

Cove Road - Crib Wall

Monitoring Survey



Google earth

Data SIO, NOAA, U.S. Navy, NGA, GEBCO

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Data CSUMB SFML, CA OFC

Image Landsat / Copernicus

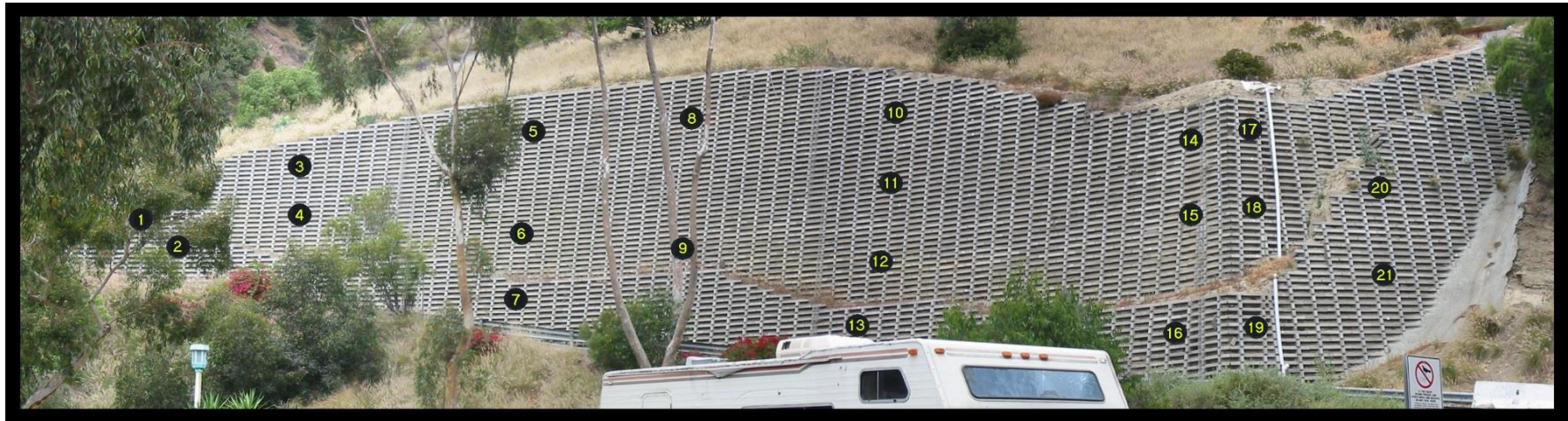
70 ft

Cove Road - Crib Wall Monitoring Survey

This crib-type retaining wall was built in 1985 after the top of the bluff located under Cannons Restaurant failed during heavy rains in the winter of 1980-1981.

Chart Details:

Each chart contains movement (change in northing, easting, elevation) from each survey relative to the 1997 base survey for each station. All data is shown in U.S. Survey Feet.



21 mini-prisms were set into the Crib Wall for monitoring targets July, 1997.

See following sheet for procedures and chart details.

Horizontal Datum = CCS83, Zone VI, OCS 1991.35 Adjustment
Vertical Datum = NAVD88, OCS 1995 Adjustment

Cove Road - Crib Wall Monitoring Survey

Survey Report Summary

Aug 1997: Initial survey performed.

Nov 1998: No significant movement found.

May 1999: No significant movement found.

May 2000: No significant movement found.

May 2001: No significant movement found.

July 2002: No significant movement found.

June 2004: No significant movement found.

June 2006: No significant movement found. Heights on all targets show an average change of -0.02' which is related to the recomputed height of control point "CRIB" and is not movement of the crib wall.

May 2008: No significant movement found.

June 2010: No significant movement found. The Leica TCA 1100 Total Station was serviced for calibration in March 2010.

June 2012: No significant movement found. Leica TCA had a card reading problem-gun not used. TPS 1203 (SN: 214338) was used.

Sep 2014: No significant movement found. Trimble S8 was used for this survey. Survey delayed due to trimming trees.

Dec 2016: Targets located along the top of the Crib wall have shown slight downslope horizontal movement in the last two surveys with the largest amount being targets 14 and 17 located at the top corner of the wall. Survey delayed due to trimming trees.

