

# Updated Elevations for South Louisiana

Presentation to Louisiana DOTD

Mar. 20, 2006

Presented By: Denis Riordan, Geodetic Advisor to Louisiana





**RATES OF VERTICAL DISPLACEMENT AT  
BENCHMARKS IN THE LOWER  
MISSISSIPPI VALLEY AND THE  
NORTHERN GULF COAST**

Kurt D. Saylor  
National Geospatial Survey

Dr. Roy K. Roaka  
Louisiana State University

July, 2004

U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
National Ocean Service





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[Updated Elevations for Coastal Louisiana](#)

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Imagery of the coast of Texas and Louisiana after hurricane Rita made landfall.



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# The NGS Data Sheet

DATABASE = Sybase ,PROGRAM = datasheet, VERSION = 7.31

1 National Geodetic Survey, Retrieval Date = MARCH 17, 2006

```

BJ3209 *****
BJ3209 HT_MOD      - This is a Louisiana Height Modernization Survey Station.
BJ3209 CBN        - This is a Cooperative Base Network Control Station.
BJ3209 DESIGNATION - U 362
BJ3209 PID        - BJ3209
BJ3209 STATE/COUNTY- LA/ST MARTIN
BJ3209 USGS QUAD   - CECILIA (1970)
    
```

\*CURRENT SURVEY CONTROL

```

BJ3209* NAD 83 (1992)- 30 18 07.53934(N)    091 50 52.80638(W)    ADJUSTED
BJ3209* NAVD 88      -          6.32 *(meters)    20.7 *(feet)    LEVELING(2004.65)
BJ3209 **This station is located in a subsidence area (see below).
BJ3209 **This station is included in the VTDP model (see below).
BJ3209
BJ3209 EPOCH DATE   -          2004.65
BJ3209 X           -   -177,732.880 (meters)                COMP
BJ3209 Y           -   -5,508,551.218 (meters)              COMP
BJ3209 Z           -    3,199,320.855 (meters)              COMP
BJ3209 LAPLACE CORR-          0.26 (seconds)                DEFLEC99
BJ3209 ELLIP HEIGHT-   -21.07 (meters)                    (06/22/05) GPS OBS
BJ3209 GEOID HEIGHT-   -27.42 (meters)                    GEOID03
BJ3209 DYNAMIC HT   -    6.31 (meters)                    20.7 (feet)    COMP
BJ3209 MODELED GRAV-   979,318.0 (mgal)                    NAVD 88
BJ3209
BJ3209 HORZ ORDER   - B
BJ3209 VERT ORDER   - THIRD
    
```



DATABASE = Sybase ,PROGRAM = datasheet, VERSION = 7.31

1 National Geodetic Survey, Retrieval Date = MARCH 17, 2006

BK0696 \*\*\*\*\*

BK0696 HT\_MOD - This is a Louisiana Height Modernization Survey Station.

BK0696 DESIGNATION - P 163

BK0696 PID - BK0696

BK0696 STATE/COUNTY- LA/JEFFERSON DAVIS

BK0696 USGS QUAD - MERMENTAU (1984)

BK0696

BK0696 \*CURRENT SURVEY CONTROL

BK0696

BK0696\* NAD 83(1992)- 30 11 35.07404(N) 092 36 39.75381(W) ADJUSTED

BK0696\* NAVD 88 - 3.45 \*(meters) 11.3 \*(feet) LEVELING(2004.65)

BK0696 \*\*This station is located in a subsidence area (see below).

BK0696 \*\*This station is included in the VTDP model (see below).

