



An Overview of the National Weather Service's Hydrologic Services Program in Nevada and Eastern California

Gary Barbato, Senior Service Hydrologist, NWS Reno, NV



**USGS Streamgauge Cooperators' Workshop
Carson City, NV
January 21, 2010**



Outline...

- **NWS Hydrologic Services Program...**
 - *Mission and Responsibilities...*
- **Impacts of Floods in the United States...**
- **Program Structure...**
- **NWS Hydrologic Products...**
- **Program Partners in NV and E CA**



NWS Weather Reno's Mission:

- **Provide weather, hydrologic and climate forecasts and warnings for the residents of western Nevada and the eastern Sierra for the protection of life and property.**
- **Provide hydrometeorological data and forecast information to our partners and users in the public and private sectors.**
- **Data and products from WFO Reno are part of a national information database and infrastructure which can be used by other government agencies, the private sector and general public.**



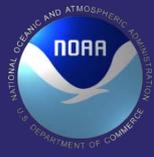
Four Basic Functions of NWS Weather Forecast Offices (WFOs):

- **Continuous hydrometeorological data assimilation, modeling, analysis and forecast preparation.**
- **Coordination with adjacent forecast offices and national centers to provide seamless and credible products.**
- **Technical support and interaction with other agencies and users involved in the protection of life and property.**
- **Applied research, development and technological implementation to facilitate and support the above functions.**



Mission of NWS's Hydrologic Services Program

- ✓ *To provide river and flood forecasts and warnings for protection of life and property*
- ✓ *Provide basic hydrologic forecast information for the nation's economic and environmental well being.*



Vision of WFO Reno Hydrologic Services Program:

To increase awareness and value of NWS hydrologic services in western Nevada and eastern California...

...so WFO Reno is recognized by its customers, partners and the general public as the best source for hydrologic forecast and warning information.



NWS Hydrologic Services Program...

Primary Responsibility:

- That WFO Reno staff use necessary guidance and data to issue timely, accurate and concise flood and flash flood warnings and statements.
- Having this ability requires...
 - *Staff training in specific hydrologic operations of the office as well as general hydrologic principles;*
 - *Maintenance of hydrologic instructions and procedures;*
 - *Quality control of all hydrologic data and guidance.*
 - *Ensuring hydrologic data and guidance give a clear understanding of the hydrologic situation so quick, accurate decisions can be made;*
 - *Ensuring instrumentation, hardware and software used to provide, transmit, receive and display hydrometeorological data, guidance and warning products are working properly.*



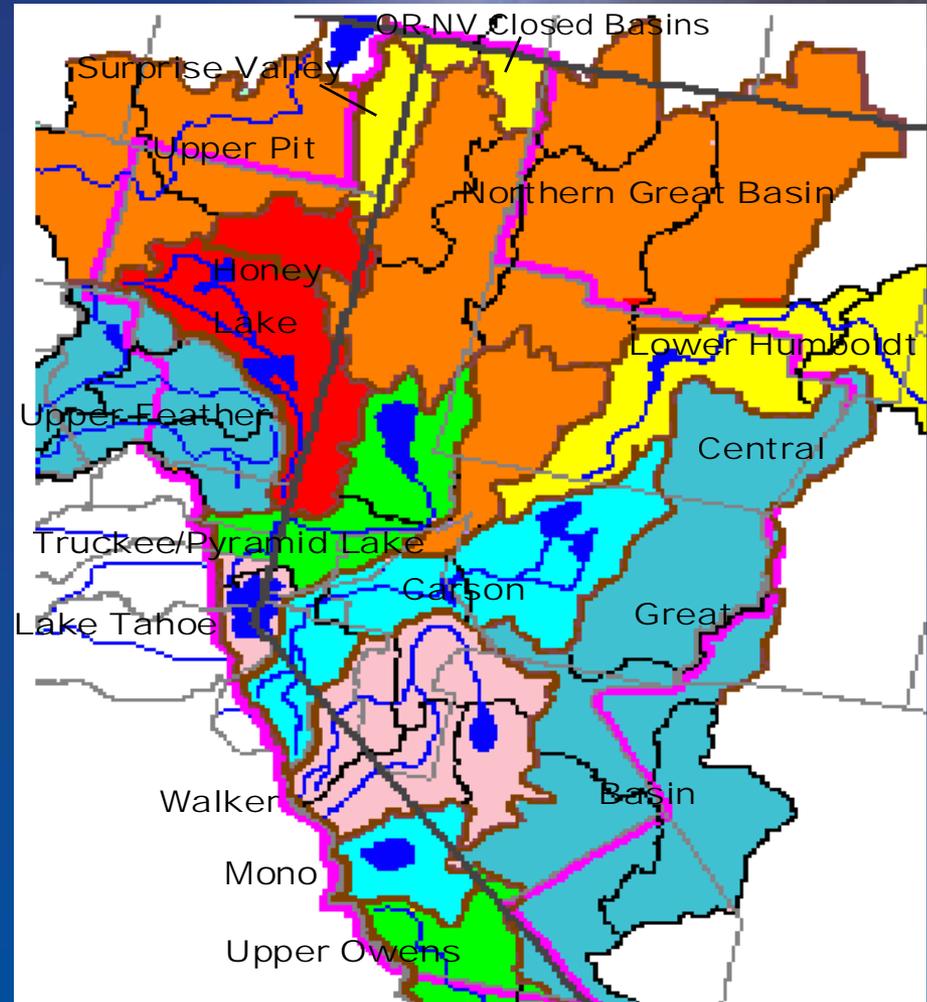
Close Working Relationships with Federal, State and Local Agencies and the Media in the Hydrologic Services Area...

- *...are extremely important to ensure NWS hydrologic products are received, understood, and properly acted upon by emergency services agencies, the media, and the general public.*



Physiography of REV HSA...

- HSA all in Great Basin except...
 - Portions of Pit and Feather Basins (in Lassen, Plumas and Sierra Counties) which are in the Sacramento River drainage.
 - Pit and Feather Basins are wettest, as are upwind of Sierra/Cascade Crest.
- 14 major basins...
 - Only 8 have significant rivers.
- Over 50 large valleys, none drain to Pacific except for Pit and Feather Basins.





History of NWS HSP at REV...

- **History of Reno Weather Observation and Office Locations...**
 - *Observations began Dec. 1, 1870 at SPRR downtown rail depot, continuing through 1887 at that location.*
 - *UNR began taking observations on Jan. 1, 1888, continuing there through Nov. 1905.*
 - *First WB Office (WBO) in Reno established November 11, 1905 at First and Virginia Streets, downtown.*
 - *First 3 WBO sites were at various downtown locations, through Aug. 31, 1942*
 - *Reno Airport WBO opened January 8, 1931 with 24-hr duty including hourly weather, public service and twice daily upper air observations.*
 - *Concurrent NWS operations downtown and at airport from 1/8/1931 to 8/31/1942*
 - *Airport became official observation and WBO site on 9/1/1942.*
 - *Airport continues as official observation site through today.*
 - *NWS Office moved from airport to current location in September, 1994.*



History of NWS HSP at REV...

- **NWS Reno “River District Office” (RDO) established Feb. 1, 1951, less than 3 months after the disastrous Nov. 21, 1950 region-wide floods.**
 - *First River District Service Manual dated 1954.*
 - *Original forecast point: Truckee River @ Virginia St. Bridge @ Reno, using procedures developed by Northwest (Portland) RFC.*
 - **Northwest RFC (founded 1948, RFC status in 1950) had original river forecast responsibility for the area.**
 - **“Salt Lake City Water Supply Forecast Unit” (founded 1947) had water supply forecast responsibility for the Great Basin portion of the area, which was handed over to CNRFC in 1979.**
 - *Original area of responsibility included Truckee, Carson, Walker, Susan, Humboldt and Quinn River Drainages.*



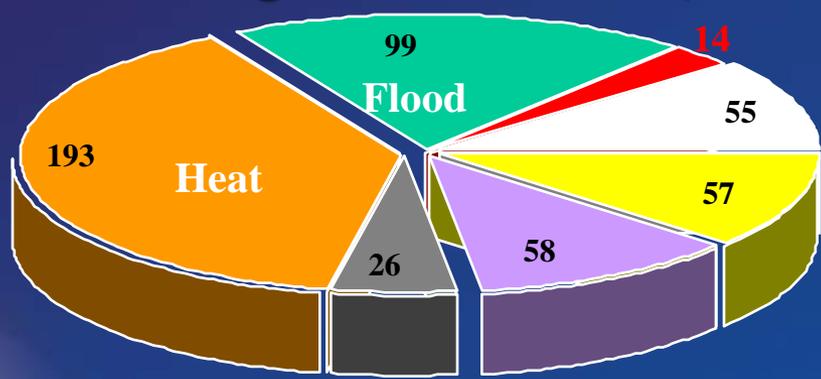
History of NWS HSP at REV...

