WaterWatch Data Services Information Page

The purpose of WaterWatch data services is to provide application consumable WaterWatch data through a RESTful like service. WaterWatch provides a variety of services related to streamflow conditions as computed at USGS streamgages.

Web Service Descriptions

The following web services are described below:

- Real-time streamflow
- Current flood and highflow
- Average streamflow for 7, 14, and 28 day periods
- Flow change
- Flood stage

1. Current Conditions Real-Time Streamflow Service

The real-time streamflow service provides data that tracks short-term changes (over several hours) in rivers and streams.

Service Name

The service name is '**realtime**' and follows the base URL for data services. The service URL is located at https://waterwatch.usgs.gov/webservices/realtime?

URL Format

http://waterwatch.usgs.gov/webservices/realtime?<parameter>

Service Examples

Get real-time data that summarizes current streamflow conditions by a region returned in JSON format.

```
https://waterwatch.usgs.gov/webservices/realtime?region=ks&format=json
```

Get real-time data that summarizes current streamflow conditions by site returned in JSON format.

```
https://waterwatch.usgs.gov/webservices/realtime?site=07144100&format=json
```

Get real-time current conditions data by HUC region in XML format

```
https://waterwatch.usgs.gov/webservices/realtime?region=10&format=xml
```

Parameter conventions

The service parameters are region, site, and format. The first parameter is preceded using a '?'. Additional query parameters are separated using an '&'. The parameters region and site are mutually exclusive. If both are specified the region parameter takes precendence. Arguments to the parameters are described below.

region=[st | huc_02]

where 'st' is 2 character state abbreviation, e.g. "region=ks"

or

where 'huc_02' is a 2 digit HUC region number, e.g. "region=02". Valid HUC regions are 01 through 21.

site=[site_no]
&format=[json | xml | csv]

where the parameter can get set either to 'json', 'xml', or 'csv', e.g. "format=json"

Major Filters

The service provides for filters in order to reduce the number of results returned.

Major Filter	Meaning	Examples
region	A region can be either a 2 character state code or a 2 digit HUC region number. Valid HUC regions are 01 through 21.	&region=ks &region=02
site	A USGS site number. If you don't know the site number you need, you can find it on the "WaterWatch interactive site selector"	&site=07144100 &site=06892350

Output Format

The realtime service returns output in either JSON or XML format using the &format parameter.

&format=[json | xml | csv]

where the parameter can get set either to ‘json’, ‘xml’, or 'csv', e.g. “&format=json”

Output Description

Formatted output is returned for each site that meets the filter criteria. Each site grouping contains the following elements:

Element Name	Description	Examples
site_no	Each site in the USGS data base has a unique 8- to 15-digit identification number. Site numbers are assigned based on this logic. You can search using an exact match or match using a partial site number. To use an exact match you must include all of the digits including any leading zeros (0) that make up the complete site number. A site will not be found if the site number has a leading zero and it is not included in the string tested using an exact match.	**07144100**
station_nm	This is the official name of the site in the database.	**L ARKANSAS R NR SEDGWICK, KS**
dec_lat_va	Decimal latitude.	**37.8831**
dec_long_va	Decimal longitude.	**-97.4245**
huc_cd	In the United States, watersheds have been numbered since the 1970's using an 8-digit system known as a "Hydrologic Unit Code" (HUC).	**11030012**
flow	Is the volume of water flowing past a given point in the stream in a given period of time. For periods where flow is replaced by a status code see the following reference for additional information on status codes.	**114**
flow_unit	A rate of the flow, in streams and rivers, for example. It is equal to a volume of water one foot high and one foot wide flowing a distance of one foot in one second. One "cfs" is equal to 7.48 gallons of water flowing each second.	**cfs**
flow_dt	Is the measurement date and local standard time of the flow element.	**2016-01-20 08:15:00**
stage	Is the height of the water in the	**3.37**