BK0696

BK0696 EPOCH DATE - 2004.65

BK0696 X - -251,352.732 (meters) COMP

BK0696 Y - -5,511,774.977 (meters) COMP

BK0696 Z - 3,188,879.469 (meters) COMP

BK0696 LAPLACE CORR- -0.23 (seconds) DEFLEC99

BK0696 ELLIP HEIGHT- -23.82 (meters) (06/22/05) GPS OBS

BK0696 GEOID HEIGHT- -27.29 (meters) GEOID03

BK0696 DYNAMIC HT - 3.44 (meters) 11.3 (feet) COMP

BK0696 MODELED GRAV- 979,305.9 (mgal) NAVD 88

BK0696

BK0696 HORZ ORDER - B

BK0696 VERT ORDER - THIRD

BK0696 ELLP ORDER - FOURTH CLASS I

BK0696

BK0696.The horizontal coordinates were established by GPS observations

BK0696.and adjusted by the National Geodetic Survey in June 2005..

BK0696.The horizontal coordinates are valid at the epoch date displayed above.

BK0696.The epoch date for horizontal control is a decimal equivalence

BK0696.of Year/Month/Day.

BK0696

BK0696 \*\* Due to the variability of land subsidence, the orthometric, ellipsoid,

BK0696 \*\* and geoid heights are valid at the date of observation. These heights

BK0696 \*\* must always be validated when used as control.

BK0696 \*\* The orthometric height was determined with a Vertical Time-dependent

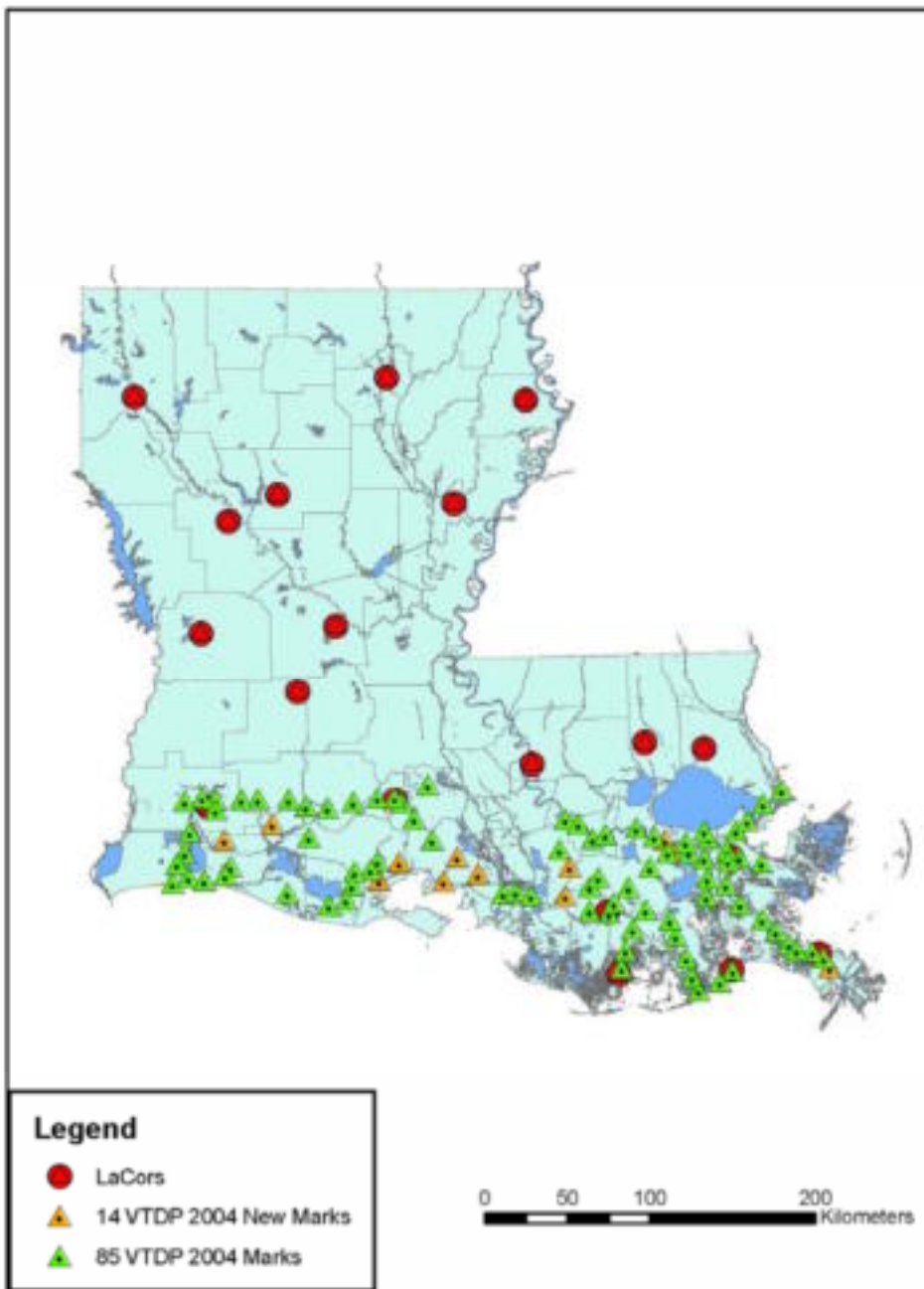
BK0696 \*\* Positioning (VTDP) model and has been validated through GPS observations