- **CNRFC took over responsibility for forecasting eastern Sierra and Nevada rivers from NWRFC in 1963.**
- **CNRFC took over water supply forecasting responsibilities for Great Basin drainages from CBRFC in 1979.**
- **Meteorologist-in-Charge shared hydro duties with other staff members from 1951 until first SH position was established in 1992.**



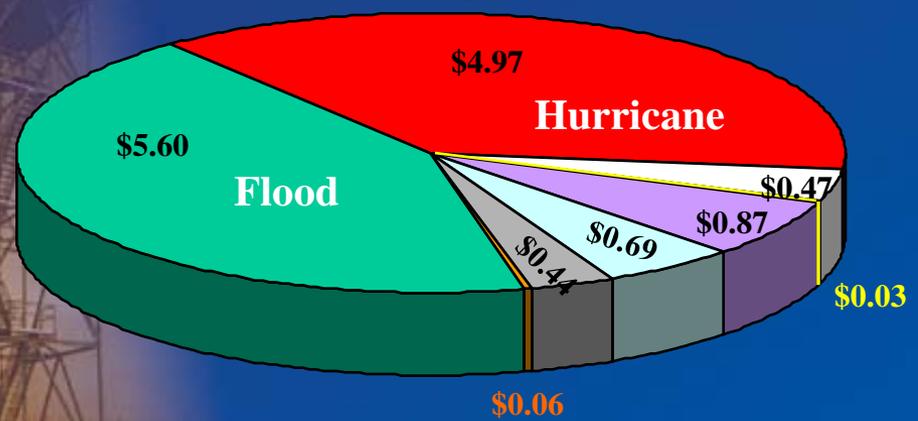
Impacts of Natural Disasters United States of America

Average Annual Deaths (1990-99): 502



- Flood
- Hurricane
- Winter Storm
- Lightning
- Tornado
- Hail
- Cold
- Heat

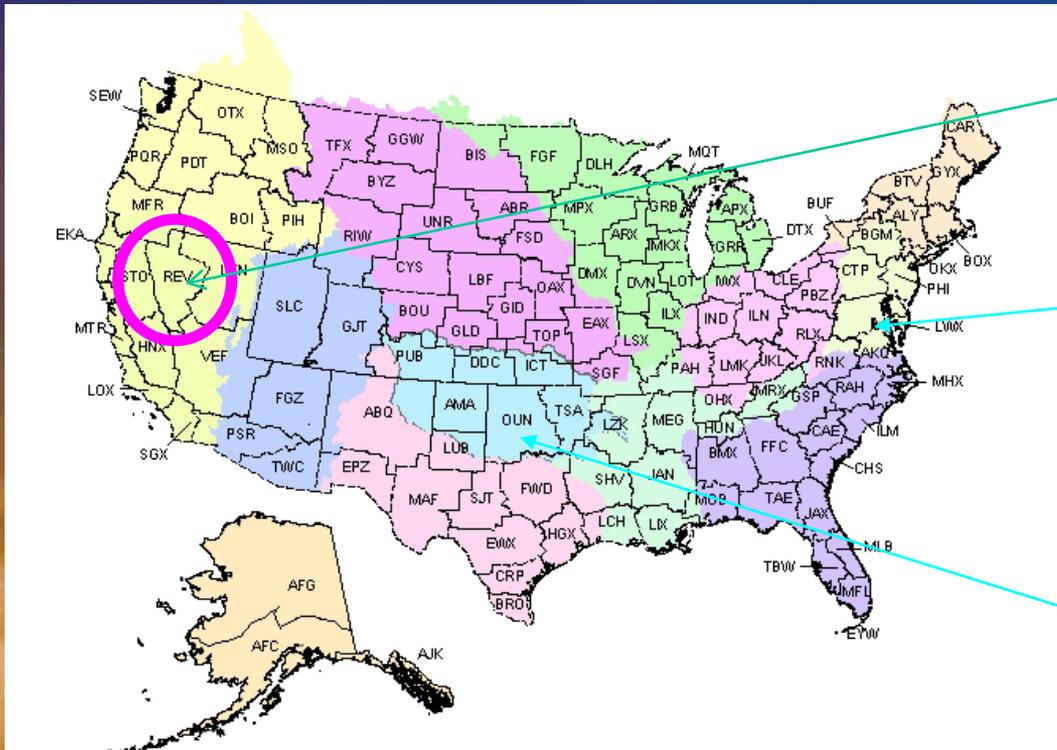
Average Annual Damages (1990-99): \$13.1 Billion





Hydrology Program Field Office Support

Services provided through collaborative efforts of National Centers, River Forecast Centers (RFCs), and Weather Forecast Offices (WFOs)



**WFO Reno
(REV)**

**Hydrometeorological
Prediction Center (HPC)
Camp Springs, MD**

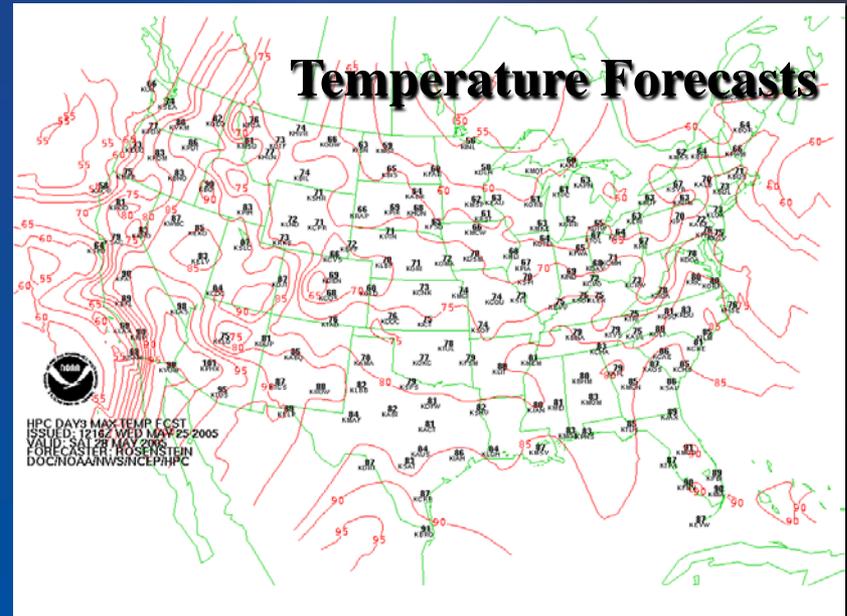
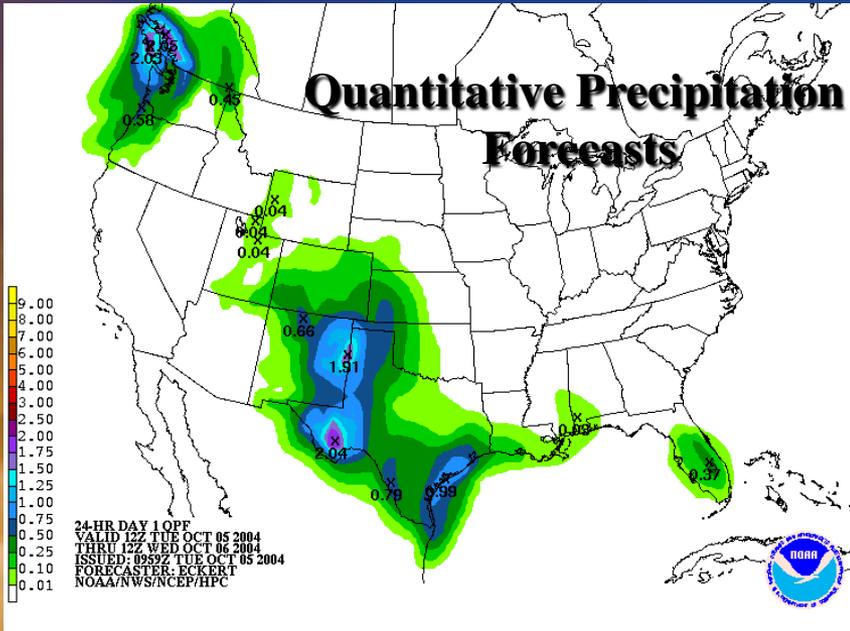
**Storm Prediction Center
(SPC)
Norman, OK**



Flood Warning Mission

1. National Hydrometeorological Prediction Center

<http://www.hpc.ncep.noaa.gov/>

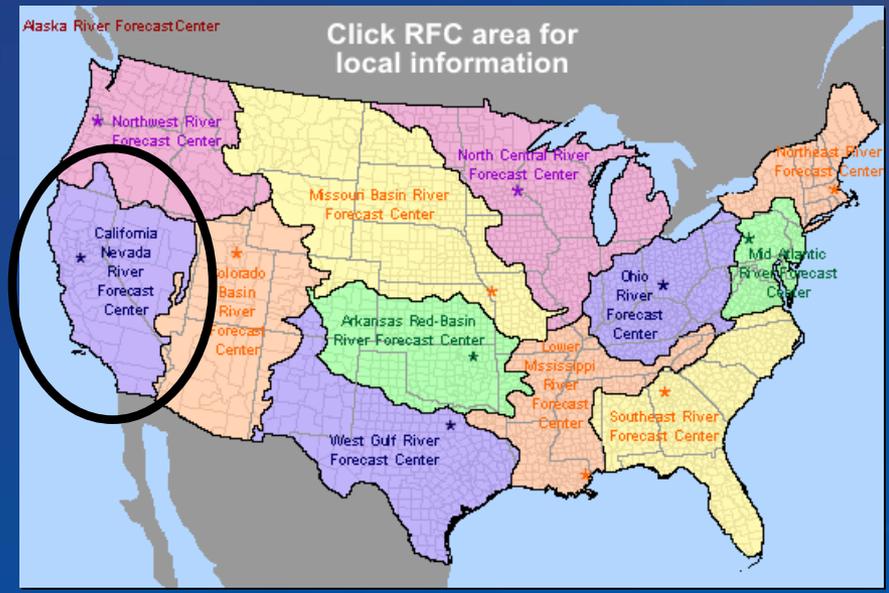




Flood Warning Mission...