Aug 2017: (Post-Construction) Survey was performed to monitor the wall during the Erosion Repair and Drain Modification project. Targets 17, 19, 20, and 21 show questionable movement.

Sept 2018: Same slight downslope movement as seen in 2016 continues. Control level network differed by 0.09' from previous surveys. This MUST be watched closely in future surveys.

Sept 2020: Same slight downslope movement as seen in 2018 continues. Target 17 was replaced sometime after the 2018 monitor. Survey delayed due to tree trimming. Control level network differed by 0.08' from previous surveys. This MUST be watched closely in future surveys.

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Monitoring Procedures:

All surveys are performed following the steps listed below:

STEP # 1

Utilizing GPS Static survey techniques, measure stations "CRBX", "A" and "D" to two OCS CGPS Horizontal control stations SBCC & TRAK which are located outside of the project area. GPS data is post-processed and a minimally constrained adjustment is done constraining the same control station (SBCC) each survey if possible. Positions are compared to the 1997 survey. This data is used to check the stability, horizontally and vertically, of the three monitoring stations. Positions for stations "B", "C", and "BH3" are verified from the GPS stations using conventional techniques.

STEP # 2

Utilizing Precise leveling techniques following 2nd Order - Class II specifications, measure the vertical differences between all monitoring stations relative to four OCS Vertical control stations. This data is used to monitor any subsidence and/or uplift on the monitoring stations.

STEP # 3

Utilize conventional surveying techniques with a Total Station. Measure each target 4 times (2 direct, 2 reverse).

All 5 control stations observe all possible targets to achieve sufficient redundancy. The observations are then entered into a StarNet least-squares adjustment for calculation of final positions.

Comments:

Each survey is done using the same techniques with the same survey equipment if possible. A "Report Summary" is given on the first sheet and contains a short comment on each survey. Detailed information pertaining to monument descriptions and survey information are not included in this report, but can be obtained at OC Survey Divison, Geodetic Control Unit.

Cove Road - Crib Wall Monitoring Survey

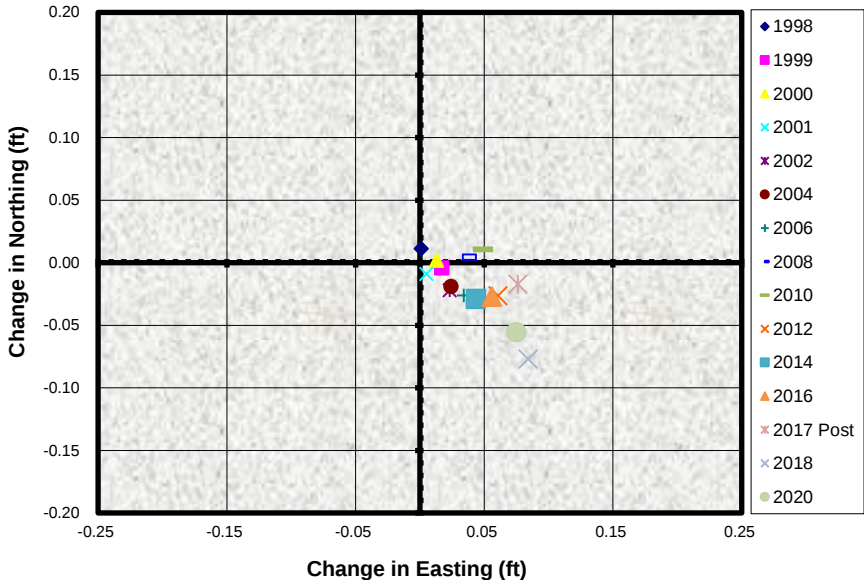
Instrument History

1997-2010	Leica TCA 11100
2012	Leica TCA 1203
2014	Trimble S8
2016	Trimble S8
2018	Trimble S7
2020	Trimble S7