BK0696 \*\* for the epoch indicated (see [www.ngs.noaa.gov/heightmod/VTDP](http://www.ngs.noaa.gov/heightmod/VTDP)).

BK0696 \*\* The geoid height was determined by a new realization of GEOID03 for the

BK0696 \*\* epoch indicated which incorporates improved geoid heights for the

# Louisiana NAVD88 Epoch 2004



NATIONAL GEOD



National C

12/12/2005



DESIGNATION	PID	NAD83	NAD83	NAVD88	NAVD88	NEW-	NEW-
		LATITUDE	LONGITUDE	EPOCH (2004)	OLD	OLD	OLD
						METERS	FEET
L 278	AT0332	29523417152	89534538515	2.11	2.25	-0.14	-0.47
N 278	AT0351	29523059456	89572221178	1.46	1.62	-0.16	-0.52
Q 368	AU2123	29523306429	90065521761	0.71	0.85	-0.14	-0.47
G 365	AU2110	29543952074	90124630724	0.24	0.34	-0.10	-0.33
E 299	AU0332	29545014023	90204160012	0.70	0.83	-0.13	-0.42
G 165	AU0316	29495776847	90274192983	0.37	0.48	-0.11	-0.37
876 1899 B TIDAL	AU2310	29400204511	90063355694	0.01	0.14	-0.13	-0.43
B 369	AU2163	29460546861	90060168847	1.84	1.98	-0.14	-0.44
V 375	AT0760	29550155070	89581804218	0.71	0.89	-0.18	-0.59
J 370	AT0733	29190227854	89231779771	-1.23	-1.22	-0.01	-0.05
S 188	AU0520	29580031253	90134530473	2.35	2.47	-0.12	-0.39
A 148	AU0429	29592098734	90051421492	1.77	1.92	-0.15	-0.48
WASTE WELL 2 RESET	BH1089	30012271456	89544679801	1.43	1.55	-0.12	-0.40
C 189	BH1119	30042449899	89502590012	0.63	0.79	-0.16	-0.54
PIKE RESET	BH1164	30095967858	89441466961	2.48	2.63	-0.15	-0.49
A 193	BH1212	30141940273	89371040720	0.75	0.88	-0.13	-0.42
S 379	BJ3744	30030339141	90322569751	4.31	4.48	-0.17	-0.56
NAPA	--new--	29505205443	90574398906	4.54			
DOKKA	--new--	29411929575	90592877881	2.30			
REGGIO 2	AT0804	29504071916	89453243079	1.53	1.71	-0.18	-0.60
LSU 39	--new--	30003237250	93074337482	1.59			
876 1724 TIDAL 11	AT0685	29155327913	89572708157	0.95	1.21	-0.26	-0.87
N 221	AU1291	29121650784	90022425833	1.66	1.88	-0.22	-0.73
H 359	AU2042	29092612122	90103154663	1.45	1.64	-0.19	-0.62
ZURFLUH	--new--	29590411829	90214060458	1.50			
G 358	AU2028	29273886103	90183116586	0.82	1.01	-0.19	-0.61
F 220	AU1091	29361874979	90292347775	1.70	1.89	-0.19	-0.63
B 358	AU2014	29433993287	90355266246	3.24	3.38	-0.14	-0.45
N 367	AT0731	29210829728	89272567564	0.34	0.47	-0.13	-0.43
X 276	AU0272	29441336672	90501548661	1.63	1.87	-0.24	-0.79
CLUB	AU0286	29470822026	90470498763	4.69	4.97	-0.28	-0.91
194/2 CAP	AU1510	29594433130	90484715772	5.69	5.96	-0.27	-0.88