2. River Forecast Centers (RFCs) :

- *Calibrate, maintain and run hydrologic model...*
 - **NWSRFS; CNRFC migrating toward Community Hydrologic Prediction System (CHPS, by 10/2010)**
 - *CHPS will allow better collaboration with partners & researchers ; make it easier to infuse new methodologies.*
- *Produce meteorological (QPF and temperature) and hydrologic forecasts, which are provided to users.*





Flood Warning Mission

3. Weather Forecast Offices (WFOs)

- *Customer outreach*
- *Field work to keep information up to date (flood stage, impacts, etc..)*
- *Monitor situation*
- *Issue flood outlook, watches and warnings based on forecasts from the River Forecast Centers.*



Some of WFO REV's Hydrologic Partners...

- **Bureau of Indian Affairs, Dam Safety Division, Carson City & Phoenix Arizona**
- **Bureau of Reclamation, Lahontan Basin Area Office (Carson City) and Mid Pacific Regional Office (Sacramento)**
- **California Dept. of Water Resources**
- **California Office of Emergency Services**
- **City Emergency and Public Works Managers; Police:**
 - *Carson City, Fallon, Portola, Reno, Sparks, Susanville, Truckee, Tahoe City, S Lake Tahoe*
- **County Emergency and Public Works Managers, Sheriff**
- **Desert Research Institute, Western Region Climate Center**
- **Natural Resources Conservation Service**
- **Nevada Department of Water Resources, State Engineer's Office**
- **Nevada Office of Emergency Management**
- **News Media (TV, Radio, Newspapers)**



Some of WFO REV's Hydrologic Partners (cont.)...

- **Pershing County Water Conservation District**
- **Truckee-Carson Irrigation District**
- **U.S. Army Corps of Engineers, Sacramento**
- **U.S. District Court Water Master, Reno (Truckee and Carson Rivers)**
- **U.S. Geological Survey, Carson City NV & Carnelian Bay, CA**
- **University of Nevada, Reno, Emergency Management Coordinator**
- **University of Nevada, Reno, Cooperative Extension**
- **Truckee Meadows Water Authority**
- **Truckee River Flood Management Project**
- **Walker River Irrigation District**
- **Walker River Federal Water Master**
- **Walker River Paiute Tribal Water Master & Police**
- **Washoe County Dept. of Water Resources**



3 Types of Flooding...

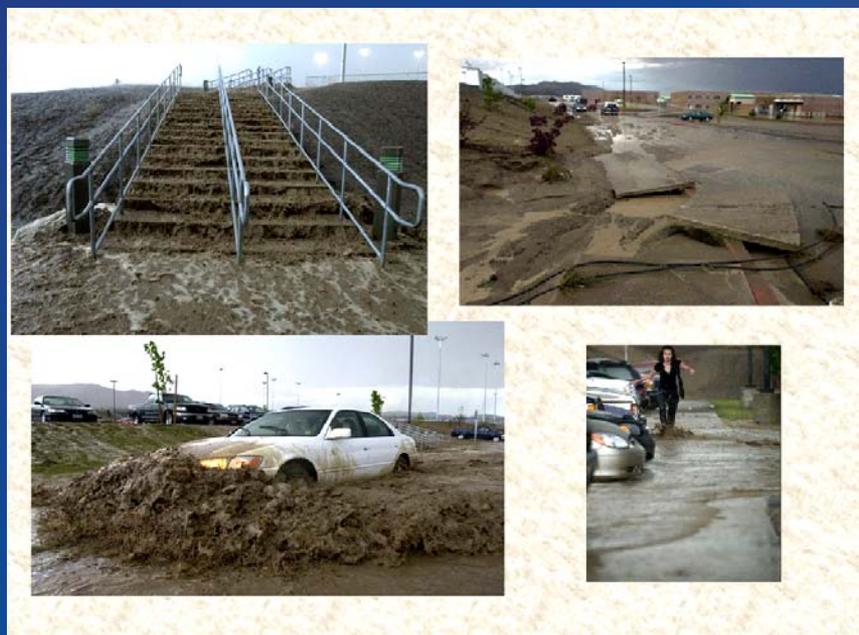
Flash, Forecast Point & Areal...





1) NWS Flash Flood Products...

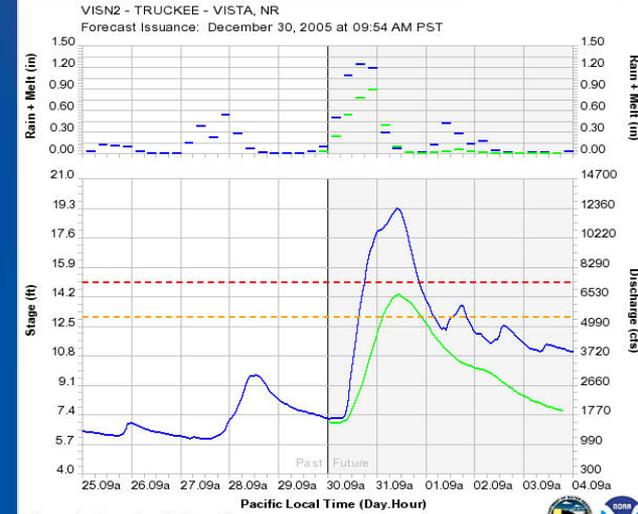
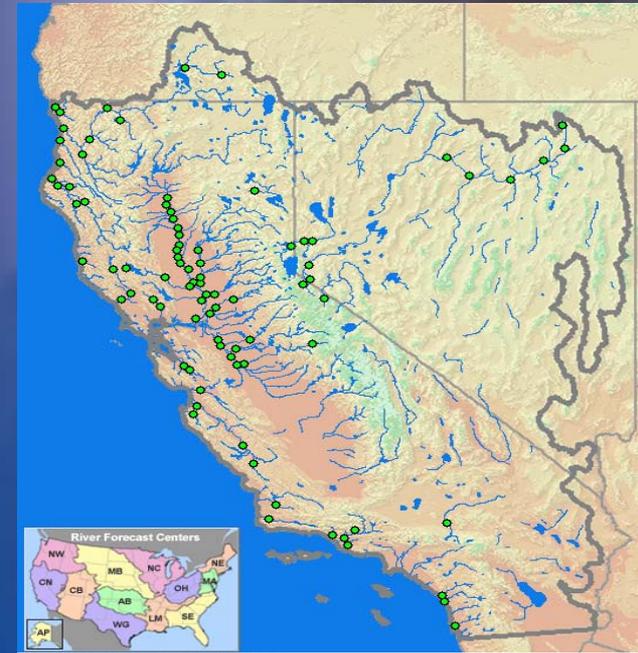
- **Are issued for life-threatening floods which occur in <6 hrs from the causative event!!**
- Floods which require **immediate action** to protect lives and property:
 - Dangerous flooding of streams, washes, alluvial fans (overland flooding) or urban areas...due to heavy rain.
 - Flash flooding can occur with lower precipitation intensities in winter and spring than summer due to moist or frozen soils, lack of vegetation, snow cover, etc.
 - Dam or levee failures...can happen anytime, even a clear day or night!





2) Forecast Point Flood Products...

- Flood products which include a **quantified value** (from a River Forecast Center forecast) and **impact information**:
 - For specific locations;
 - Applicable to specific reaches (area along river up and downstream of forecast point);
 - For flooding which is expected to occur in >6 hrs from causative event.





3) “Areal” Flood Products:

- **Issued for flooding which is:**
 - *Occurring or expected in a defined area such as counties or portions of counties, urban and/or small stream areas, areas along rivers or streams which threaten lives and property.*
 - *Not appropriately covered by Flash Flood or Forecast Point Flood Products.*
 - *For flooding which is expected to occur in >6 hrs from causative event.*





Types of Hydrologic Products...





Flood Outlook: *GET READY!*



- Flood Outlook

- *Flooding possible in >48 hrs to ~7 days
...issued with greatest lead time
feasible!...with confidence >50%!*
- Hazardous flooding event *may develop.*
- Provides information to those who need
considerable lead time to prepare for an
event.



Flood Watch: GET SET!!



- Flood Watch

- *Flooding possible in:*

- 6 to 48 hours for Flash Flooding;
- 1 to 3 days (up to 4 days if likely) for Areal, Forecast Point Flooding.

- Expectation of a flood event **has increased, but its occurrence, location, and/or timing is still uncertain.**
- Provides enough lead time so those who need to set their mitigation plans in motion can do so.



Flood Warning:



GO!!!



Flash Flood Warning:

- Flash flooding imminent or likely.
- Reserved for short-term events which require immediate action to protect life and property; e.g., dangerous small stream or urban flooding and dam or levee failures.
- Emergency Alert System always activated!



Flood Warning:

- Flooding **forecast** on rivers and streams (forecast point or areal flooding) in ≤ 24 hrs (up to 36 hours if likely), or is **already occurring**.
- Emergency Alert System only activated at forecaster/Emergency Manager discretion...