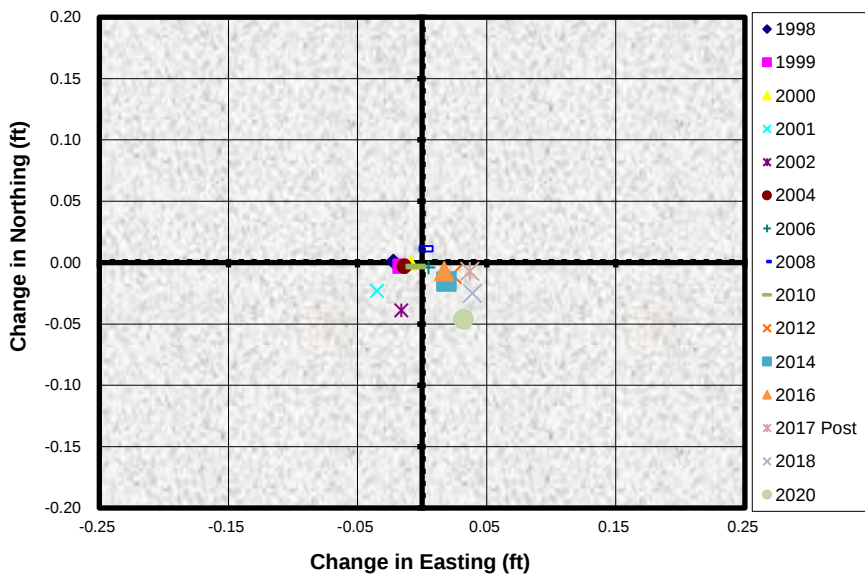
See Word Doc "Instrument and Prism Information" on prism offset settings.