DESIGNATION	PID	NAD83	NAD83	NAVD88	NAVD88	NEW- OLD	NEW- OLD
		LATITUDE	LONGITUDE	EPOCH (2004)	OLD	METERS	FEET
C 195	AT0458	29321240304	89454715604	0.48	0.71	-0.23	-0.74
G 95	BJ0710	30000235269	90254492714	8.27	8.48	-0.21	-0.70
MILAN 2	AT0200	29280574368	89405372992	-0.15	0.01	-0.16	-0.51
A 152	AT0407	29372858854	89541066914	0.67	0.87	-0.20	-0.66
D 194	AT0357	29513721031	89581550368	1.68	1.83	-0.15	-0.51
EMPIRE AZ MK 2 1934 1966	AT0231	29233814522	89361136779	-0.01	0.13	-0.14	-0.46
R 194	AT0376	29434641362	89591715194	1.39	1.55	-0.16	-0.54
C 279	AT0247	29215030281	89332242552	-0.23	-0.10	-0.13	-0.43
R 210	BK1406	30133876097	93111361743	3.77	3.99	-0.22	-0.72
E 356	BK2249	30141377880	93155797503	3.73	3.94	-0.21	-0.70
4164 LAGS RESET 1959	BK1468	30130202707	93223382845	3.37	3.53	-0.16	-0.51
D 211	BK1484	30030282215	93202951460	1.21	1.38	-0.17	-0.55
TT 147 USGS	AV0338	29561291235	93223136746	2.05	2.16	-0.11	-0.37
V 211	AV0346	29524370698	93253302157	1.10	1.21	-0.11	-0.37
F 212	AV0360	29461868586	93270486234	1.04	1.15	-0.11	-0.37
M 212	AV0375	29481488055	93205665170	1.04	1.20	-0.16	-0.53
10 V 28	BK1612	30102160647	93104651129	4.73	5.04	-0.31	-1.02
D 215	AV0426	29513754814	93051570543	0.68	0.97	-0.29	-0.95
C 213	AV0399	29485668195	93072245481	0.72	0.96	-0.24	-0.78
V 212	AV0390	29471598269	93150401135	1.16	1.33	-0.17	-0.55
R 295	BJ0634	30062382307	90590815295	9.24	9.47	-0.23	-0.75
P 228	AU1624	29563004441	91012291659	5.82	6.07	-0.25	-0.83
Z 221	AU1436	29352033440	90431348333	1.46	1.65	-0.19	-0.62
R 227	AU1415	29362032925	90501971450	1.47	1.74	-0.27	-0.88
R 155	AU1126	29324582932	90202074260	1.26	1.46	-0.20	-0.67
JESSE	AU1255	29140622688	90123519281	0.37	0.57	-0.20	-0.66
G 233	AU1299	29295771662	90343785736	1.04	1.22	-0.18	-0.60
S 233	AU1309	29230873595	90371227722	2.91	3.10	-0.19	-0.61
E 191	BJ1655	30010727900	90435057510	4.39	4.62	-0.23	-0.76
L051	--new--	29485439125	91321654959	1.96			
B 201	AU0179	29422745776	91225998292	2.71	2.92	-0.21	-0.68
V 275	AU0193	29425248273	91180284424	2.00	2.25	-0.25	-0.81



