

NWS FORM E-19 (COVER)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE

REPORT ON RIVER GAGE STATION

REVISED, PRINTED DATES: 08/24/2012, 08/24/2012

LOCATION: Markleeville
STREAM: East Fork Carson River
BASIN: Carson River HSA: REV

REFERENCES:

CA DWR Carson River Atlas, 12/1991
Correspondence w/Douglas Co. Office of Emergency Management
Correspondence w/Douglas Co. Public Works
Correspondence w/Douglas Co. Sheriff Office
Discussion w/Carson Water Subconservancy District
FEMA National FIRMs, Carson River Watershed, DRAFT, 8/16/2012
NV Division of Conservation & Natural Resources: The Flood of 1997; 5/1997
NV Division of Conservation & Natural Resources; Carson R. Chronology; 4/1997
NWS Report on E Fk Carson R nr Gardnerville, 9/2011
USCE Jan 97 Flood Assessment; E Sierra/W NV Basins; 9/1997
USDA SCS; NV DC&NR; CA RA: Flood Chronology; Carson River Basin 1861-1976: 9/1977
USDA SCS; NV DC&NR; CA RA: Water & Related Land Resources; Central Lahontan Basin: 7/1975
USDA SCS; NV DC&NR: History of Flooding, Carson Valley Watershed, 12/1852-6/1969; 11/1973
USGS Carters Station NV-CA 1:24,000 Scale Map
USGS Fact Sheet FS183-97, Flood of Jan 97 in Carson River Basin; 12/1997
USGS Flood Frequency Analysis, WY 1961-2011; 7/24/2012
USGS Gaging Station Description, 5/10/2012
USGS Gardnerville NV 1:24,000 Scale Map
USGS Markleeville CA 1:24000 Scale Map
USGS Minden NV 1:24,000 Scale Map
USGS Peak Flow Data, WY 1961-2012
USGS Smith Valley NV-CA 1:100,000 Scale Map; 1985
USGS Water Resources Data, WY 1961-2012

ABBREVIATIONS:

BM - bench mark	EPA - Environmental Protection Agency
DS - downstream	IBWC - International Boundary and Water Comm.
US - upstream	MSRC - Mississippi River Commission
HW - high water	MORC - Missouri River Commission
LW - low water	NOAA - National Oceanic and Atmospheric Admin.
RB - right bank	NOS - National Ocean Survey
LB - left bank	NWS - National Weather Service
MGL - mean gulf level	TVA - Tennessee Valley Authority
MLW - mean low water	USACE - U.S. Army Corps of Engineers
MSL - mean sea level	USBR - U.S. Bureau of Reclamation
MLT - mean low tide	USGS - U.S. Geological Survey
MT - mean tide	USWB - U.S. Weather Bureau
WQ - water quality	NGVD - National Geodetic Vertical Datum
RM - reference mark	NAD - North American Datum
RP - reference point	

LOCATION IDENTIFICATION: CEMC1
NWS INDEX NUMBER:
USGS NUMBER: 10308200

BENCHMARKS

ELEVATION OF GAGE ZERO: 5400.000 VERTICAL DATUM: NGVD29
 LEVELING AGENCY AND DATE: Level CHECKBAR: 0.000
 RATING AGENCY: USGS

BENCHMARK	DESCRIPTION	GAGE ZERO	DATUM

CSG	Crest stage gage pin, anchored into rock bank just upstream of stilling well. Levels of 9/29/2011.	6.312	5406.312
RM1	Brass disk in concrete anchor block on RB of USGS cableway. Levels of 10/7/1968.	21.172	5421.172
RM2	One-half inch bolt painted yellow in a concrete block anchored in the rock bank 15 ft. above old gage. Levels of 9/29/2011.	4.974	5404.974
RM3	Rebar set in 4-inch PVC pipe with concrete 35 feet shoreward from end of stilling well walkway. Levels of 9/29/2011.	25.036	5425.036
RM5	USGS brass disk in NE corner of gage house foundation. Levels of 9/29/2011.	23.638	5423.638
RP1	Outside staff lag bolt, in 2"x6" plank attached to old stilling well. Levels of 9/29/2011.	3.878	5403.878

GAGES

DCP

TELEM

NESS ID: DD0C20C0
 OWNER: USGS
 REPORT TIME: 00:13:20
 INTERVAL: 60

TYPE OF TELEMETRY:
 OWNER:
 PHONE NUMBER:
 INTERVAL:
 PAYOR/COST OF LINE: / \$

GAGE TYPE	OWNER	MAINTENANCE	BEGAN	ENDED	GAGE LOCATION/REMARKS
CREST STG GAGE	USGS	USGS	08/17/1960		Anchored into rock bank just upstream of old still well; on RB, 0.5 mi DS of Markleeville Ck.
FLOAT	USGS	USGS	08/17/1960	09/01/1990	In stilling well on RB, 0.5 mi DS of Markleeville Ck. Drove recorder.
RECORDER	USGS	USGS	08/17/1960	09/01/1990	In well house, driven by float tape (CR10 driven by shaft encoder). Types: Stevens A35 (1960s), Fischer Porter ADR (1960s-1980s).
STAFF	USGS	USGS	08/17/1960		Enameled sections, 0.00 to 6.74 ft, on 2"x6" plank attached to stilling well; on RB, 0.5 mi DS of Markleeville Ck.
PRESSURE TRANSDUCER	USGS	USGS	09/01/1990	07/20/2001	PS2 Pressure Transducer (SDI12) integrated with Campbell Scientific BDR-320 recorder in steel gage shelter mounted on concrete slab on RB, 35' E of channel and 0.5 mi DS of Markleeville Ck.
RECORDER	USGS	USGS	09/01/1990	07/20/2001	PS2 Pressure Transducer (SDI12) integrated with Campbell Scientific BDR-320 recorder in steel gage shelter mounted on concrete slab on RB, 35' E of channel and 0.5 mi DS of Markleeville Ck.
DCP	USGS	USGS	07/20/2001		Sutron Satlink DCP interfaced with Sutron SL2-ENC datalogger and Accububble pressure transducer. On RB, in steel gage house, 35' E of channel, 0.5 mi. DS of Markleeville Ck.
PRESSURE TRANSDUCER	USGS	USGS	07/20/2001		Sutron Accububble interfaced w/Sutron Satlink DCP and SL2-ENC datalogger, in steel gage Shelter mounted on concrete slab on RB, 35' E of channel, 0.5 mi DS of Markleeville Ck.
RECORDER	USGS	USGS	07/20/2001		Sutron Datalogger Model SL2-ENC interfaced with Sutron Accububble pressure transducer and Satlink DCP. On RB, in steel gage shelter on concrete slab 35' E of channel, 0.5 mi. DS of Markleeville Ck.

HISTORY

PUBLICATION/LOCATION OF RECORDS -----	STARTING DATE -----	ENDING DATE -----
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TYPE OF GAGE -----	OWNER -----	STARTING DATE -----	ENDING DATE -----
CREST STAGE GAGE	USGS	08/17/1960	
FLOAT	USGS	08/17/1960	09/01/1990
RECORDER	USGS	08/17/1960	09/01/1990
STAFF	USGS	08/17/1960	
PRESSURE TRANSDUCER	USGS	09/01/1990	07/20/2001
RECORDER	USGS	09/01/1990	07/20/2001
DCP	USGS	07/20/2001	
PRESSURE TRANSDUCER	USGS	07/20/2001	
RECORDER	USGS	07/20/2001	

ZERO ELEVATION -----	STARTING DATE -----
5402.000	08/17/1960
5400.000	10/01/1967

CRESTS*

FLOOD STAGE: 8.00 FT.

MONITOR STAGE: 6.00 FT.