Advanced Hydrologic Prediction Service (AHPS)



AHPS Purpose:

- Provides hydrologic observation and forecast products to aid decision-makers in the mitigation of floods and drought.
- Provides planning tools to emergency managers, government, private institutions and individuals for decision-making before and during floods and drought.
- The results of these decisions may include:
 - *Evacuation of individuals and livestock...*
 - *Transfer of property to higher elevations...*
 - *Sandbagging or flood-proofing efforts...*
 - *Changes to reservoir operations.*

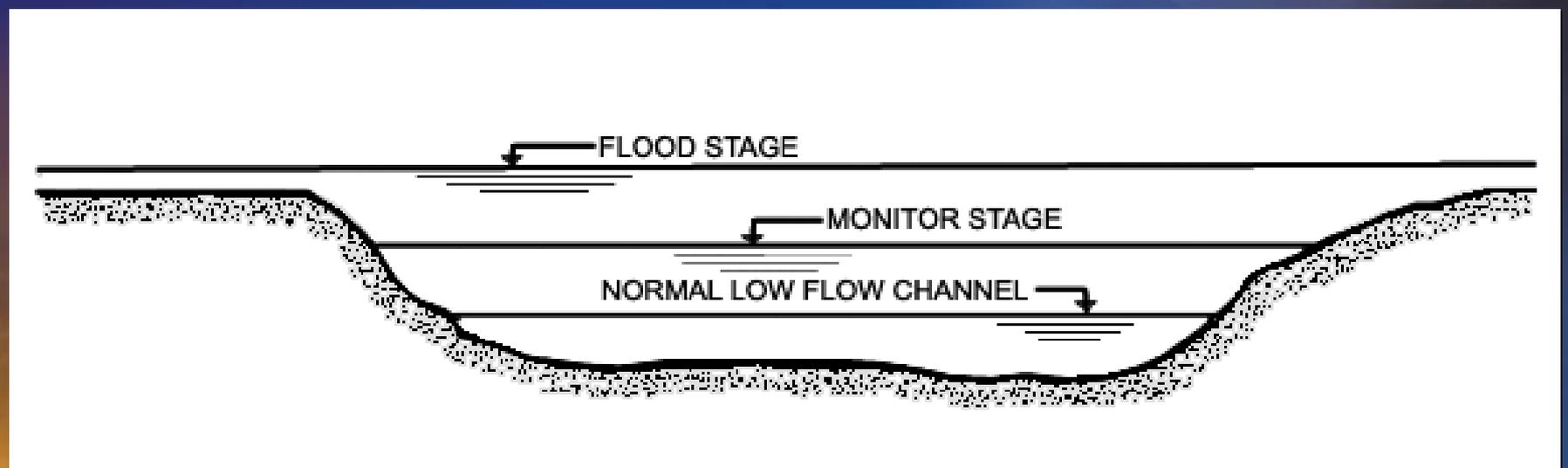


AHPS Products Include...

- Hydrographs of observed (blue) and forecast (green) data.
- Key stages at each gage placed on or below hydrograph (dependent on current stage) :
 - *Action or Monitor Stage: No flooding, but preparedness plans should be put into effect if river continues to rise.*
 - *Flood Stage: Some minor flooding begins in gage's reach (portion of the river that the gage represents). Always included on hydrograph, if assigned.*



Monitor and Flood Stage...





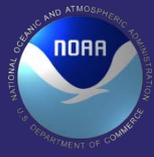
Key Stages Included on AHPS (cont.)

- **Moderate Flooding:** *Some inundation of structures and roads near streams. Some evacuations of people and/or transfer of property to higher elevations.*
- **Major Flooding:** *Extensive inundation of structures and roads. Significant evacuation of people and/or transfer of property to higher elevations.*
- **Record Flood:** *Largest known flood at location.*



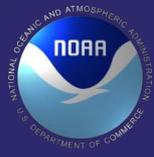
AHPS Includes...

- **Table and hydrograph of past and forecast data;**
- **Map of the area around the gage;**
- **List of highest/lowest flows;**
- **Impacts of various river/stream stages in the portion of the river that the gage represents;**
- **Text versions of Flood Warnings and Statements.**



AHPS Includes...

- **Probabilistic long range forecasts for select sites:**
 - *Used in risk-management and water supply planning.*
 - *The chance of a river exceeding minor, moderate, major flood stage.*
 - *The chance of a river rising above or falling below a certain level, volume or flow at specific points during 90 day periods.*
 - *Probabilistic forecasts (out to 1 year) are also available from CA-NV River Forecast Center website.*



WFO Reno AHPS Website

(weather.gov/Reno --> Rivers and Lakes AHPS)

Includes...

- 54 River and reservoir gages in the Reno Hydrologic Services Area
- 8 River forecast points (more planned)
- 6 Probabilistic Forecast Points



weather.gov/reno → River & Lake AHPS

National Weather Service - Reno, NV - Mozilla Firefox

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http://www.wrh.noaa.gov/rev/

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National Weather Service - Reno, NV

National Weather Service Forecast Office
Reno, NV

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Tabular State
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Hydrology
Probabilistic QPF
Seasonal Outlook
Forecast Weather
Tables
Graphical Fcsts

Top News of the Day

- Web Briefing - Updated Tuesday at 1 PM **NEW**
- Water Supply Outlook for Nevada and Eastern California **NEW**

Last 30 Products Issued Forecast by City

Western Nevada Weather [Map FAQs](#) | [Glossary](#)

Click on the map below for the latest forecast.

Read watches, warnings & advisories [Zoom Out](#)

- Winter Storm Warning
- High Wind Warning
- Storm Warning
- Avalanche Warning
- High Surf Warning
- Gale Warning
- Winter Weather Advisory
- Flood Advisory
- Small Craft Advisory
- Lake Wind Advisory
- Wind Advisory
- Winter Storm Watch
- High Wind Watch
- Coastal Flood Watch
- Special Weather Statement
- Hazardous Weather Outlook



"City, ST"
City, ST Go

Adjacent Areas:
Map navigation controls (Zoom In, Zoom Out, etc.)

- National Conditions
Rivers
Satellite
Climate
Observed Precip

- Local Conditions
Warnings
Weather Forecast
Radar

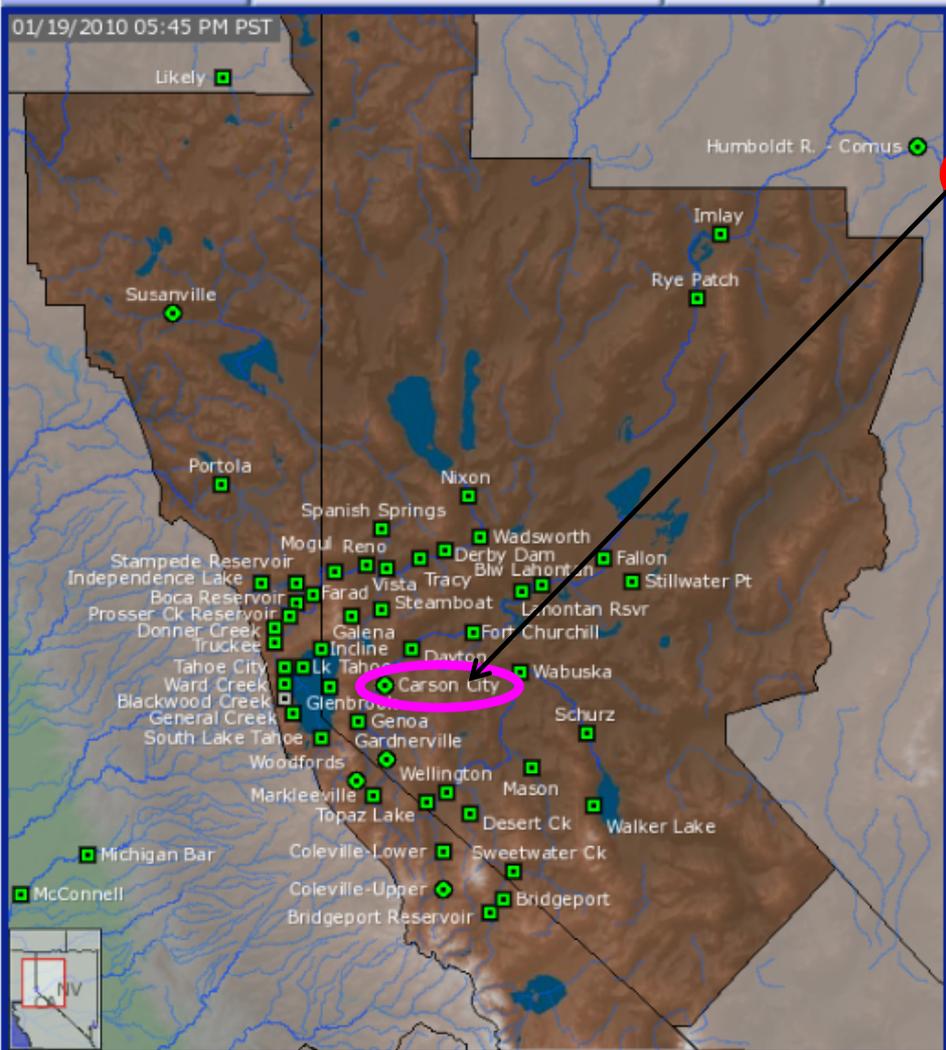
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River Observations River Forecasts Within 48 Hours Precipitation Download