Cove Road Crib Wall
Movement from 1997 Initial Survey

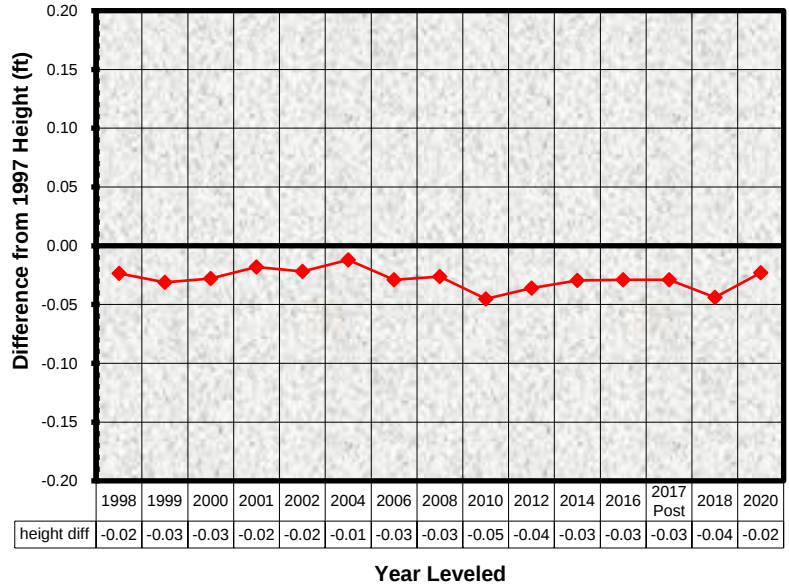
Station # 1 - Horizontal



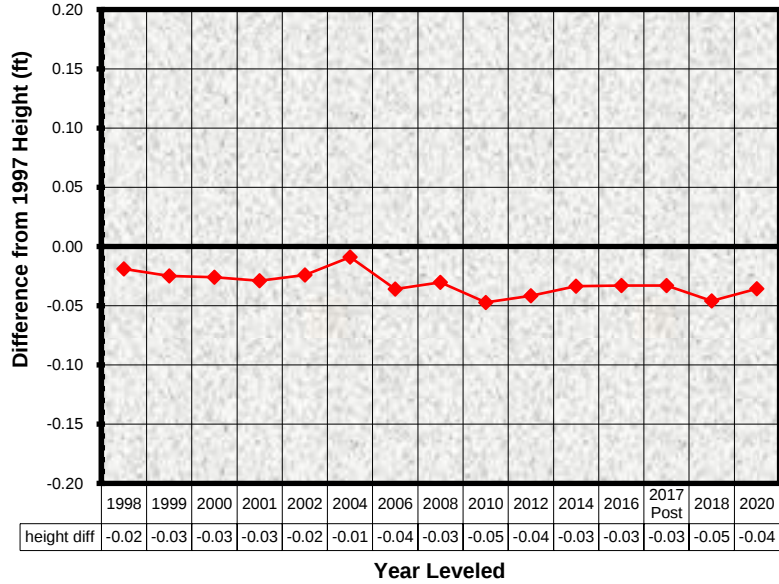
Station # 2 - Horizontal



Station # 1 - Vertical

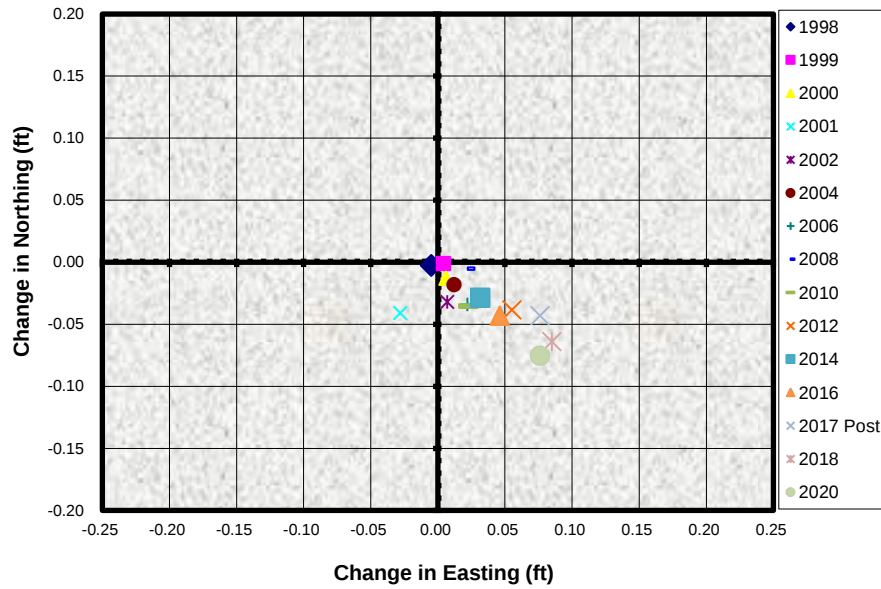