FLOOD FLOW: 7350 CFS

MONITOR FLOW: 3200 CFS

DATE OF CREST	TIME LST	CREST* (ft)	FLOW (CFS)	FROM HIGH WATERMARKS	BASED ON OLD DATUM	CAUSED BY ICE JAM	REMARKS
01/31/1963	UNDEF	10.52	15100				MEASURED CREST 8.21'
12/23/1964	UNDEF	8.65	9100				MEASURED CREST 7.20'
05/24/1967	UNDEF	6.70	4400				MEASURED CREST 4.77'
05/26/1969	UNDEF	6.38	3830				MEASURED CREST 6.54'
01/21/1970	UNDEF	5.98	3170				MEASURED CREST 5.98'
06/26/1971	UNDEF	5.58	2560				MEASURED CREST 5.51'
05/18/1973	UNDEF	6.00	3200				MEASURED CREST 6.00'
11/12/1973	UNDEF	6.21	3540				MEASURED CREST 6.34'
06/01/1975	UNDEF	6.11	3380				MEASURED CREST 6.40'
06/11/1979	UNDEF	6.01	3220				MEASURED CREST 5.98'
01/13/1980	UNDEF	8.25	8000				MEASURED CREST 8.68'
02/16/1982	UNDEF	8.32	8170				MEASURED CREST 8.21'
05/30/1983	UNDEF	8.12	7640				MEASURED CREST 8.02'
11/24/1983	UNDEF	6.16	3460				MEASURED CREST 6.12'
03/08/1986	UNDEF	8.79	9520				MEASURED CREST 8.67'
05/19/1993	UNDEF	5.84	2950				MEASURED CREST 5.53'
03/10/1995	UNDEF	7.42	5910				MEASURED CREST 7.27'
05/15/1996	UNDEF	8.31	8160				MEASURED CREST 7.91'
01/02/1997	UNDEF	11.62	18900				MEASURED CREST 11.78'
03/24/1998	UNDEF	5.63	2640				MEASURED CREST 5.28'
05/28/1999	UNDEF	6.38	3820				MEASURED CREST 6.10'
05/29/2003	UNDEF	5.94	3110				MEASURED CREST 5.60'
05/16/2005	UNDEF	6.99	4960				MEASURED CREST 6.88'
12/31/2005	UNDEF	9.05	10300				MEASURED CREST 9.09'
06/05/2010	UNDEF	6.47	3980				MEASURED CREST 6.35'
06/29/2011	UNDEF	6.57	4160				MEASURED CREST 6.58'

***NOTE: All crest stages listed were converted from crest flows using shift-adjusted USGS Rating Number 19 (shifts in use 8/13/2012). Actual measured crests noted in remarks. Only annual crests greater than 2500 cfs listed above.**

LOW WATER RECORDS*

DATE OF LOW WATER	STAGE* (ft)	FLOW (CFS)	REMARKS
09/21/1960	1.88	22	9/20-25/1960
01/23/1962	1.95	26	
01/12/1963	1.94	25	
10/03/1976	2.02	30	
09/05/1977	1.76	16	9/5-8/1977
11/20/1977	1.85	20	
09/10/1987	1.67	12	9/10-13,23/1987
09/11/1988	1.76	16	
10/01/1988	1.87	21	10/1-2/1988
09/22/1990	2.01	29	
10/16/1990	2.02	30	10/16-17,11/28/1990
01/25/1992	1.94	25	
09/08/1992	2.01	29	9/8,24/1992
09/10/1994	1.85	20	
09/17/2001	2.01	29	9/17,20,23,24/2001
10/17/2001	1.97	27	
09/14/2007	1.94	25	
10/04/2007	2.01	29	10/4, 12/2/2007

***NOTE: All low water stages listed were converted from flows using shift-adjusted USGS Rating Number 19 (shifts in use 8/13/2012). Actual measured low water stages not available. All flows listed are water year minimum mean daily averages. Only annual low water flows less than 30 cfs listed above.**

CONDITIONS AFFECTING FLOW

MILES ABOVE MOUTH: 114.8 DRAINAGE AREA: 276.0

STREAM BED: Pools: Sand & gravel; Main Channel: Cobbles to large boulders.

REACH: Markleeville Ck (0.5 mi US) to confluence w/W Fk Carson R nr
Genoa (~29 river miles DS).

REGULATION: Flow slightly regulated by several small reservoirs, total
capacity, about 5,000 acre-feet.

DIVERSION: A few small diversions above station for irrigation.

WINTER: Subject to freezing during winter months (Nov to March).

TOPOGRAPHY: Gage is in steep, narrow SW-NE oriented canyon w/scattered
brush & pine. Right bank is jagged bedrock 20'-30' high at
gage/cableway. Left bank slopes gradually up to base of 5950'
mountain peak ~1400' N.

REMARKS: Channel straight (oriented SW to NE) ~0.3 mi above to about 200 feet below gage, then
bends right (ENE) for ~900 ft. Control at low-medium flows is
rock/gravel bar ~70' DS; channel is control @ high stages. In Carson
Valley, old river channels may fill during floods; river may cut new
channels w/extensive damage possible.

DAMAGE*

STAGE AREAS AFFECTED

- 5.50 No flooding on the East Fork Carson River. At about 2450 cfs...USGS estimates that this much flow has about a one in 2 chance of occurring any year.
- 6.00 Monitoring stage...no flooding. Residents along the river should prepare for flooding if additional rises due to snowmelt and/or rainfall runoff occur. Flood prone areas in Carson Valley include Washoe Indian Reservation...Carson Valley Country Club...Glenwood Dr...Riverview Dr...Centerville Rd...NV Hwy 88...Westwood Village...Rocky Slough...Dresslerville Rd...Waterloo and Mottsville Lanes. At about 3200 cfs...USGS estimates that this much flow has about a one in 3 chance of occurring any year.
- 6.50 Channel capacity of East Fork Carson River in Carson Valley. Flood preparedness efforts should begin if additional rises due to snowmelt and/or rainfall runoff occur. Flood prone areas in Carson Valley are Washoe Indian Reservation...Carson Valley Country Club...Glenwood Dr...Riverview Dr...Centerville Rd...NV Hwy 88...Westwood Village...Rocky Slough...Dresslerville Rd...Waterloo and Mottsville Lanes. At about 4000 cfs...USGS estimates that this much flow has about a 1 in 4 chance of occurring any year.
- 7.00 Lowest portions of Carson Valley begin to have flood threat. The most flood prone areas in Carson Valley include the Washoe Indian Reservation...Carson Valley Country Club...Glenwood Drive...Riverview Drive...Centerville Road...NV Hwy 88...Westwood Village...Rocky Slough...Dresslerville Road...Waterloo and Mottsville Lanes. At about 5000 cfs...the USGS estimates that this much flow has about a one in 5 chance of being exceeded any year.
- 7.50 Minor lowland flooding in lowest portions of Carson Valley. Flood prone areas include the Washoe Indian Reservation...Carson Valley Country Club...Glenwood Drive...Riverview Drive...Centerville Road...NV Hwy 88...Westwood Village...Rocky Slough...Dresslerville Road...Waterloo and Mottsville Lanes. At about 6100 cfs...the USGS estimates that this much flow has about a one in 7 chance of being exceeded any year.
- 8.00 Flood stage. Minor lowland flooding in Carson Valley. Some low roads...bridges...drainage structures sustain minor damage. Cottonwood Slough begins to flood Lampe Park. Flood prone areas include Washoe Indian Reservation...Carson Valley Country Club...Glenwood Dr...Riverview Dr...Centerville Rd...NV Hwy 88...Westwood Village...Rocky Slough...Waterloo and Mottsville Lanes. About 7350 cfs...USGS estimates there is about a one in 10 chance of this flow being exceeded any year.
- 8.50 Moderate flooding in Carson Valley with some homes...roads and bridges in lower portions of Minden...Gardnerville...Centerville...Washoe Indian Reservation and Genoa flooded. At about 8700 cfs...USGS estimates that this much flow has about a one in 15 chance of being exceeded any year.
- 9.00 Moderate flood damage in Carson Valley area. Flooding of homes...businesses...schools...roads and bridges in lower portions of Minden...Gardnerville...Centerville...Genoa and Washoe Indian Reservation. Transportation...communication...water and power systems begin to be affected. At about 10200 cfs...similar to 12/31/2005 flood. USGS estimates that this much flow has about a one in 20 chance of being exceeded any year.
- 9.50 Major flooding in Carson Valley with significant damage. East Fork Carson River feeds Rocky...Cottonwood...Martin and Henningson Sloughs which flood portions of Minden/Gardnerville downtown areas...causing damage to homes...businesses...schools...roads and bridges. Transportation...communication...water and power systems significantly affected. About 11700 cfs...somewhat larger than 12/31/2005 flood. USGS estimates that this much flow has about a one in 25 chance of being exceeded any year.
- 10.00 Major flooding in Carson Valley with significant damage. The East Fork Carson River feeds Rocky...Cottonwood...Martin...and Henningson Sloughs which flood portions of Minden/Gardnerville downtown areas...causing damage to homes...businesses...schools...roads and bridges. Major effects to transportation...communication...water and power systems. At about 13400 cfs...lower than 2/1/1963 flood. USGS estimates that this much flow has about a one in 33 chance of being exceeded any year.
- 10.50 Major flooding with much of lower Carson Valley flooded...including portions of Minden...Gardnerville...Centerville and Genoa. Significant damage to homes...businesses...schools...roads and bridges. Transportation...communication...water and power systems severely affected. US Hwy 395 closed. At about 15000 cfs...similar to 2/1/1963 flood. USGS estimates that this much flow has about a one in 40 chance of being exceeded any year.
- 11.00 Widespread flood damage in Carson Valley...including Minden/Gardnerville/Genoa/Centerville. Extensive damage to homes...businesses...schools...roads and bridges. Transportation...communication...water and power systems severely affected. Massive bank and channel erosion at these flows is capable of sweeping away buildings...roads and vehicles. At about 16700 cfs...similar to 12/23/1955 flood. USGS estimates that this much flow has about a one in 50 chance of being exceeded any year.