	stream above a reference point (also known as gage height). Gage height refers to the elevation of the water surface in the specific pool at the streamgaging station, not along the entire stream. Gage height also does not refer to the depth of the stream. Measurements of gage height are continually recorded by equipment inside a gagehouse on the streambank. For periods where stage is replaced by a status code see the following reference for additional information on status codes.	
stage_unit	Is the unit used in the measurement of the stage element.	**ft**
stage_dt	Is the measurement date and local standard time of the stage element.	**2016-01-20 08:15:00**
class	Streamflow condition classification. 0 - Not valid (internal use) 1 - New minimum 2 - ge old minimum and le 5th percentile 3 - gt 5th percentile and le 10th percentile 4 - gt 10th percentile and le 25th percentile 5 - gt 25th percentile and le 75th percentile 6 - gt 75th percentile and le 90th percentile 7 - gt 90th percentile and le old maximum 8 - New maximum Additional details regarding the class value can be found in the metadata describing "Realtime USGS Streamflow Stations."	**0**
percentile	A percentile is a value on a scale of one hundred that indicates the percent of a distribution that is equal to or below it.	**86.42**
percent_median	percent_median = flow/long_term_median * 100	**240**
percent_mean	percent_mean = flow/long_term_mean * 100	**194.74**
url	A URL link to the National Water Information System Web Interface for current conditions for the site.	**`https://waterdata.usgs.gov/ks/nwis/uv?site_no=07144100`**

2. Flood and High Flow Service

The flood service returns data of streamgages where the water level is currently at or above flood stage or at high flow. The high flow conditions are expressed as percentiles that compare the current (i.e., within the past several hours) instantaneous flow value to the historical daily mean flow values for all days of the year.

Service Name

The service name is **'flood**' and follows the base URL for data services. The service URL is located at http://waterwatch.usgs.gov/webservices/flood?

URL Format

https://waterwatch.usgs.gov/webservices/flood?<parameters>

Service Examples

Get the latest data for Kansas that summarizes the flood and high flow for all sites returned in JSON format.

```
https://waterwatch.usgs.gov/webservices/flood?region=ks&format=json
```

Get the latest data for HUC region '10' that summarizes the flood and high flow for all sites returned in JSON format.

```
https://waterwatch.usgs.gov/webservices/flood?region=10&format=json
```

Get flood and high flow data by state abbreviation (i.e. ks) for streamgages at or above flood stage and return in XML format.

```
https://waterwatch.usgs.gov/webservices/flood?region=ks&floodonly&format=xml
```

Service Parameters

The service parameters are region, site, floodonly, and format. The first parameter is preceded using a '?'. Additional query parameters are separated using an '&'. The parameters region and site are mutually exclusive. If both are specified the region parameter takes precendence. Arguments to the parameters are described below.

parameter list

region=[st | huc_02]

where 'st' is a 2 character state abbreviation, e.g. "region=ks"

or

where 'huc_02' is a 2 digit HUC region number, e.g. "region=02". Valid HUC regions are 01 through 21.

site=[site_no]
&floodonly
&format=[json | xml | csv]

where the parameter can get set either to 'json', 'xml', or 'csv', e.g. "format=json"

Note: the floodonly parameter does not require an argument and indicates to the service to only return data for streamgages that are at or above flood stage established by the National Weather Service, e.g. "floodonly"

Output Description

Formatted output is returned for each site that meets the filter criteria. Each site grouping contains the following elements:

Element Name	Description	Examples
site_no	Each site in the USGS data base has a unique 8- to 15-digit identification number. Site numbers are assigned based on this logic. You can search using an exact match or match using a partial site number. To use an exact match you must include all	**07144100**

	of the digits including any leading zeros (0) that make up the complete site number. A site will not be found if the site number has a leading zero and it is not included in the string tested using an exact match.	
station_nm	This is the official name of the site in the database.	**L ARKANSAS R NR SEDGWICK, KS**
dec_lat_va	Latitude in decimal degrees of USGS streamgage.	**37.8831**
dec_long_va	Longitude in decimal degrees of USGS streamgage.	**-97.4245**
huc_cd	In the United States, watersheds have been numbered since the 1970's using an 8-digit system known as a "Hydrologic Unit Code" (HUC).	**11030012**
flow	Is the volume of water flowing past a given point in the stream in a given period of time. For periods where flow is replaced by a status code see the following reference for additional information on status codes.	**114**
flow_unit	A rate of the flow, in streams and rivers, for example. It is equal to a volume of water one foot high and one foot wide flowing a distance of one foot in one second. One "cfs" is equal to 7.48 gallons of water flowing each second.	**cfs**
flow_dt	Is the measurement date and local standard time of the flow element.	**2016-01-20 08:15:00**
stage	Is the height of the water in the stream above a reference point (also known as gage height). Gage height refers to the elevation of the water surface in the specific pool at the streamgaging station, not along the entire stream. Gage height also does not refer to the depth of the stream. Measurements of gage height are continually recorded by equipment inside a gagehouse on the streambank. For periods where stage is replaced by a status code see the following reference for additional information on status codes.	**3.37**
stage_unit	Is the unit used in the measurement of the stage element.	**ft**
stage_dt	Is the measurement date and local standard time of the stage element.	**2016-01-20 08:15:00**
class	Streamflow condition classification. 0 - unranked because the site has no NWS flood stage. 1 - streamflow is less than the 95th percentile for all days and there is no NWS flood stage for this sip.	**0**

