR” and “REVAMP” Timeline

- Release “Episodes” that adapt Workshop ideas to realistic scenarios across multiple hazards – gather public comment
- Collect comment on proposed repairs; implement change (and/or retain new ideas as alternatives) if feedback is positive



Jul: Collect comments on 4-Color maps, Winter Episode

Aug: Collect comments on “Consolidation” proposal,
Flooding Episode

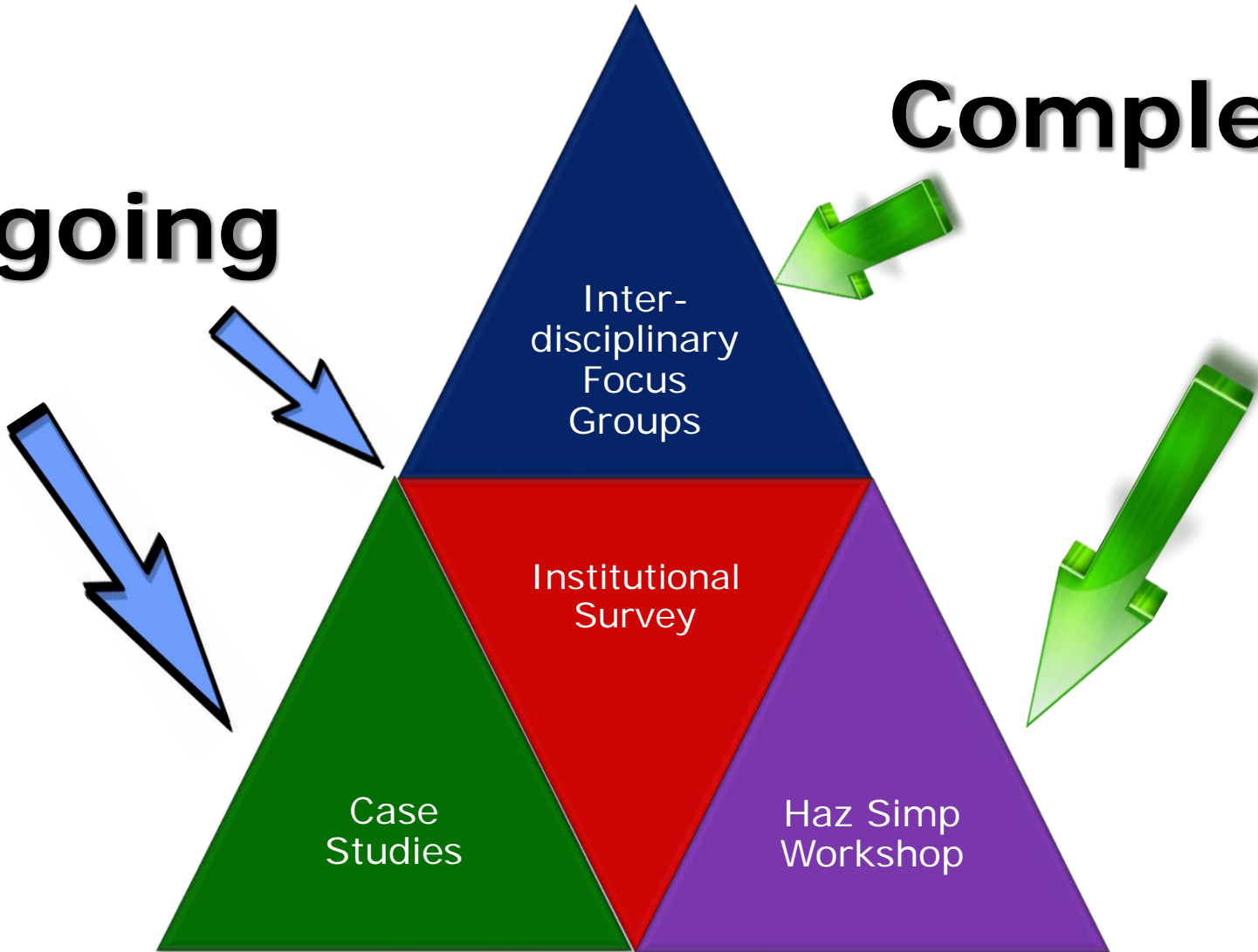
Sep: Excessive Heat Episode

By Nov: Goal to implement consolidation, Severe Episode

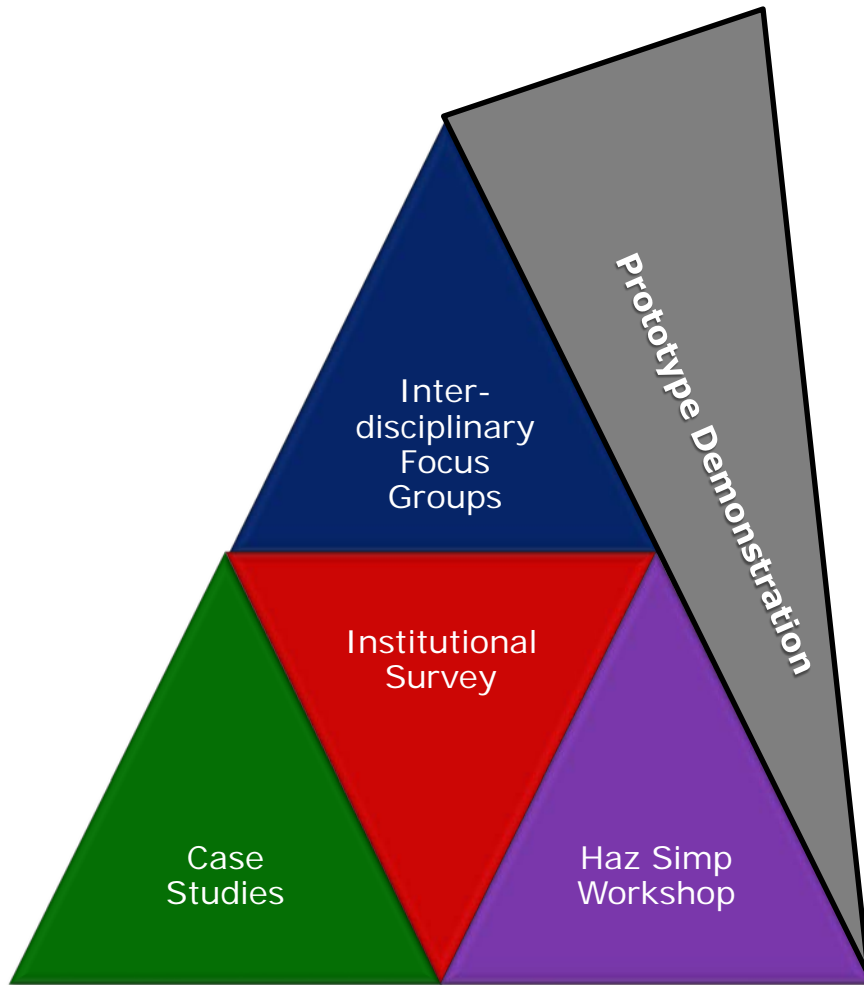
Rolling It All Together: "Triangulating" the Data

Ongoing

Completed



Rolling It All Together: *We'll Integrate the Prototype Demo Too!*



With everything considered together, the plan is to create a single prototype for the 2017 Generalizable Survey

Summary

- The “Repair” and “Revamp” comment opportunities will be widely publicized; possibly implement Repairs this year
- Also plan to analyze Institutionalization survey data and final Case Study survey report
- Generalizable survey planned next year to assess favored prototype(s) as compared to WWA
- Major effort required if any major change is contemplated (software, dissemination, policy). Must proceed carefully!

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