- 11.50 Extensive flooding throughout Carson Valley including Minden/Gardnerville/Genoa/Centerville. Extensive damage to homes...businesses...schools ...roads and bridges. Transportation... communication...water and power systems severely affected. Massive bank and channel erosion...capable of sweeping away buildings...roads and vehicles. At about 18500 cfs...similar to 1/2/1997 flood. About a one in 70 chance of being exceeded any year per USGS estimates.
- 12.00 Record flooding...larger than 1/2/1997 flood. All roads in/out of Carson Valley flooded including Minden/Gardnerville/Genoa. Extensive damage to homes...businesses... schools...roads... bridges. Transportation...communication...water and power systems severely affected. Massive bank and channel erosion...capable of sweeping away buildings...roads...vehicles. 10 by 2 mile portion of Carson Valley underwater. About 20500 CFS...about a one in 90 chance of being exceeded any year per USGS estimates.
- 12.50 Flood disaster with widespread flooding of homes...businesses...schools...levees...roads... bridges through Carson Valley...including Minden/Gardnerville/Genoa/Centerville/Dresslerville. Transportation... communication...water...power systems severely affected. Carson Valley isolated...major highways are flooded. A 12 by 3 mile portion of Carson Valley in Douglas County is underwater. Severe channel bank erosion. At about 22500 cfs...about a one in 120 chance of being exceeded any year per USGS estimates.

***NOTE: Flows given obtained from USGS shift-adjusted Rating Number 19 (shifts in use 8/13/2012)**

RIVER STAGE DATA*

	14-		

	13-		

12.50 - Flood disaster with widespread flooding of homes...businesses...schools...levees	-----		
...roads... bridges through Carson Valley...including Minden/Gardnerville/Genoa	-----		
/Centerville/Dresslerville. Transportation... communication...water...power systems	12-		
severely affected. Carson Valley isolated...major highways are flooded. A 12 by 3 mile	-----		
portion of Carson Valley in Douglas County is underwater. Severe channel bank erosion.	-----	11.62	01/02/1997
At about 22500 cfs...about a one in 120 chance of being exceeded any year per USGS	-----		
estimates.	-----		
12.00 - Record flooding...larger than 1/2/1997 flood. All roads in/out of Carson Valley	11-		
flooded including Minden/Gardnerville/Genoa. Extensive damage to homes...businesses	-----		
...schools...roads... bridges. Transportation...communication...water and power	-----		
systems severely affected. Massive bank and channel erosion...capable of sweeping	-----	10.52	01/31/1963
away buildings...roads...vehicles. A 10 by 2 mile portion of Carson Valley is	-----		
flooded. About 20500 CFS...about a one in 90 chance of being exceeded any year per	10-		
USGS estimates.	-----		
11.50 - Extensive flooding throughout Carson Valley including Minden/Gardnerville/Genoa/	-----		
Centerville. Extensive damage to homes...businesses...schools...roads and bridges.	-----		
Transportation... communication...water and power systems severely affected.	-----		
Massive bank and channel erosion...capable of sweeping away buildings...roads	9-	9.05	12/31/2005
and vehicles. At about 18500 cfs...similar to 1/2/1997 flood. About a one in 70	-----		
chance of being exceeded any year per USGS estimates.	-----	8.79	03/08/1986
	-----	8.65	12/23/1964
11.00 - Widespread flood damage in Carson Valley...including Minden/Gardnerville/Genoa/	-----	8.32	02/16/1982
Centerville. Extensive damage to homes...businesses...schools...roads and bridges.	8-	8.31	05/15/1996
Transportation...communication...water and power systems severely affected.	-----	8.25	01/13/1980
Massive bank and channel erosion at these flows is capable of sweeping away	-----	8.12	05/30/1983
buildings...roads and vehicles. At about 16700 cfs...similar to 12/23/1955 flood.	-----	7.42	03/10/1995
USGS estimates that this much flow has about a one in 50 chance of being exceeded	-----		
any year.	7-	6.99	05/16/2005
	-----	6.70	05/24/1967
10.50 - Major flooding with much of lower Carson Valley flooded...including portions of	-----	6.57	06/29/2011
Minden...Gardnerville...Centerville and Genoa. Significant damage to	-----	6.47	06/05/2010
homes...businesses...schools...roads and bridges. Transportation...communication	-----	6.38	05/28/1999
...water and power systems severely affected. US Hwy 395 closed. At about 15000	6-	6.38	05/26/1969
cfs...similar to 2/1/1963 flood. USGS estimates that this much flow has about a one	-----	6.21	11/12/1973
in 40 chance of being exceeded any year.	-----	6.16	11/24/1983
10.00 - Major flooding in Carson Valley with significant damage. The East Fork Carson River	-----	6.11	06/01/1975
feeds Rocky...Cottonwood...Martin...and Henningson Sloughs which flood portions of	-----	6.01	06/11/1979
Minden/Gardnerville downtown areas...causing damage to homes...businesses...schools	5-	6.00	05/18/1973
...roads and bridges. Major effects to transportation...communication...water and	-----	5.98	01/21/1970
power systems. At about 13400 cfs...lower than 2/1/1963 flood. USGS estimates that	-----	5.94	05/29/2003
this much flow has about a one in 33 chance of being exceeded any year.	-----	5.84	05/19/1993
9.50 - Major flooding in Carson Valley with significant damage. East Fork Carson River	-----	5.58	06/26/1971
feeds Rocky...Cottonwood...Martin and Henningson Sloughs which flood portions of	4-	5.35	05/24/2000
Minden/Gardnerville downtown areas...causing damage to homes...businesses...schools			
...roads and bridges. Transportation... communication...water and power systems			
significantly affected. About 11700 cfs...somewhat larger than 12/31/2005 flood.			
USGS estimates that this much flow has about a one in 25 chance of being exceeded any year.			
9.00 - Moderate flood damage in Carson Valley area. Flooding of homes...businesses...schools...roads and			
bridges in lower portions of Minden...Gardnerville...Centerville...Genoa and Washoe Indian			
Reservation. Transportation...communication...water and power systems begin to be affected. At			
about 10200 cfs...similar to 12/31/2005 flood. USGS estimates that this much flow has about a one			
in 20 chance of being exceeded any year.			
8.50 - Moderate flooding in Carson Valley with some homes...roads and bridges in lower portions of			
Minden...Gardnerville...Centerville...Washoe Indian Reservation and Genoa flooded. At about 8700			
cfs...USGS estimates that this much flow has about a one in 15 chance of being exceeded any year.			
8.00 - Flood stage. Minor lowland flooding in Carson Valley. Some low roads...bridges...drainage structures sustain			
minor damage. Cottonwood Slough begins to flood Lampe Park. Flood prone areas include Washoe Indian			
Reservation...Carson Valley Country Club...Glenwood Dr...Riverview Dr...Centerville Rd...NV Hwy 88...Westwood			
Village...Rocky Slough...Waterloo and Mottville Lanes. About 7350 cfs...USGS estimates there is about a one			
in 10 chance of this flow being exceeded any year.			
7.50 - Minor lowland flooding in lowest portions of Carson Valley. Flood prone areas include the Washoe			
Indian Reservation...Carson Valley Country Club...Glenwood Drive...Riverview Drive...Centerville			
Road...NV Hwy 88...Westwood Village...Rocky Slough...Dresslerville Road...Waterloo and Mottville			
Lanes. At about 6100 cfs...the USGS estimates that this much flow has about a one in 7 chance of			
being exceeded any year.			