	2 - streamflow is between the 95th and 98th percentiles for all days and there is no NWS flood stage for this site. 3 - streamflow is greater than or equal to the 99th percentile for all days and there is no NWS flood stage for this site. 4 - streamflow is above flood stage. 5 - streamflow is less than the 95th percentile for all days and there is a NWS flood stage for this site. 6 - streamflow is between the 95th and 98th percentiles for all days and there is a NWS flood stage for this site. 7 - streamflow is greater than or equal to the 99th percentile for all days and there is a NWS flood stage for this site. 8 - unranked for a site even though it has a NWS flood stage.	
percentile	The percentage of all historical daily streamflow values that are less than the current streamflow value.	**86.42**
percent_median	The quotient of the streamflow value and the median of all historical streamflows expressed as a percentage.	**240**
percent_mean	The quotient of streamflow value and mean of all historical streamflows expressed as a percentage.	**194.74**
url	A URL link to the National Water Information System Web Interface for current conditions for the site.	**http://waterdata.usgs.gov/ks/nwis/uv?site_no=07144100**

3. ## Average Streamflow for 7, 14, and 28 Days Service

The "n-day average streamflow" service returns the average streamflow conditions for the past n-days. By averaging over an entire period, the values are more indicative of longer-term streamflow conditions.

The service provides n-day average streamflow conditions as computed at USGS streamgages. The percentile value returned represents n-day average streamflow compared to **percentiles** of historical n-day average streamflow for the day of the year. This service represents conditions adjusted for this time of the year. Only streamgages having at least 30 years of record are used.

Service Name

The service name is '**flowsnd**' and follows the base URL for data services. The service URL is located at http://waterwatch.usgs.gov/webservices/flowsnd?

where 'n' is 7, 14, or 28, respectively.

URL Format

https://waterwatch.usgs.gov/webservices/flowsnd?<parameter>

Service Examples

Get 7 day average streamflow by state returned in JSON format.

```
https://waterwatch.usgs.gov/webservices/flows7d?region=ks&format=json
```

Get 14 day average streamflow by site returned in JSON format.

```
https://waterwatch.usgs.gov/webservices/flow14d?site=07144100&format=json
```

Get 28 day average streamflow by HUC region in XML format

```
https://waterwatch.usgs.gov/webservices/flows28d?region=10&format=xml
```

Parameter conventions

The service parameters are region, site, and format. The first parameter is preceded using a '?'. Additional query parameters are separated using an '&'. The parameters region and site are mutually exclusive. If both are specified the region parameter takes precendence. Arguments to the parameters are described below.

region=[st | huc_02]

where ‘st’ is 2 character state abbreviation, e.g. “region=ks”

or

where ‘huc_02’ is a 2 digit HUC region number, e.g. “region=02”. Valid HUC regions are 01 through 21.

site=[site_no]
format=[json | xml | csv]

where the parameter can get set either to ‘json’, ‘xml’, or 'csv', e.g. “format=json”

Major Filters

The service provides for filters in order to reduce the number of results returned.

Major Filter	Meaning	Examples
region	A region can be either a 2 character state code or a 2 digit HUC region number. Valid HUC regions are 01 through 21.	&region=ks &region=02
site	A USGS site number. If you don't know the site number you need, you can find it on the "WaterWatch interactive site selector"	&site=07144100 &site=06892350

Output Format

The realtime service returns output in either JSON or XML format using the &format parameter.