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Map Legend
Hydrograph Available
Probability and Hydrograph Available
Major Flooding
Moderate Flooding
Minor Flooding
Near Flood Stage
No Flooding
Observation More Than 24 Hours Old
Out of Service

- Topo Gauges Counties States Major Rivers Other Rivers Highways Cities
HSA Names Names Names

Done



National Weather Service Advanced Hydrologic Prediction Service

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Winter Weather Advisory
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 - Observed Precip

- Local Conditions
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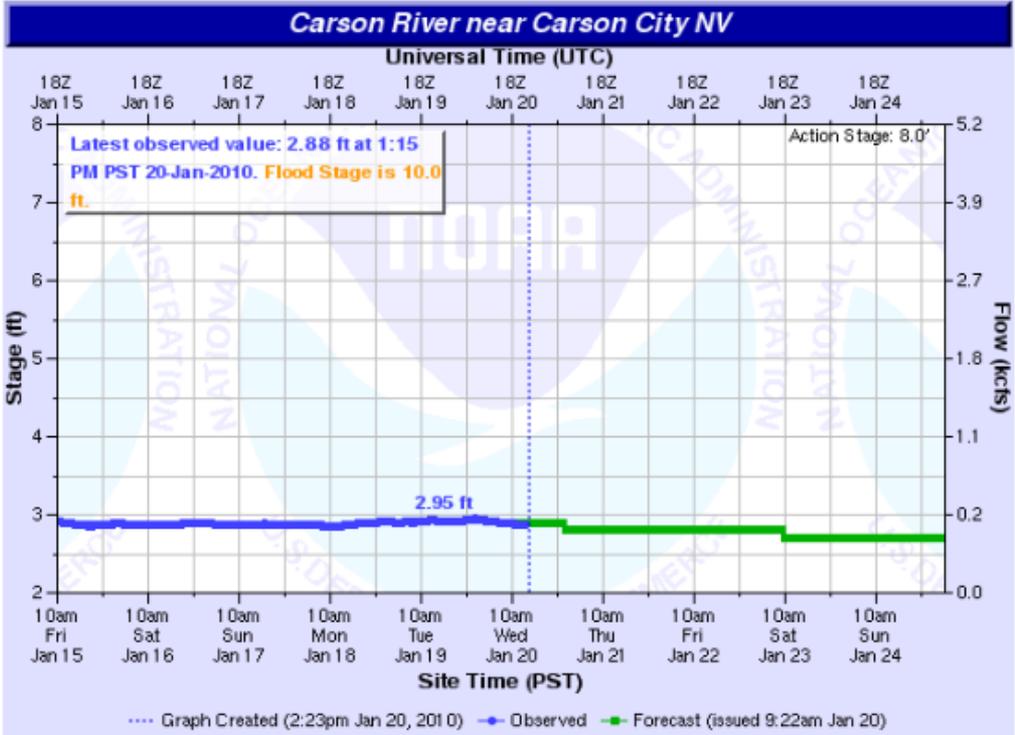
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Observations courtesy of

- Hydrograph
- River at a Glance
- Download
- Weekly Chance of Exceeding Levels
- Chance of Exceeding Levels During Entire Period



STWN2 (plotting HGIRG) "Gage 0" Datum: 4620.48' Observations courtesy of the US Geological Survey

[Printable Image](#) **NOTE: Gauge reading may be affected by ice.** [Default Hydrograph](#)

[About this graph](#)

<http://waterdata.usgs.gov/nv/nwis/rt>



Note that historic crest (and minimum) stage values are derived by converting historic flows to stage using current USGS rating...

Flood impacts given for every half foot of stage from monitor to record flood.

Water Data for USGS ... Advanced Hydrologic Prediction ... eas - Google Search

Graph Created (2:23pm Jan 20, 2010) Observed Forecast (issued 9:22am Jan 20)

STWN2 (plotting HGIRG) "Gage 0" Datum: 4620.48' Observations courtesy of the US Geological Survey

Printable Image About this graph Tabular Data XML RSS Datum: NGVD29 Metadata

NOTE: Gauge reading may be affected by ice. Default Hydrograph Return to Area Map

Reliability of the Forecast: Based on current and forecast river, weather and reservoir conditions

NOTE: Forecasts for the Carson River near Carson City are issued routinely year-round.

Upstream Gauge Downstream Gauge

Flood Categories (in feet)

Major Flood Stage:	11
Moderate Flood Stage:	10.5
Flood Stage:	10
Action Stage:	8

Historical Crests

- 17.22 ft on 01/03/1997
- 17.10 ft on 12/24/1955
- 14.91 ft on 02/01/1963
- 12.83 ft on 11/22/1950
- 11.96 ft on 02/18/1986

Show More Historical Crests

Low Water Records

- 0 ft on 09/05/1992
- 0 ft on 09/01/1989
- 0 ft on 09/05/1994

Show More Low Water Records

Flood Impacts Collapse

18.0 INCREDIBLE FLOOD with damage previously unknown from the Carson Valley to Fort Churchill, including the Carson City and Dayton areas. About 34000 cfs, with about a one in 100 chance of occurring any year.

17.0 RECORD FLOODING. All towns along the Carson River above Lahontan Dam are cut off, with bridges and roads destroyed, and heavy damage to homes, businesses, infrastructure. About 30000 cfs with about a one in 85 chance of occurring any year.



- Churchill, Nevada, including Carson City and Dayton. Almost all roads in valley areas flooded making transportation very difficult. Massive erosion with large agricultural losses, possible livestock drownings if they have not been moved to high ground. About 14600 cfs with about a one in 22 chance of occurring any year.
- 12.0 EXTENSIVE FLOODING WITH MAJOR DAMAGE to roads, bridges and structures from Genoa to Fort Churchill, Nevada, including Carson City and Dayton. Almost all roads in valley areas flooded making transportation very difficult. Massive erosion with large agricultural losses, possible livestock drownings if they have not been moved to high ground. About 13300 cfs with about a one in 20 chance of occurring any year.
- 11.5 MAJOR FLOODING WITH SIGNIFICANT DAMAGE to roads, bridges and structures from Genoa to Fort Churchill, Nevada, including Carson City and Dayton. Most roads in valley areas flooded making transportation very difficult. Massive erosion with large agricultural losses, possible livestock drownings if they have not been moved to high ground. About 12100 cfs with about a one in 18 chance of occurring any year.
- 11.0 MAJOR FLOODING. Many roads, highways, homes and structures flooded from Genoa to Fort Churchill, Nevada, including Carson City, Stewart, Empire and Dayton. Transportation becoming difficult, and US Hwy 395 is closed. Massive bank erosion possible with capability of washing away buildings, roads, heavy machinery. River channel begins to move around laterally. About 10900 cfs, with about a one in 15 chance of occurring any year.
- 10.5 MODERATE FLOODING from Genoa to Fort Churchill, Nevada, including Carson City and Dayton. Damage to roads, bridges, crops, irrigation systems and buildings in lower areas. Several homes and businesses flood in lower parts of Genoa, Carson Valley, Stewart and Dayton. Transportation begins to be affected, with water flowing over US Hwy 395 in places. About 9800 cfs, with about a one in 12 chance of occurring any year.
- 10.0 FLOOD STAGE. MINOR FLOODING of lower portions of flood plain from Genoa to Fort Churchill, Nevada, including Carson City and Dayton. River begins to go out of banks at this stage. Several homes begin to have flood problems in Genoa, Carson Valley, Stewart and Dayton. Minor to moderate damage to agriculture. About 8800 cfs with about a one in 10 chance of occurring any year.
- 9.5 MINOR LOWLAND FLOODING in flood prone areas along river from Genoa to Fort Churchill, Nevada, including Carson City and Dayton. About 7800 cfs with about a one in 8 chance of occurring any year.
- 9.0 MINOR LOWLAND FLOODING in lower reaches from Genoa to Fort Churchill, including Carson City and Dayton, Nevada. Sandbagging necessary in some of the lowest areas, though most flooding limited to pasture areas along river. About 6900 cfs with about a one in 7 chance of occurring any year.
- 8.5 VERY MINOR LOWLAND FLOODING from Genoa to Fort Churchill, including Carson City and Dayton, Nevada. Sandbagging necessary in Willow Bend area near Genoa or flooding of homes may occur. About 6000 cfs with about a one in 6 chance of occurring any year.
- 8.0 MONITORING STAGE. Flood threat and localized overbank flows begin in lowest areas from Genoa to Fort Churchill, including Carson City and Dayton along the Carson River. Especially flood prone areas include: lower Carson Valley, the Willow Bend area of Genoa; the Empire, Stewart, and Mexican Dam areas, Pinion Hills and Brunswick Canyon. Preparations for flooding should begin in these areas if river forecast to exceed flood stage. About 5200 cfs with about a one in 5 chance of occurring any year.

Weather Forecast Office Reno, NV California Nevada River Forecast Center

This probabilistic forecast is issued by the California Nevada River Forecast Center.