REACH: Markleeville Ck (0.5 mi US) to confluence w/W Fk Carson R nr Genoa (~29 mi. DS).
 ELEVATION ZERO: 5400.00

*NOTE: Flows given obtained from USGS shift-adjusted Rating Number 19 (shifts in use 8/13/2012)

CONTACTS

SQ	CONTACT/REMARKS	PHONE
1	<p>USGS WRD-Carson City NV snberris@usgs.gov, mgipson@usgs.gov USGS responsible for gage maintenance. Stephen Berris is USGS NV Data Chief. Marsha Gipson is Carson City field office chief (887-7626). Doug Hutchinson (887-7713), Jim Swartwood (887-7682) & Jim Crompton (887-7681) can also assist.</p>	775-887-7693
2	<p>US Water Master cblanchard@uswatermaster.org Chief Deputy Water Master Chad Blanchard in Reno uses gage data for flood & water supply mgt.</p>	775-784-5241
3	<p>Julian Larrouy Deputy Water Master for Carson River Basin above Lahontan. Very knowledgeable of flow/damage relationships on Carson River.</p>	
4	<p>Douglas Co. S.O. rpierini@co.douglas.nv.us Ron Pierini is Douglas Co. Sheriff. Closely monitors E Fk Carson River as has high impact on flooding in Minden/Gardnerville. Douglas S.O. can provide info about current flood conditions & effects.</p>	775-782-5126
5	<p>Douglas Co. OEM tcarlini@eastforkfire.org Todd Carlini is Emergency Manager, knowledgeable and helpful w/flood info for Douglas Co.</p>	775-782-9048
6	<p>Carson City OEM sgiomi@carson.org Stacey Giomi is Fire Chief and EM. Monitors gage for flood planning purposes.</p>	775-283-7150
7	<p>Carson City S.O. KFurlong@carson.org Ken Furlong is Sheriff, direct phone is 775-887-2020 x41901. S.O. monitors gage for flood planning purposes.</p>	775-887-2500
8	<p>Alpine Co. S.O. jcrawford@alpineso.com John Crawford is Alpine County S.O., knowledgeable about flooding in Alpine County.</p>	530-694-2231
9	<p>Lyon Co. SO/OEM aveil@lyon-county.org (Sheriff); jpage@lyon-county.org (EM) Lyon Co Sheriff is Alan Veil; Captain Jeff Page is EM, Office:775-463-6531 OR 463-6620 X10. Closely watches Carson River forecasts as has high impact on Lyon Co flooding. Knowledgeable about flood impacts in Lyon Co.</p>	775-463-6620
10	<p>Truckee-Carson Irrigation District General: info@tcid.org TCID monitors gage for Lahontan Resv inflow planning. O&M Foreman: Walt Winder, Kate Rotan is TCID Office Manager, Rusty Jardine is TCID Project Mgr</p>	775-423-2141

MAP 1 OF GAGE LOCATION

Including locations of other USGS gages on the East Fork, West Fork and Mainstem Carson River (as of 8/22/2012)

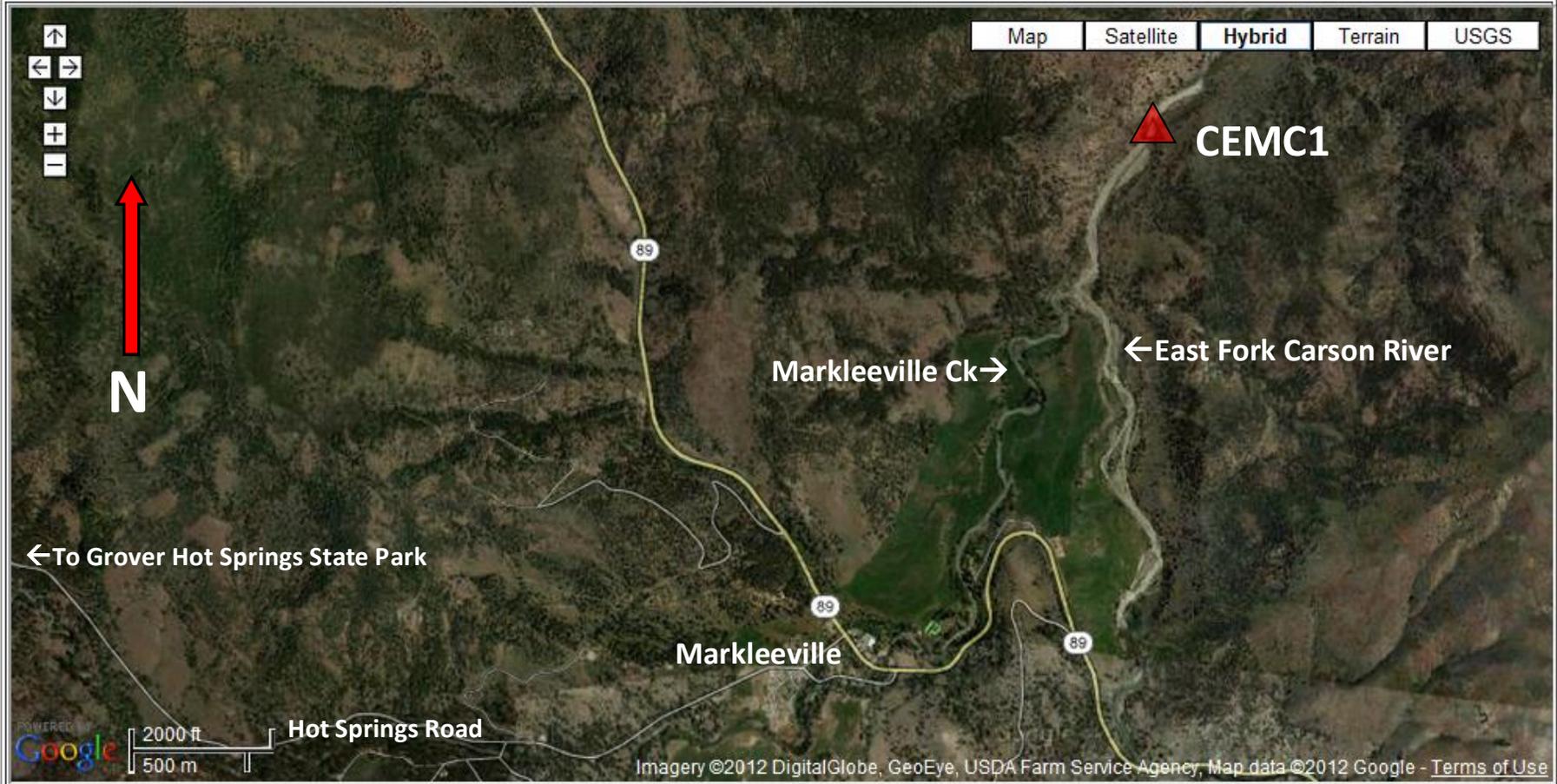
LATITUDE: 38 42 53N LONGITUDE: 119 45 50W