DESIGNATION	PID	NAD83	NAD83	NAVD88	NAVD88	NEW- OLD	NEW- OLD
		LATITUDE	LONGITUDE	EPOCH (2004)	OLD	METERS	FEET
F 198	AU0218	29413876792	91121607405	2.38	2.61	-0.23	-0.74
A 4100 LAGS	--new--	29543319364	91395498279	4.47			
R 277	BJ2179	30002049072	91491776506	5.28	5.33	-0.05	-0.17
F 198	AU0218	29413876792	91121607405	2.38	2.61	-0.23	-0.74
A 4100 LAGS	--new--	29543319364	91395498279	4.47			
R 277	BJ2179	30002049072	91491776506	5.28	5.33	-0.05	-0.17
D 171	BJ2147	30071179192	91560595115	10.34	10.42	-0.08	-0.27
28 A 015	BK0241	30124580911	92002363315	10.77	10.92	-0.15	-0.48
U 266	BK0223	30140620109	92032005051	11.39	11.50	-0.11	-0.35
Q 164	BK0208	30140548358	92094858139	10.35	10.62	-0.27	-0.87
416	BK0182	30125074581	92185252836	6.06	6.35	-0.29	-0.96
X 267	BK0159	30104963759	92283684848	4.32	4.55	-0.23	-0.77
P 163	BK0696	30113507404	92363975381	3.45	3.77	-0.32	-1.06
K 267	BK0662	30135457864	92432578213	5.52	5.74	-0.22	-0.71
LACAS AZ MK	BK0629	30135315701	92550002884	5.97	6.21	-0.24	-0.78
A 4172	BK1435	30135257806	93011680979	5.81	6.04	-0.23	-0.75
Q 359	AU2033	29200689485	90143542299	0.92	1.12	-0.20	-0.66
876 0849 A TIDAL	--new--	29160052805	89211035554	0.86			
DREUX 2	AU3293	29172394941	90385422013	0.59	0.70	-0.11	-0.36
RIVER MISSISSIPPI MP 65	BJ1112	30045648728	90541068208	6.14	6.35	-0.21	-0.69
C 4051 RESET	--new--	29525799706	92014955061	1.83			
D 380	AV0573	29531929214	92100285488	0.95	1.01	-0.06	-0.18
57 V 35	AV0250	29503189578	92123852315	1.13	1.23	-0.10	-0.34
57 V 96 LADH	--new--	29470417535	92092436729	0.98			
57 V 120 LADTD	BK0907	30011541983	92355562355	1.90	2.16	-0.26	-0.84
27 V 27 LADTD	--new--	30054567843	92493053102	1.91			
X 215	AV0079	29390277876	92281092867	1.16	1.41	-0.25	-0.83
DOLAND AZ MK	AV0295	29430716449	92435477307	0.68	0.86	-0.18	-0.58
E 380	AV0571	29495737966	92182518459	5.10	5.16	-0.06	-0.19
L 223	AV0171	29452914106	92194734236	1.37	1.48	-0.11	-0.36
F 382	AV0566	29404226345	92214771143	1.13	1.29	-0.16	-0.53
L 044	--new--	29464564440	91450565453	1.94			