- Hydrograph
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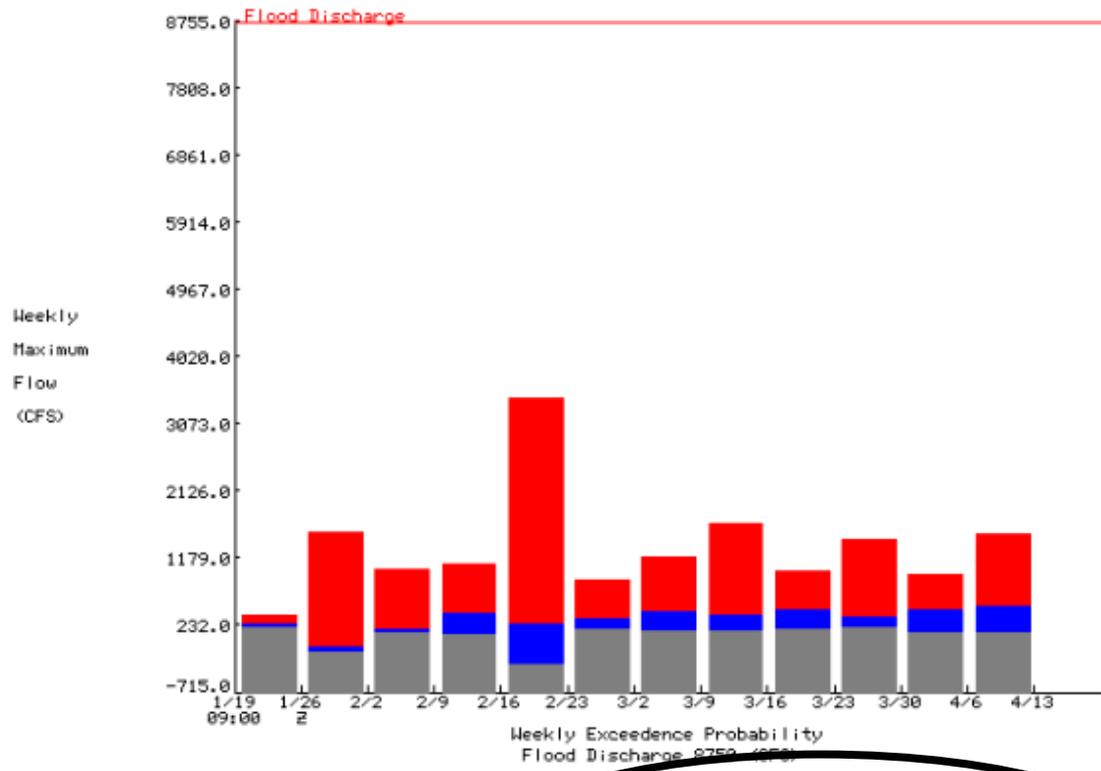
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Observations courtesy of



Carson R - Carson City
Latitude: 39.1 Longitude: 119.7
Forecast for the period 1/19/2010 - 4/13/2010
This is a conditional simulation based on the current conditions as of 1/19/2010



Exceedance Probability

- 10 - 50%
- 50 - 90%
- >= 90%



About this graph

NOTE: Gauge reading may be affected by ice.

Forecasts for the Carson River near Carson City are issued routinely year-round.

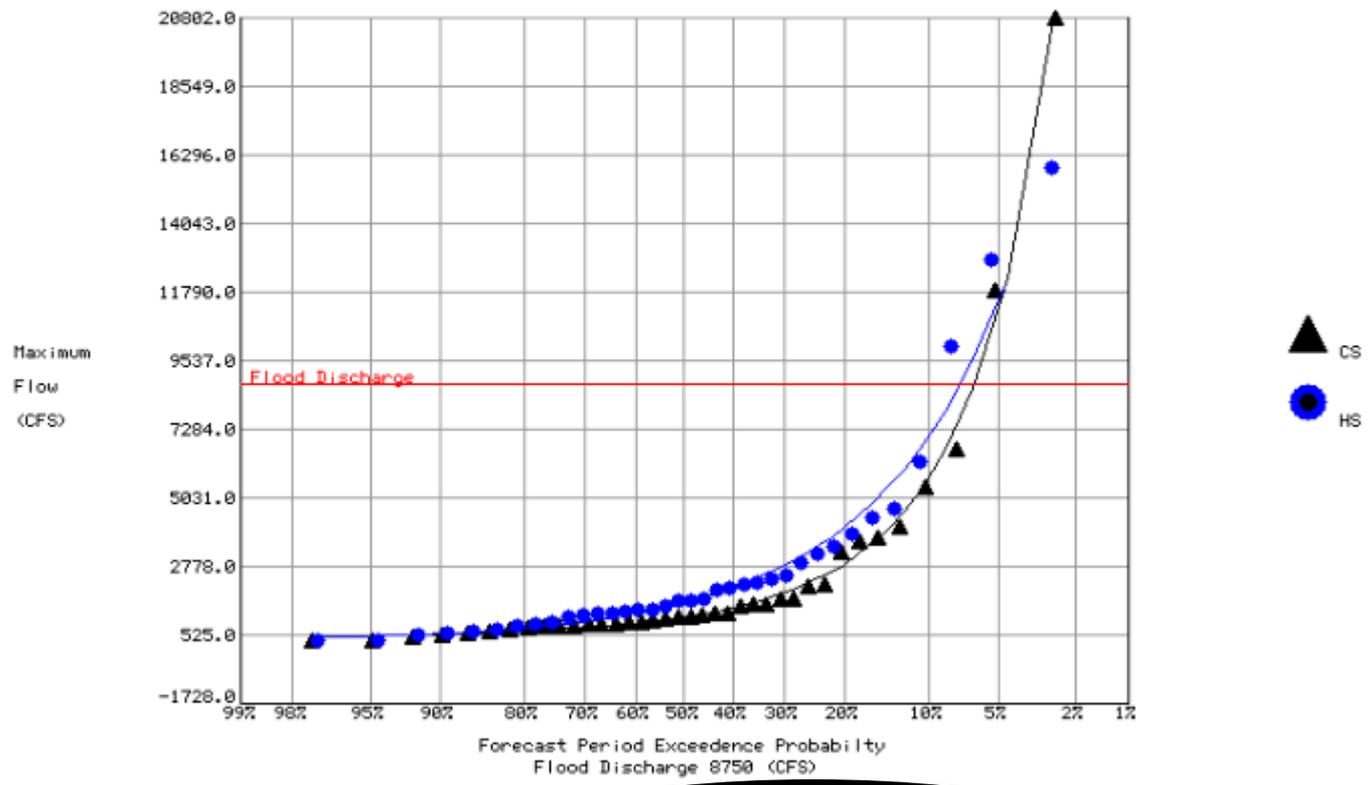
- Flow - Weekly Chance of Exceeding Levels
- Stage - Weekly Chance of Exceeding Levels
- Flow - Weekly Chance of Exceeding Levels**
- Volume - Weekly Chance of Exceeding Levels

This probabilistic forecast is issued by the California Nevada River Forecast Center.

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Carson R - Carson City
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About this graph

NOTE: Gauge reading may be affected by ice.

- Flow - Chance of Exceeding Levels Entire Period
- Stage - Chance of Exceeding Levels Entire Period
- Flow - Chance of Exceeding Levels Entire Period

[Return to Area Map](#)

Forecasts for the Carson River near Carson City are issued routinely year-round.

- Local weather forecast by "City, ST"
 - City, ST
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 - Satellite
 - Climate
 - Observed Precip
- Local Conditions
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National Weather Service California Nevada River Forecast Center

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- River/Reservoir Data
- River Guidance
- Flash Flood Guidance
- AHPS/ESP Traces
- WFO Hydro Products
- Water Supply
- River Flood Outlook
- Google™ Maps Data
- Weather**
- Quick Summary
- CNRFC/HPC QPF
- Watches/Warnings
- Satellite Imagery
- Radar Imagery
- Observations
- Weather Forecasts
- Numerical Models
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- Data and Indices
- Climate Forecasts
- El Niño and MJO
- Teleconnections
- Hydroclimatology
- Local Info and Links
- Research & Outreach
- Storm Summaries
- Publications
- Newsletter
- Links**
- RFC Map
- WFO Map

NOAA / NWS News and Local Information

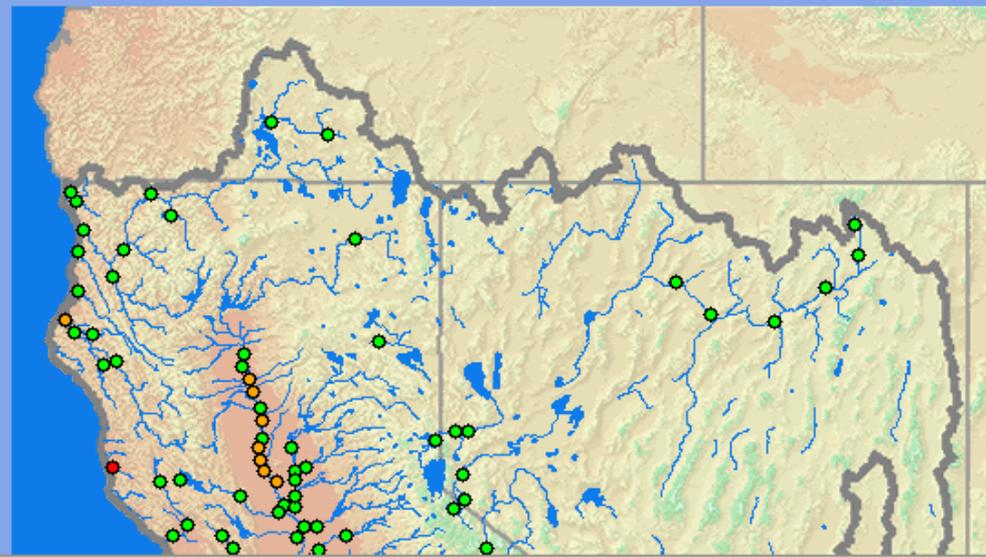
January 14, 2010 - January 2010 Mid-Month Water Supply Outlook Update- The January 2010 Mid-Month Water Supply Outlook Update is now available on our [Water Supply](#) webpage.