Map Source: <http://upload.wikimedia.org/wikipedia/commons/e/ec/Carsonrivermap.png>

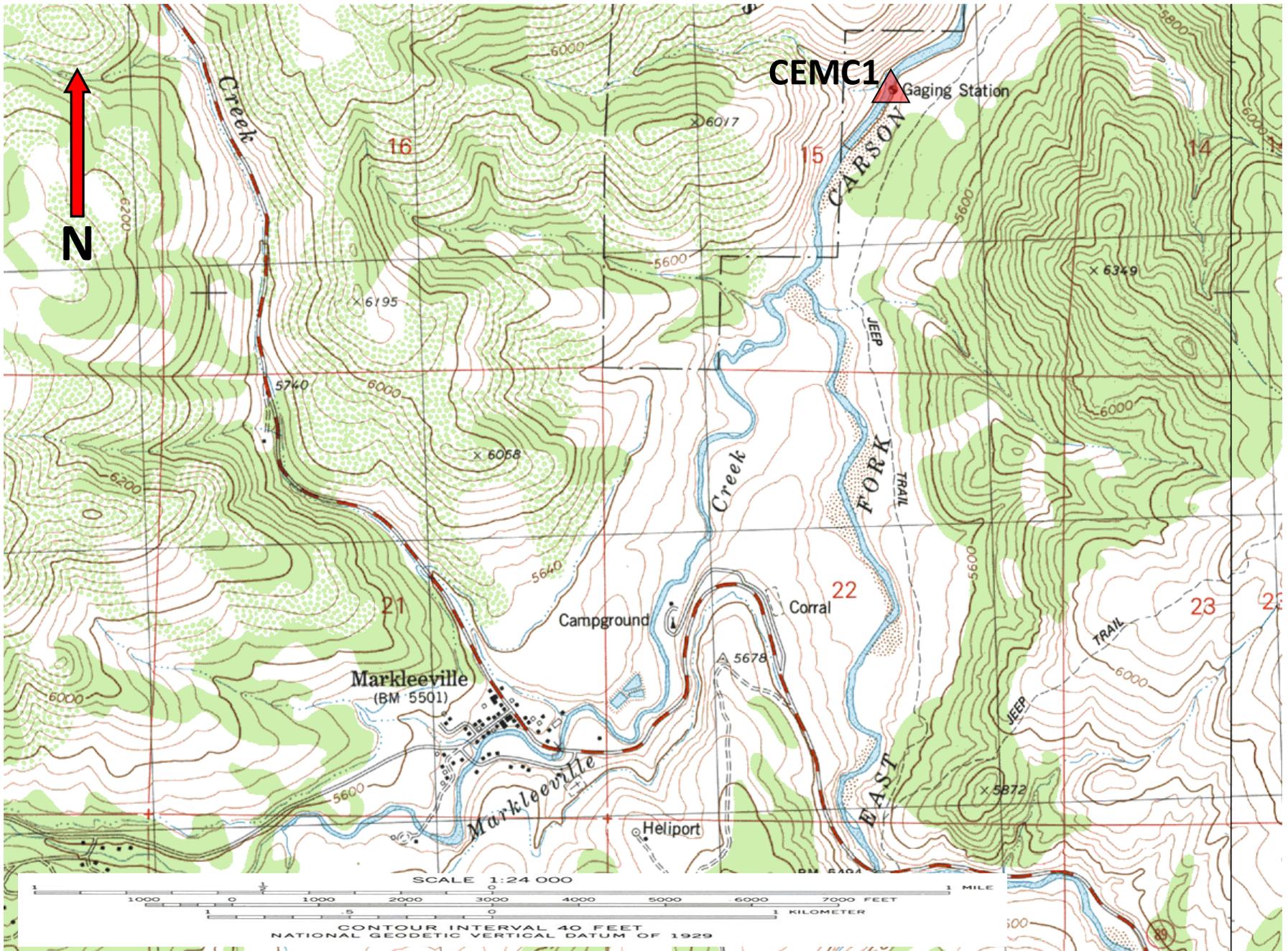


Alpine County, California
Hydrologic Unit Code 16050201
Latitude 38°42'53", Longitude 119°45'50" NAD27
Drainage area 276 square miles
Gage datum 5,400.00 feet above NGVD29

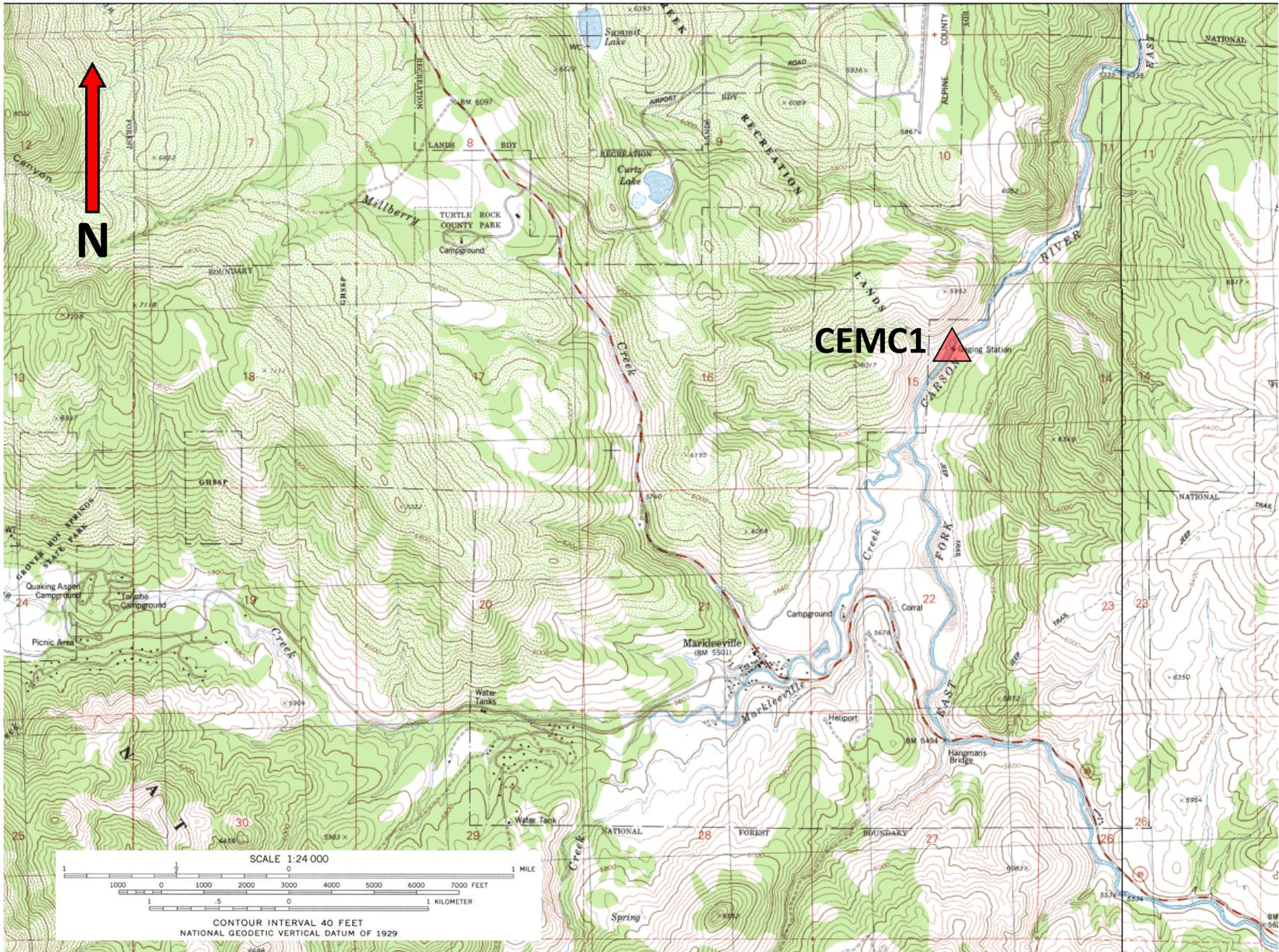
Location of the site in California.