Station # 2 - Vertical

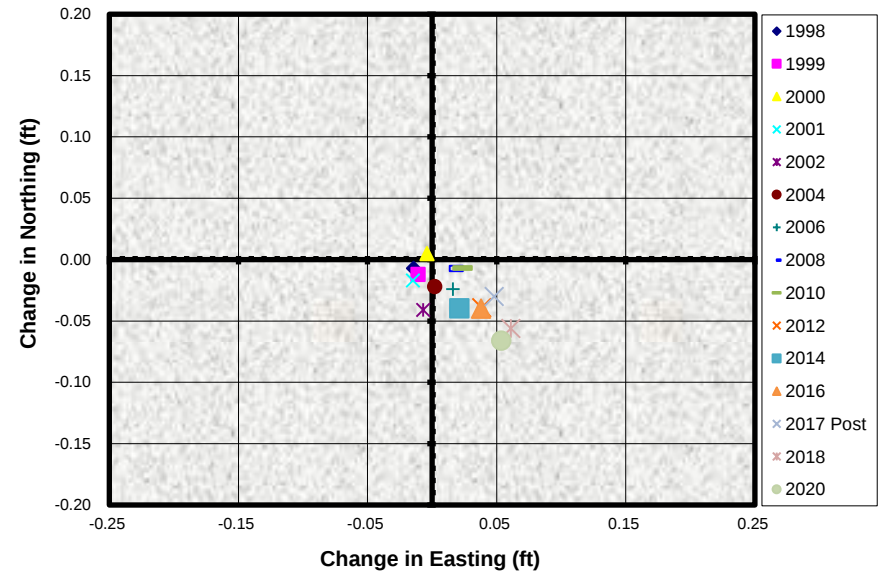


Cove Road Crib Wall Movement from 1997 Initial Survey

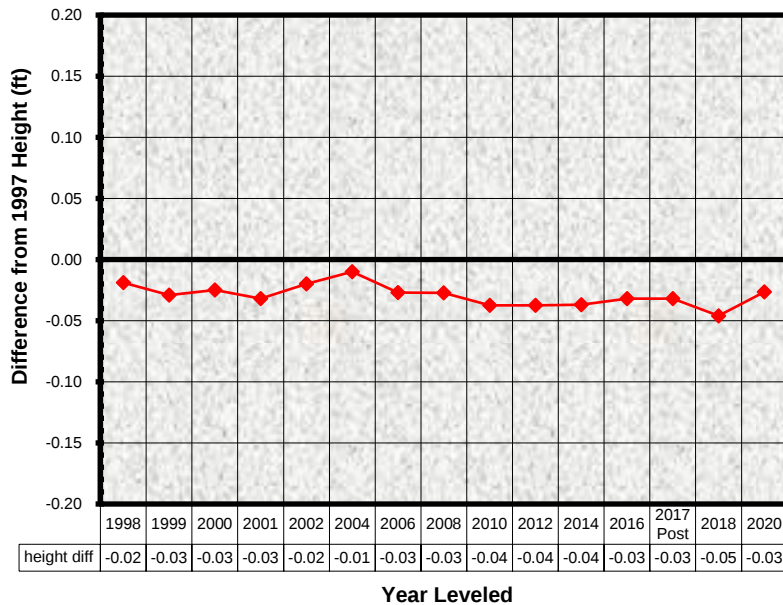
Station # 3 - Horizontal



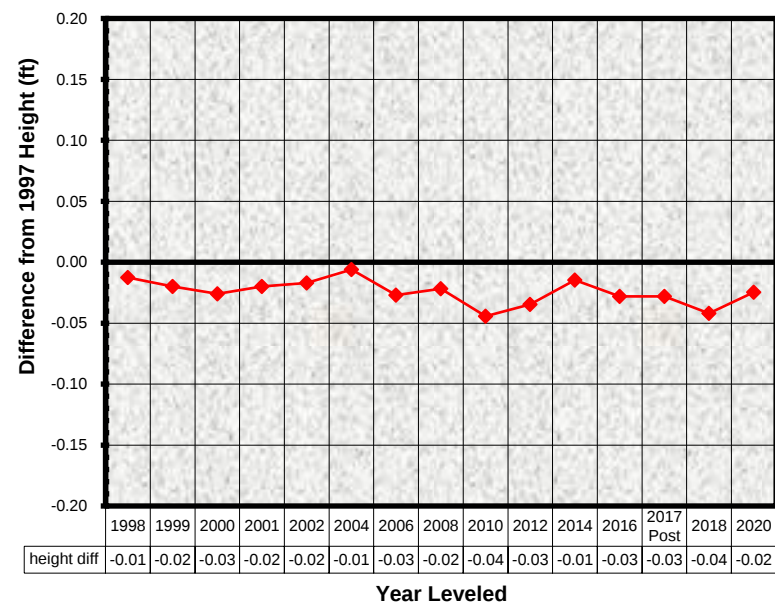