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Recent Text Products: Product Description Date/Time Issued to Web

Map Type: [Select](#) [Zoom](#) Current Zoom Factor: [1x](#) Help: [Learn More](#)

- [River Guidance \(Flood Forecast Points\)](#)
- [River Guidance \(Other Points\)](#)
- [AHPS/ESP Trace Analysis \(Create Your Own Product\)](#)



- River Guidance Forecast Status (Approx 5 Days)**
- No Data or No MS / FS
 - Normal Conditions
 - Above Monitor Stage
 - Above Flood Stage
 - Above Danger Stage
 - Gage Location

Graphical RVF Search

[Search](#)

Gage Information

Done



- ENTER LOCATION
- 90
- [Search Help](#)
- Hydrology
- Precipitation Data
- River/Reservoir
- Data
- River Guidance
- Flash Flood
- Guidance
- AHPS/ESP Traces
- WFO Hydro
- Products
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- Flash Flooding
- Water Supply
- Spring Snowmelt
- Acronyms
- NWS Glossary
- Contact Us
- Webmaster Email

CARSON RIVER - CARSON CITY (STWN2)

Latitude: 39.11° N Longitude: 119.71° W Elevation: 4620 Feet
 Location: Carson City County in Nevada

Issuance Time: Jan 20 2010 at 2:34 PM PST Next Issuance: Jan 21 2010 at 9:00 AM PST

Monitor Stage: 8.0 Feet

Flood Stage: 10.0 Feet



Observed - Forecast - Guidance - California Department of Water Resources
 Generated 01/20/2010 at 02:34 PM PST NWS7 California Nevada River Forecast Center

Verification - Historical Graphical RVF

Month: Day: Year: Cycle:

To view other verification locations, use our [Historical Graphical River Forecast Interface](#).

Historical Info	Peak Discharge	Stage	Date
-----------------	----------------	-------	------



- Get Local Forecast for:
- Enter location:
- [Search Help](#)
- Hydrology
 - [Precipitation Data](#)
 - [River/Reservoir](#)
- Data
 - [River Guidance](#)
 - [Flash Flood](#)
- Guidance
 - [AHP/ESP Traces](#)
 - [WFO Hydro](#)
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CARSON RIVER - CARSON CITY (STWN2)

Latitude: 39.11° N Longitude: 119.71° W Elevation: 4620 Feet

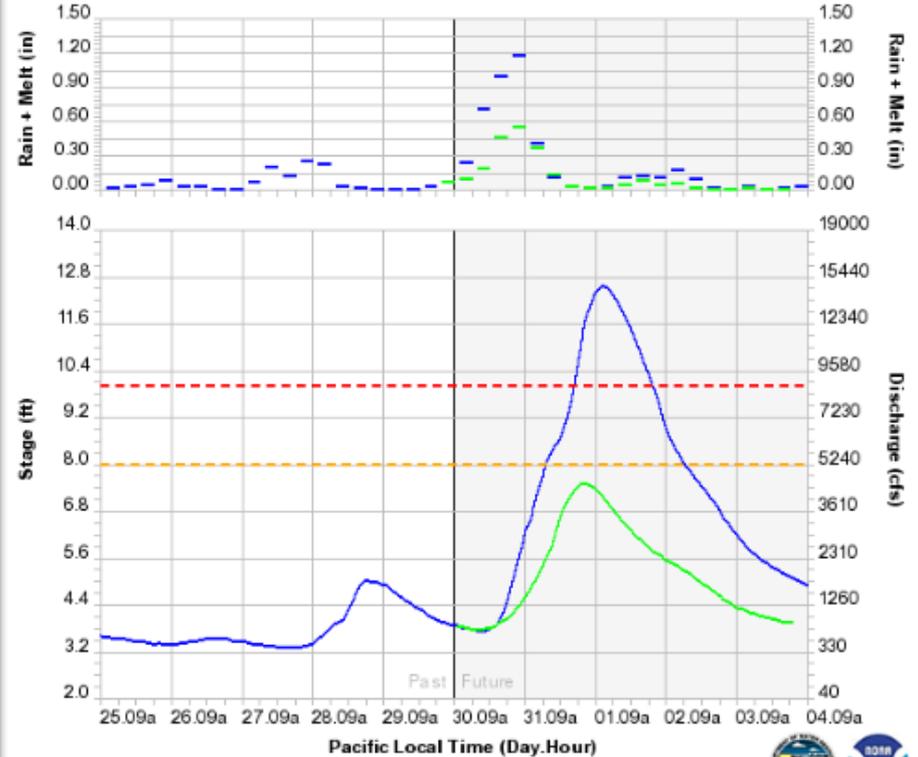
Location: Carson City County in Nevada

Forecast — Observed —

Previous Forecast	Next Forecast
Friday 12/30/2005 00-06 UTC	Friday 12/30/2005 18-00 UTC
Selected Date: Friday 12/30/2005 12-18 UTC	

STWN2 - CARSON - CARSON CITY, NR (MS: 8.0 / FS: 10.0)

Forecast Issuance: December 30, 2005 at 09:54 AM PST



Observed — Forecast — Monitor — Flood —
 Generated 07/18/2008 at 10:33 AM PDT
 California Department of Water Resources
 NWS / California Nevada River Forecast Center

Verification - Historical Graphical RVF

Month: Day: Year: Cycle:

To view other verification locations, use our [Historical Graphical River Forecast Interface](#)



National Weather Service California Nevada River Forecast Center

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Get Local Forecast for:

Enter location...

[Search Help](#)

- Hydrology
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- Flash Flood
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Recent Text Products:

Product Description	Date/Time Issued to Web

Map Type: Current Zoom Factor: Help:

-



- River Guidance Forecast Status (Approx 5 Days)
- No Data or No MS / FS
 - Normal Conditions
 - Above Monitor Stage
 - Above Flood Stage
 - Above Danger Stage
 - Gage Location

Graphical RVF Search

Gage Information

Place cursor over gage on map for readout.

River / Creek

Gage / Station

Done



National Weather Service California Nevada River Forecast Center

Get Local Forecast for:

Enter location... [GO]

- [Search Help](#)
- Hydrology**
- [Precipitation Data](#)
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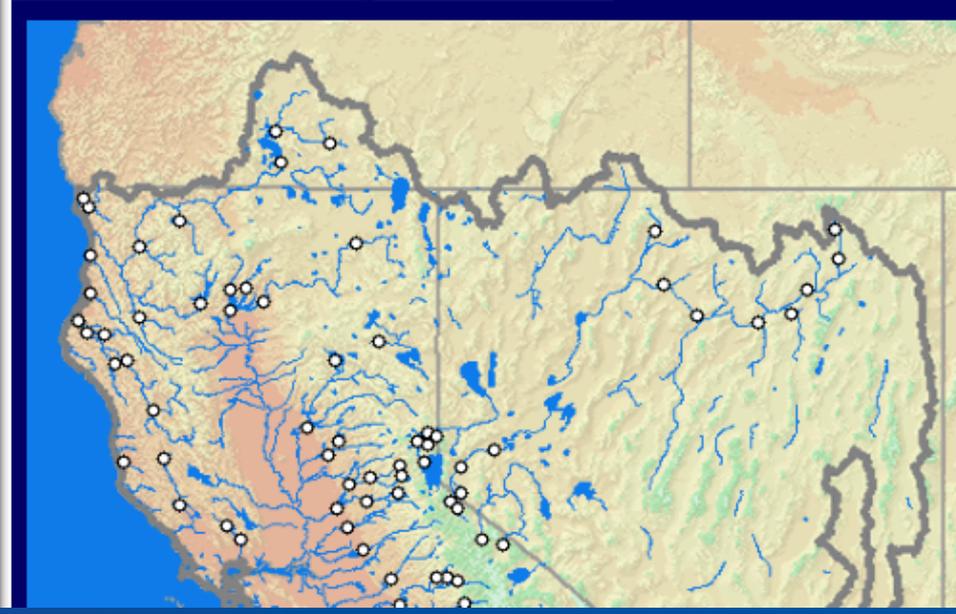
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Recent Text Products:

Product Description	Date/Time Issued to Web

Map Type: **Select** **Zoom** Current Zoom Factor: **1x** Help: **Learn More**

[River Guidance \(Flood Forecast Points\)](#)
[River Guidance \(Other Points\)](#)
[AHPS/ESP Trace Analysis \(Create Your Own Product\)](#)



AHPS/ESP Trace Analysis Status (Approx 1 Year)

- Available ESP Traces
- Normal Conditions
- Above Monitor Stage
- Above Flood Stage
- Above Danger Stage
- Gage Location

Graphical RVF Search

[]

Search

Gage Information

Place cursor over gage on map for readout.



Water Data for ... CNRFC - AHPS - AHPS / ESP ... CNRFC - Hydrology - AHPS - AHP...