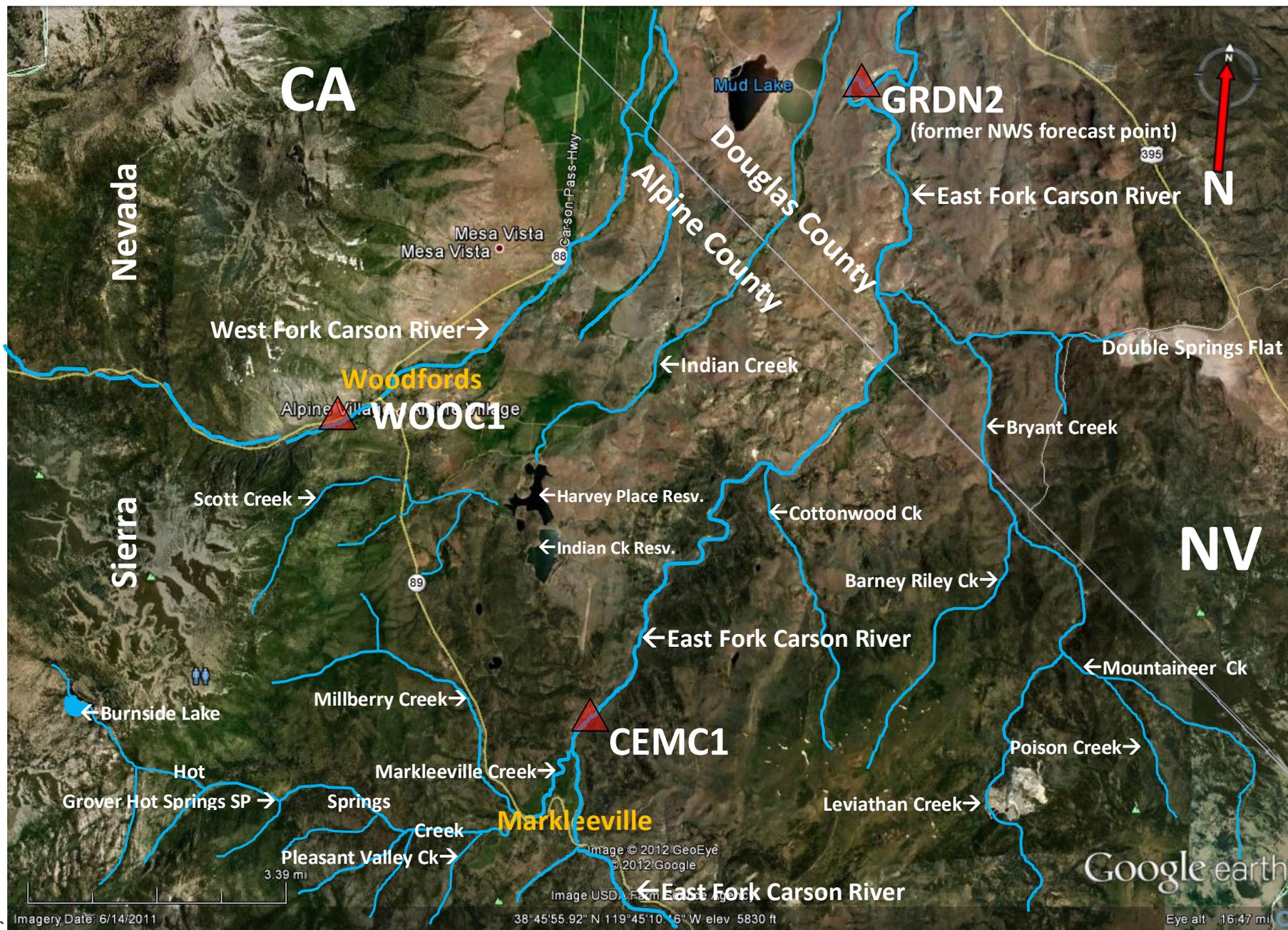
Map 2 of gage location. Aerial view of area near USGS Gage #10308200; E Fork Carson River below Markleeville Ck nr Markleeville, CA
(From USGS Website: http://waterdata.usgs.gov/nv/nwis/nwismap/?site_no=10308200&agency_cd=USGS)



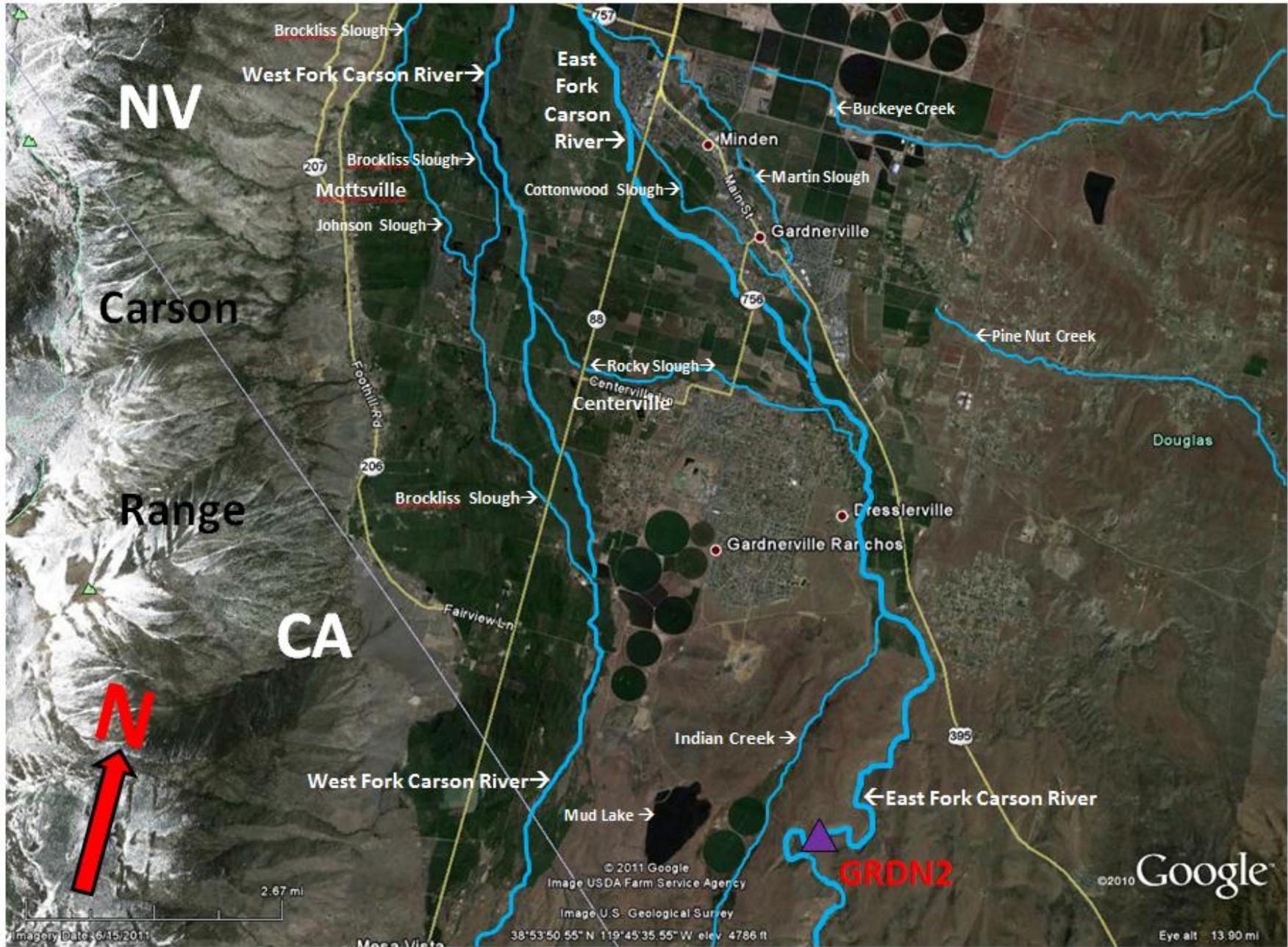
Map 3 of gage location, showing topography/hydrology of the area between Markleeville and CEMC1.
 From USGS Markleeville CA 1:24000 scale topographic map.