Station # 4 - Horizontal



Station # 3 - Vertical

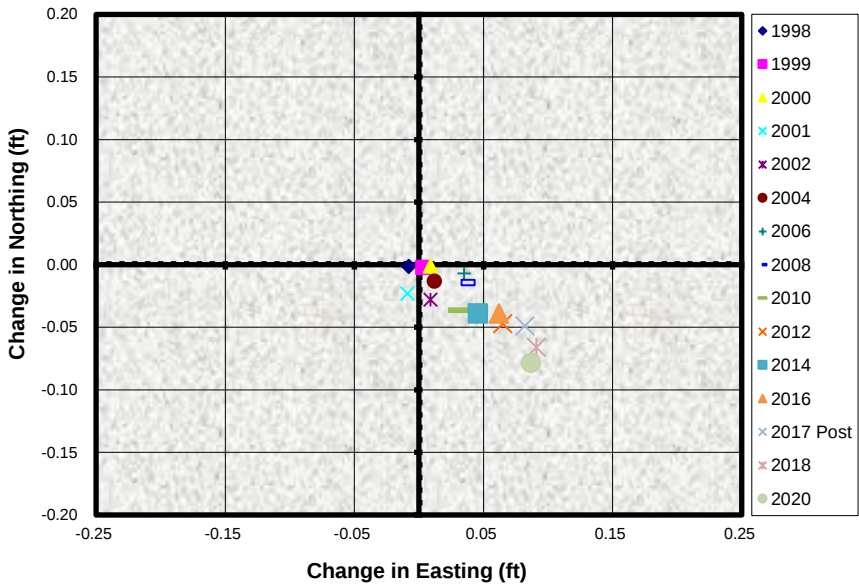


Station # 4 - Vertical

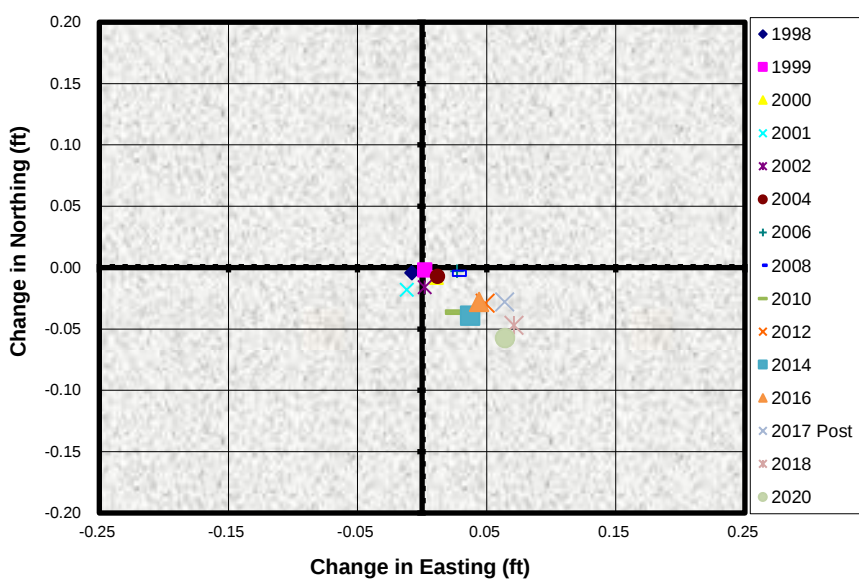


Cove Road Crib Wall
Movement from 1997 Initial Survey