<i>DESIGNATION</i>	<i>PID</i>	<i>NAD83 LATITUDE</i>	<i>NAD83 LONGITUDE</i>	<i>NAVD88 EPOCH (2004)</i>	<i>NAVD88 OLD</i>	<i>NEW- OLD METERS</i>	<i>NEW- OLD FEET</i>
PBM BULLY CAMP	--new--	29281734122	90202848013	0.60			
ALCO	BJ1342	30013652293	90064621053	1.87	2.01	-0.14	-0.45
BA01 SM01	--new--	29550164871	90185855731	1.82			
SAVOIE RESET	AU3539	29384666836	90411872528	2.01	2.23	-0.22	-0.71
U 362	BJ3209	30180753934	91505280638	6.32	6.38	-0.06	-0.20
JCLS 000M	--new--	30131483688	92031588117	10.25			

Note that the GEOID03 file #7, which covers the coastal Louisiana region, has been modified. It has been updated based on the most recent VTDP model for the region to better reflect the actual orthometric heights at the bench marks.

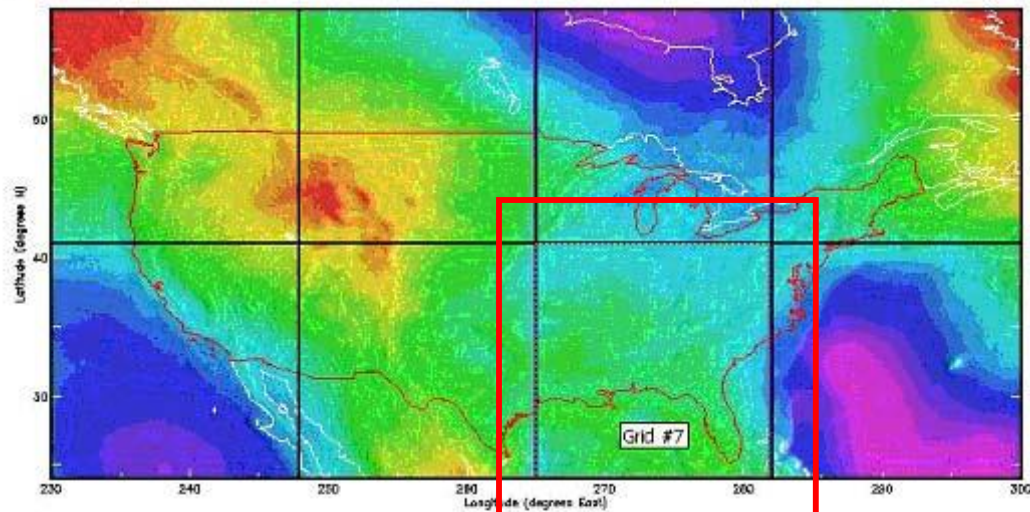
### Information

- [GEOID03 ReadMe file](#)

### Programs

- [FORTRAN source code INTG.FOR](#) (Version 1.3, Dec 24, 2003)
- [Unix \(Sun\)binary executable INTG](#) (Version 1.3, Dec 24, 2003)
- [PC Binary executable INTG.EXE](#) (Version 1.3, Dec 24, 2003)
  
- [FORTRAN source code XNTG.FOR](#) (Version 1.1, Dec 24, 2003)
- [Unix \(Sun\)binary executable XNTG](#) (Version 1.1, Dec 24, 2003)
- [PC Binary executable XNTG.EXE](#) (Version 1.1, Dec 24, 2003)

**Graphical Interface-** click on the desired image grid to download a binary file



### Data (non-graphical interface)

- Binary Grids (all are 1141 columns by 1081 rows and are 4 933 728 bytes in size)



NOAA Technical Memorandum NOS NGS-58

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GUIDELINES FOR ESTABLISHING GPS-DERIVED ELLIPSOID HEIGHTS  
(STANDARDS: 2 CM AND 5 CM)  
VERSION 4.3

David B. Silkoski  
Joseph D. D'Onofrio  
Stephen J. Frakes

Silver Spring, MD

November 1997  
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## NOAA Technical Memorandum NOS NGS 58



# DRAFT

## **Guidelines for Establishing GPS-Derived Orthometric Heights (Standards: 2 cm and 5 cm)**

**Version 1.4**

David B. Zilkoski  
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October 2005