Map 4 of gage location, showing topography/hydrology of the area between Grover Hot Springs to DS of CEMC1.
 From USGS Markleeville CA 1:24000 scale topographic map.



Map 4 of gage location: Aerial view of upper reaches of the East and West Forks Carson River in the Markleeville-Woodfords area.



Map 5: Aerial view of southern Carson Valley with primary rivers and streams, from East Fk Carson River near Gardnerville gage (GRDN2) north to near confluence with West Fork Carson River near Genoa.

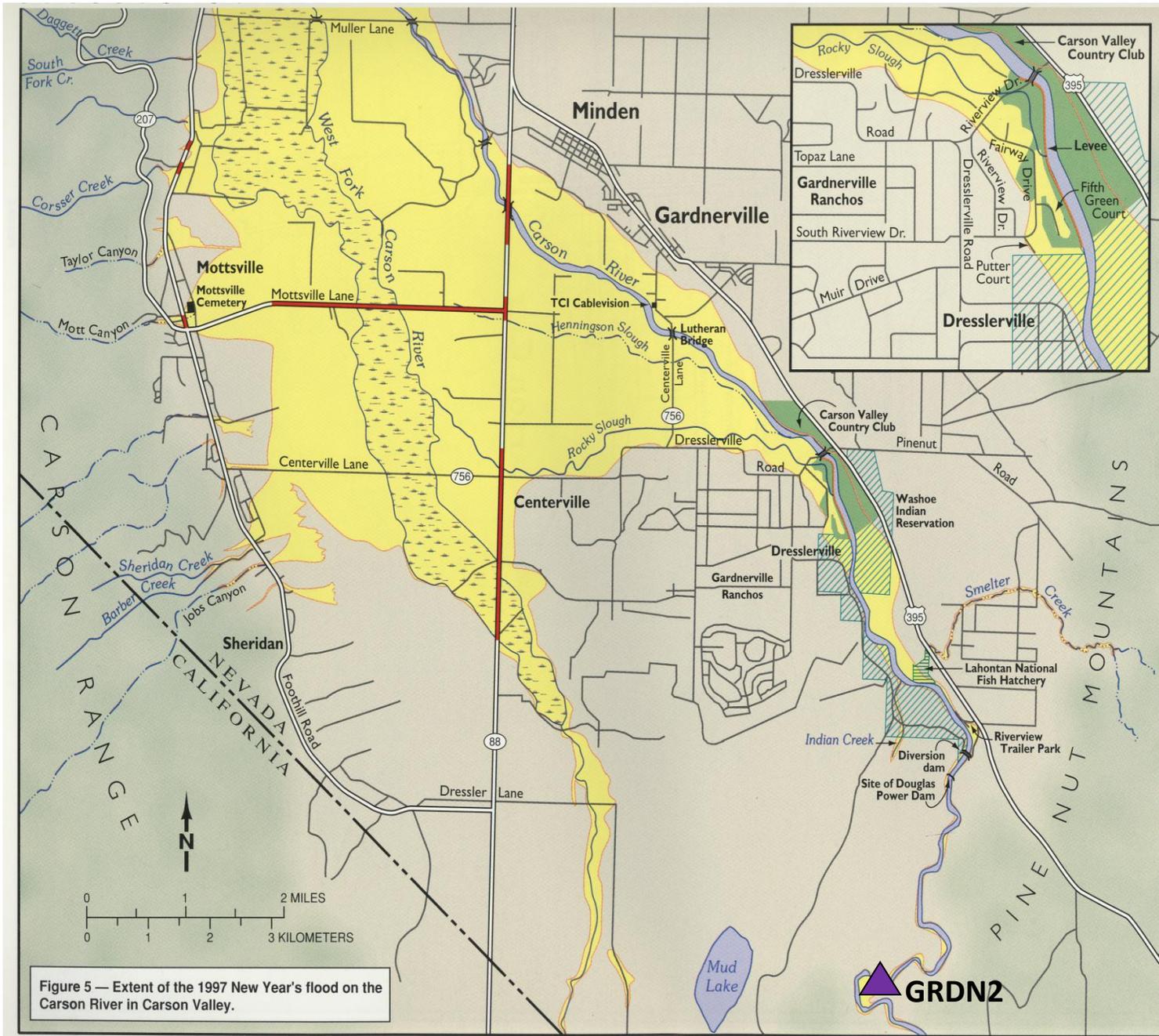
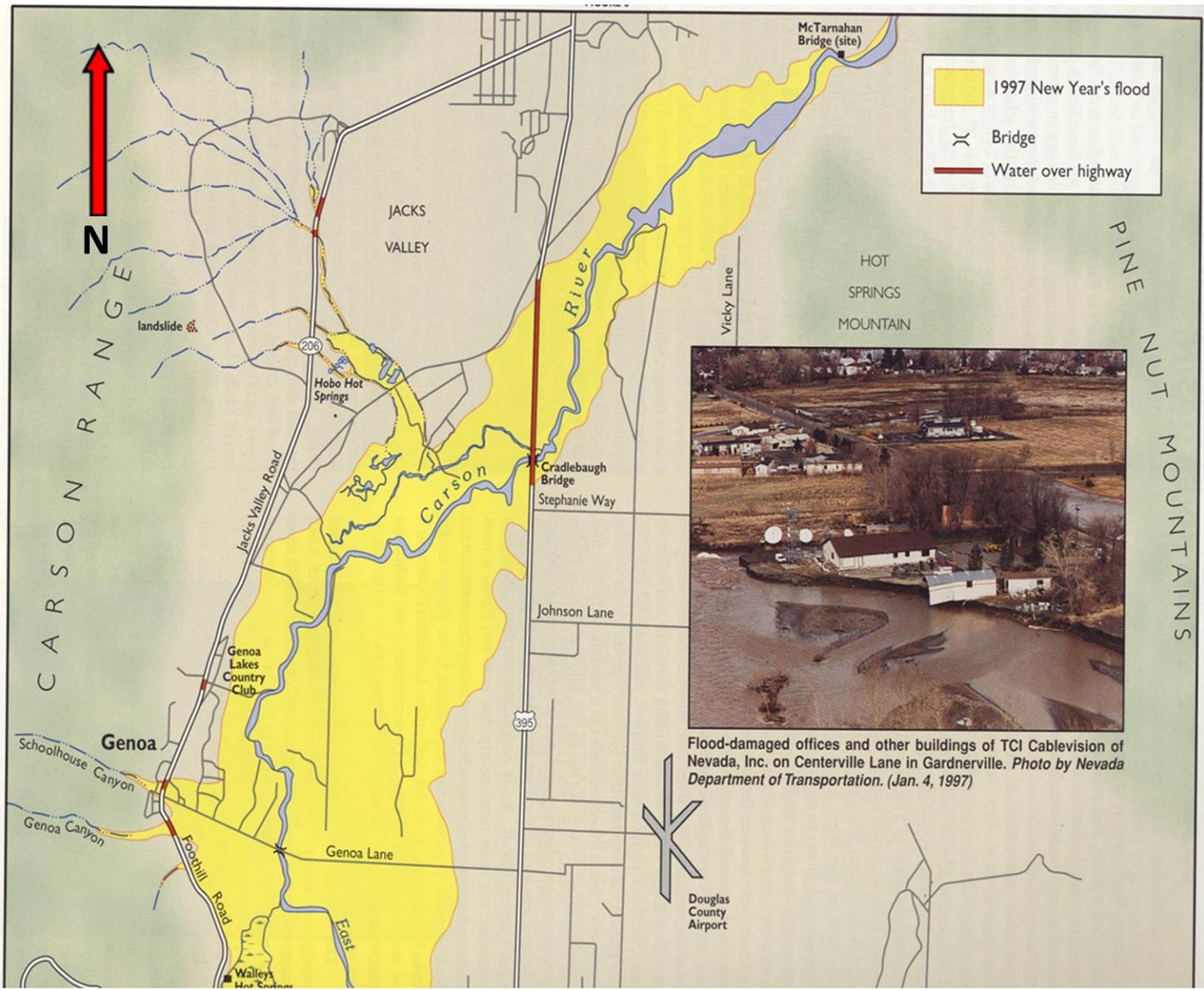
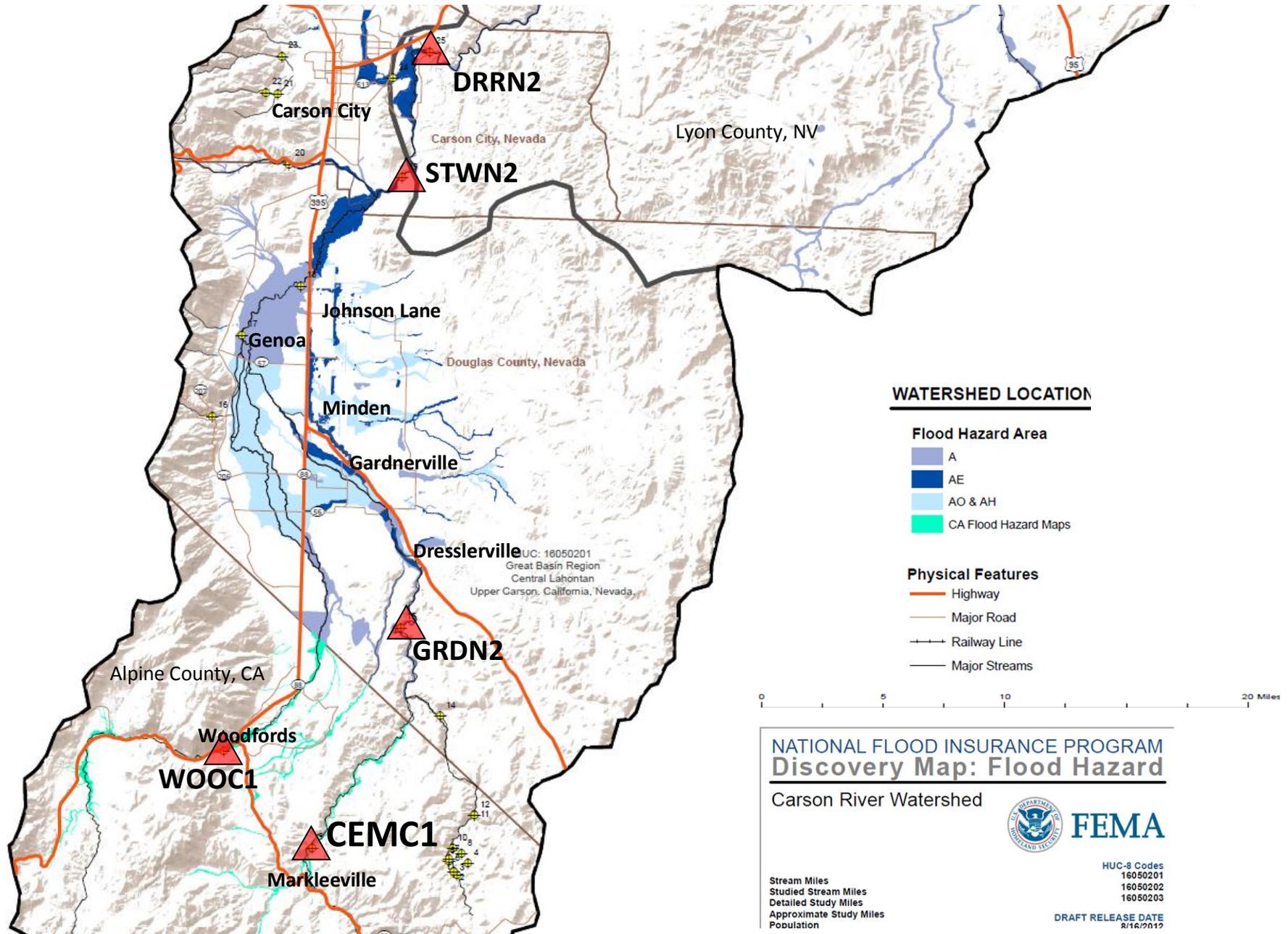