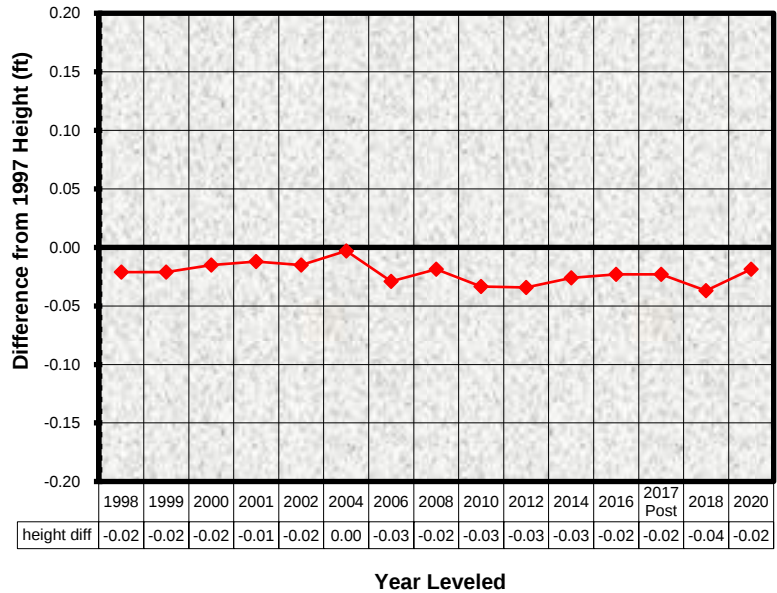
Station # 5 - Horizontal



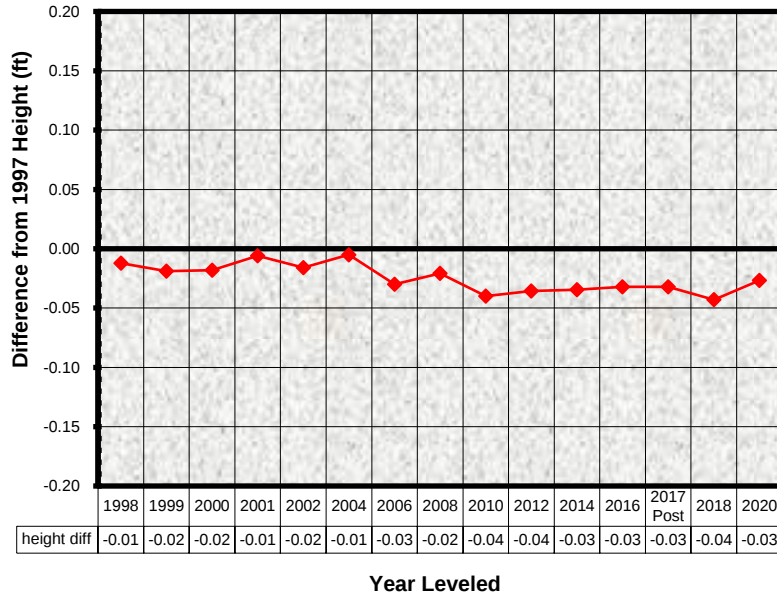
Station # 6 - Horizontal



Station # 5 - Vertical

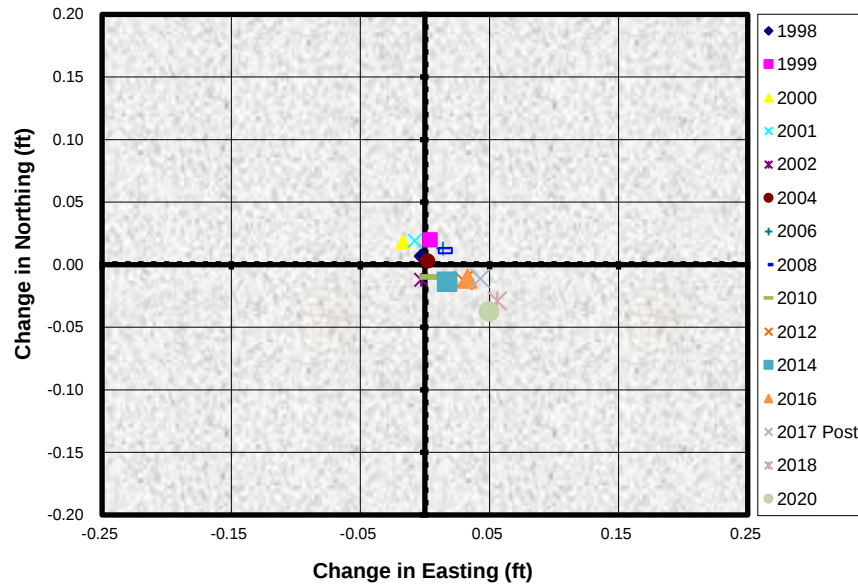


Station # 6 - Vertical