Home News Organization Frequently Asked Questions Search

AHPS / ESP Trace Analysis

1 Select a Location:

CARSON RIVER - CARSON CITY (STWN2) ▼

<p>2 Select an Accumulation Type:</p> <p style="text-align: center;"> <input checked="" type="radio"/> Mean <input type="radio"/> Minimum <input type="radio"/> Maximum <input type="radio"/> Summation </p>	<p>3 Select an Interval:</p> <p style="text-align: center;"> <input checked="" type="radio"/> Day <input type="radio"/> Week <input type="radio"/> Month <input type="radio"/> Entire Period </p>
--	---

4 Select a Starting Date: Month: Jan ▼ Day: 20 ▼ Year: 2010 ▼

5 Select an Ending Date: Month: Jul ▼ Day: 20 ▼ Year: 2010 ▼

6a Select a Plot Option and Generate:

Traces Probability Expected Value Exceedance

Generate a Plot

6b Select a Table Option and Generate:

Forecast Info Quantiles Flood Quantiles

Generate a Table

Help Making Selections and Interpreting Results *(Click Help Button)*



National Weather Service California Nevada River Forecast Center

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CARSON RIVER - CARSON CITY (STWN2)

Latitude: 39.11° N Longitude: 119.71° W Elevation: 4620 Feet

Location: Carson City County in Nevada

Monitor Stage: 8.0 Feet

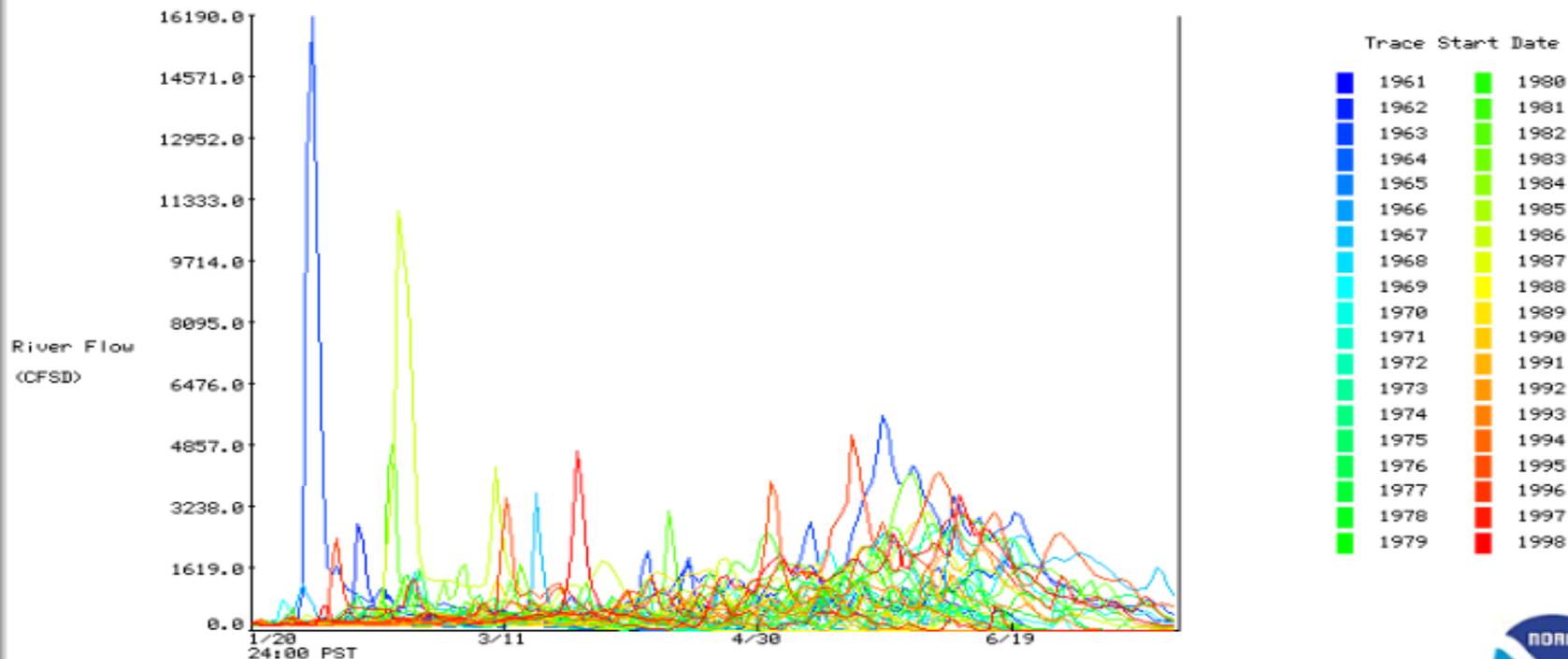
Flood Stage: 10.0 Feet

ESP Trace Ensemble

CARSON RIVER - CARSON CITY (STWN2) - ESP Trace Ensembles

Latitude: 39.1 Longitude: 119.7
Forecast for the period 1/20/2010 24h - 7/20/2010 24h

This is a conditional simulation based on the current conditions of 1/19/2010



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River Forecast Center

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CARSON RIVER - CARSON CITY (STWN2)

Latitude: 39.11° N Longitude: 119.71° W Elevation: 4620 Feet

Location: Carson City County in Nevada

Monitor Stage: 8.0 Feet

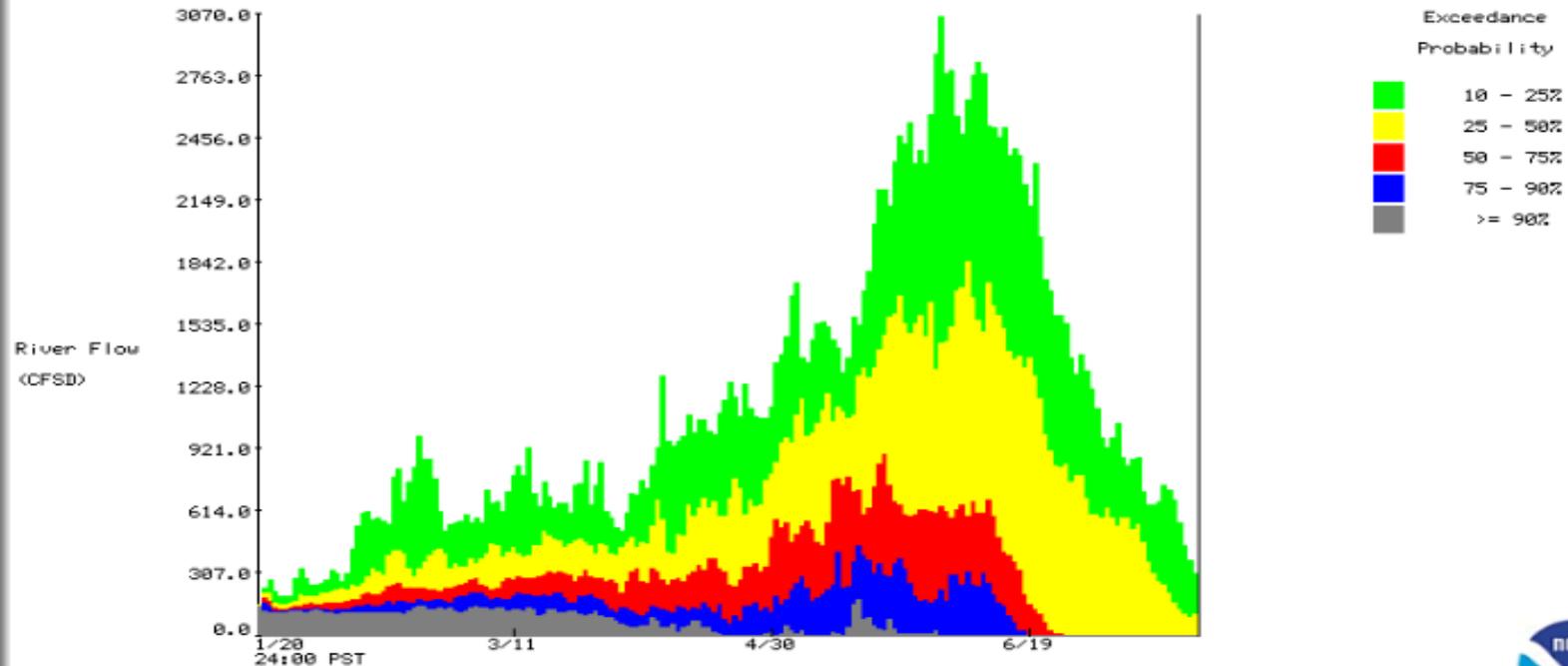
Flood Stage: 10.0 Feet

1 Day Chances of Exceeding River Levels

CARSON RIVER - CARSON CITY (STWN2) - 1 Day Chances of Exceeding River Levels

Forecast for the period 1/20/2010 24h - 7/28/2010 24h

This is a conditional simulation based on the current conditions as of 1/19/2010





National Weather Service California Nevada River Forecast Center

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CARSON RIVER - CARSON CITY (STWN2)
Latitude: 39.11° N Longitude: 119.71° W Elevation: 4620 Feet
Location: Carson City County in Nevada
Monitor Stage: 8.0 Feet *Flood Stage: 10.0 Feet*

ESP Expected Value

CARSON RIVER - CARSON CITY (STWN2) - ESP Expected Value
Lat: 39.11° N Long: 119.71° W
Forecast for the period 1/20/2010 24h - 7/20/2010 24h