Figure 5 — Extent of the 1977 New Year's flood on the Carson River in Carson Valley.

Extent of the 1977 New Year's Flood in the southern Carson Valley. East Fork Carson R below Markleeville Ck nr Markleeville (CEMC1) crested at 18,900 cfs, which USGS estimates has a recurrence probability of about 1 in 70 any year. Near Gardnerville (GRDN2), the river crested at 20,300 cfs, which USGS estimated has a recurrence probability of about 1 in 150 any year. The West Fork Carson River at Woodfords (WOOC1) crested at 8,100 cfs, which has an estimated recurrence probability of about 1 in 300 any year (USGS, 2007). From: "The 1977 New Year's Floods in Western Nevada", NV Bureau of Mines and Geology Special Publication 23, 1998



Extent of the 1997 New Year's Flood in the northern Carson Valley. From: "The 1997 New Year's Floods in Western Nevada", NV Bureau of Mines and Geology Special Publication 23, 1998.



FEMA Flood Hazard Zones on the Carson River Watershed in Alpine, Douglas and Carson City. Flood Hazard Zones A, AE, AO and AH are FEMA special flood hazard areas subject to Inundation by the 1% chance (1 in 100 chance any year) flood event.
 From FEMA Flood Insurance Rate Maps.



Gage house and old stilling well, CEMC1, 6/18/2012. View WNW. Stage 2.78', 160 cfs.



Upstream view (SW) from stilling well, CEMC1, 6/18/2012, 2.78', 160 CFS.



Upstream view (SW) from below stilling well, CEMC1, 6/18/2012, 2.78', 160 CFS.



Rock and gravel bar control about 70 ft. DS of gage. View W. 6/18/2012, 2.78', 160 CFS.



Downstream view (NNW) from above stilling well 6/18/2012, 2.78', 160 CFS.



Downstream view (NNE) from below gage. 6/18/2012, 2.78', 160 CFS.



Inside gage house showing equipment: (1) Sutron Accububble self-purge pressure transducer; (2) Sutron Satlink DCP with datalogger, model SLC2-ENC; (3) Measurement info (rating, station description, measurement record). All equipment need for making measurements (high and low water) are kept inside gagehouse.



Staff gage on old stilling well; range: 0 to 6.74 feet. 6/18/2012, 2.78', 160 CFS.



Cableway on R bank, view is to NW. Rock & gravel bar control visible center right of photo.
6/18/2012, 2.78', 160 CFS.



Old stilling well and crest stage gage. 6/18/2012, 2.78', 160 CFS.