&format=[json | xml | csv]

where the parameter can get set either to ‘json’, ‘xml’, or 'csv', e.g. “&format=json”

Output Description

Formatted output is returned for each site that meets the filter criteria. Each site grouping contains the following elements:

Element Name	Description	Examples
site_no	Each site in the USGS data base has a unique 8- to 15-digit identification number. Site numbers are assigned based on this logic. You can search using an exact match or match using a partial site number. To use an exact match you must include all of the digits including any leading zeros (0) that make up the complete site number. A site will not be found if the site number has a leading zero and it is not included in the string tested using an exact match.	**07144100**
station_nm	This is the official name of the site in the database.	**L ARKANSAS**

		R NR SEDGWICK, KS
dec_lat_va	Decimal latitude.	**37.8831**
dec_long_va	Decimal longitude.	**-97.4245**
huc_cd	In the United States, watersheds have been numbered since the 1970's using an 8-digit system known as a "Hydrologic Unit Code" (HUC).	**11030012**
flow	Is the volume of water flowing past a given point in the stream in a given period of time. For periods where flow is replaced by a status code see the following reference for additional information on status codes.	**114**
flow_unit	A rate of the flow, in streams and rivers, for example. It is equal to a volume of water one foot high and one foot wide flowing a distance of one foot in one second. One "cfs" is equal to 7.48 gallons of water flowing each second.	**cfs**
flow_dt	Is the measurement date and local standard time of the flow element.	**2016-01-20 08:15:00**
class	Streamflow condition classification. 0 - Not valid (internal use) 1 - New minimum 2 - ge old minimum and le 5th percentile 3 - gt 5th percentile and le 10th percentile 4 - gt 10th percentile and le 25th percentile 5 - gt 25th percentile and le 75th percentile 6 - gt 75th percentile and le 90th percentile 7 - gt 90th percentile and le old maximum 8 - New maximum Additional details regarding the class value can be found in the metadata describing "Realtime USGS Streamflow Stations."	**0**
percentile	A percentile is a value on a scale of one hundred that indicates the percent of a distribution that is equal to or below it.	**86.42**
percent_median	percent_median = flow/long_term_median * 100	**240**
percent_mean	percent_mean = flow/long_term_mean * 100	**194.74**

4. Hourly Flow Change Service

Display hourly flow change Highligh sites with increasing

Service Name

The service name is '**flowchange**' and follows the base URL for data services. The service URL is located at http://waterwatch.usgs.gov/webservices/flowchange?

URL Format

https://waterwatch.usgs.gov/webservices/flowchange?<parameter>

Service Examples

Get the hourly flow change for sites in KS in JSON format.

```
https://waterwatch.usgs.gov/webservices/flowchange?region=ks&format=json
```

```
Get the hourly flow change by HUC region in XML format

https://waterwatch.usgs.gov/webservices/flowchange?region=02&format=xml
```

Parameter conventions

The service parameters are region, site, and format. The first parameter is preceded using a '?'. Additional query parameters are separated using an '&'. The parameters region and site are mutually exclusive. If both are specified the region parameter takes precendence. Arguments to the parameters are described below.

&region=[st | huc_02]

where ‘st’ is 2 character state abbreviation, e.g. “region=ks”

or

where ‘huc_02’ is a 2 digit HUC region number, e.g. “region=02”. Valid HUC regions are 01 through 21.

site=[site_no]
format=[json | xml | csv]

where the parameter can get set either to ‘json’, ‘xml’, or 'csv', e.g. “format=json”

Major Filters

The service provides for filters in order to reduce the number of results returned.

Major Filter	Meaning	Examples
region	A region can be either a 2 character state code or a 2 digit HUC region number. Valid HUC regions are 01 through 21.	&region=ks &region=02
site	A USGS site number. If you don't know the site number you need, you can find it on the "WaterWatch interactive site selector"	&site=07144100 &site=06892350

Output Format

The realtime service returns output in either JSON or XML format using the &format parameter.

&format=[json | xml | csv]

where the parameter can get set either to ‘json’, ‘xml’, or 'csv', e.g. “&format=json”

Output Description

Formatted output is returned for each site that meets the filter criteria. Each site grouping contains the following elements:

Element Name	Description	Examples
site_no	Each site in the USGS data base has a unique 8- to 15-digit identification number. Site numbers are assigned based on this logic. You can search using an exact match or match using a partial site number. To use an exact match you must include all of the digits including any leading zeros (0) that make up the complete site number. A site will not be found if the site number has a leading zero and it is not included in the string tested using an exact match.	**07144100**
station_nm	This is the official name of the site in the database.	**L ARKANSAS R NR SEDGWICK, KS**
dec_lat_va	Decimal latitude.	**37.8831**
dec_long_va	Decimal longitude.	**-97.4245**
huc_cd	In the United States, watersheds have been numbered since the 1970's using an 8-digit system known as a "Hydrologic Unit Code" (HUC).	**11030012**
flow	Is the volume of water flowing past a given point in the stream in a given period of	**114**

	time. For periods where flow is replaced by a status code see the following reference for additional information on status codes.	
flow_unit	A rate of the flow, in streams and rivers, for example. It is equal to a volume of water one foot high and one foot wide flowing a distance of one foot in one second. One "cfs" is equal to 7.48 gallons of water flowing each second.	**cfs**
flow_dt	Is the measurement date and local standard time of the flow element.	**2016-01-20 08:15:00**
stage	Is the height of the water in the stream above a reference point (also known as gage height). Gage height refers to the elevation of the water surface in the specific pool at the streamgaging station, not along the entire stream. Gage height also does not refer to the depth of the stream. Measurements of gage height are continually recorded by equipment inside a gagehouse on the streambank. For periods where stage is replaced by a status code see the following reference for additional information on status codes.	**3.37**
stage_unit	Is the unit used in the measurement of the stage element.	**ft**
stage_dt	Is the measurement date and local standard time of the stage element.	**2016-01-20 08:15:00**
flow_chg	Flow change per hour.	**0.17**
flow_chg_percent	Hourly flow change in percentage.	**10.49**
stage_chg	Stage change per hour.	**0.01**
stage_chg_percent	Hourly stage change in percentage.	**5**

5. ## Flood Stage Service

Retrieve for levels for NWS flood stages including action, flood, moderate flood, and major flood.

Service Name

The service name is '**floodstage**' and follows the base URL for data services. The service URL is located at http://waterwatch.usgs.gov/webservices/floodstage?

URL Format

https://waterwatch.usgs.gov/webservices/floodstage?<parameter>

Service Examples

Get the flood stage for a specific site in JSON format.

```
https://waterwatch.usgs.gov/webservices/floodstage?site=07144100&format=json
```

Parameter conventions

The service parameters are site and format. The first parameter is preceded using a '?'. Additional query parameters are separated using an '&'. The parameters region and site are mutually exclusive. If both are specified the region parameter takes precendence. Arguments to the parameters are described below.

site=[site_no]

where 'site_no' is a USGS site number.

&format=[json | xml | csv]

where the format parameter is 'json', 'xml', or 'csv', e.g. "format=json"

Major Filters

The service provides for filters in order to reduce the number of results returned.

Major	Meaning	Examples

Filter		
site	A USGS site number. If you don't know the site number you need, you can find it on the "WaterWatch interactive site selector"	&site=07144100 &site=06892350

Output Format

The realtime service returns output in either JSON or XML format using the &format parameter.

&format=[json | xml | csv]

where the parameter can get set either to ‘json’, ‘xml’, or 'csv', e.g. “&format=json”

Output Description

Formatted output is returned for each site that meets the filter criteria. Each site grouping contains the following elements:

Element Name	Description	Examples
site_no	Each site in the USGS data base has a unique 8- to 15-digit identification number. Site numbers are assigned based on this logic. You can search using an exact match or match using a partial site number. To use an exact match you must include all of the digits including any leading zeros (0) that make up the complete site number. A site will not be found if the site number has a leading zero and it is not included in the string tested using an exact match.	**07144100**
action_stage	The stage which, when reached by a rising stream, represents the level where the NWS or a partner/user needs to take some type of mitigation action in preparation for possible significant hydrologic activity. The appropriate action is usually defined in a weather forecast office (WFO) hydrologic services manual.	**20**
flood_stage	An established gage height for a given location above which a rise in water surface level begins to create a hazard to lives, property, or commerce. The issuance of flood (or in some cases flash flood) warnings is linked to flood stage. Not necessarily the same as bankfull stage.	**22**
moderate_flood_stage	The stage which, when reached by a rising stream, represents the level where some inundation of structures and roads exists near streams. Some evacuations of people and/or transfer of property to higher elevations.	**25**
major_flood_stage	Extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations.	**26**