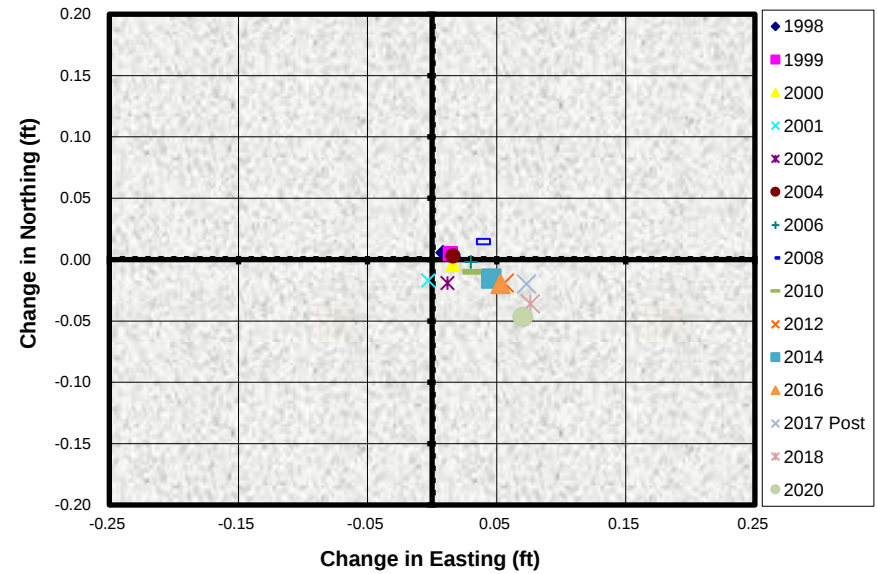


Cove Road Crib Wall Movement from 1997 Initial Survey

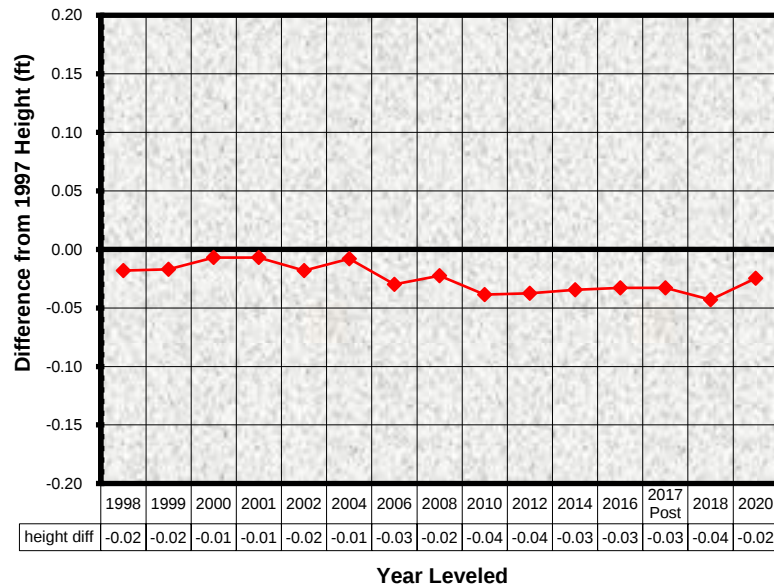
Station # 7 - Horizontal



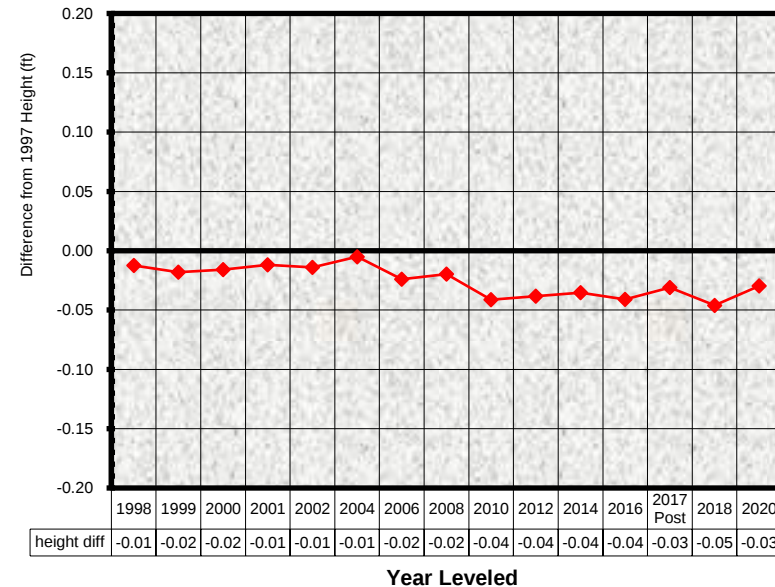
Station # 8 - Horizontal



Station # 7 - Vertical

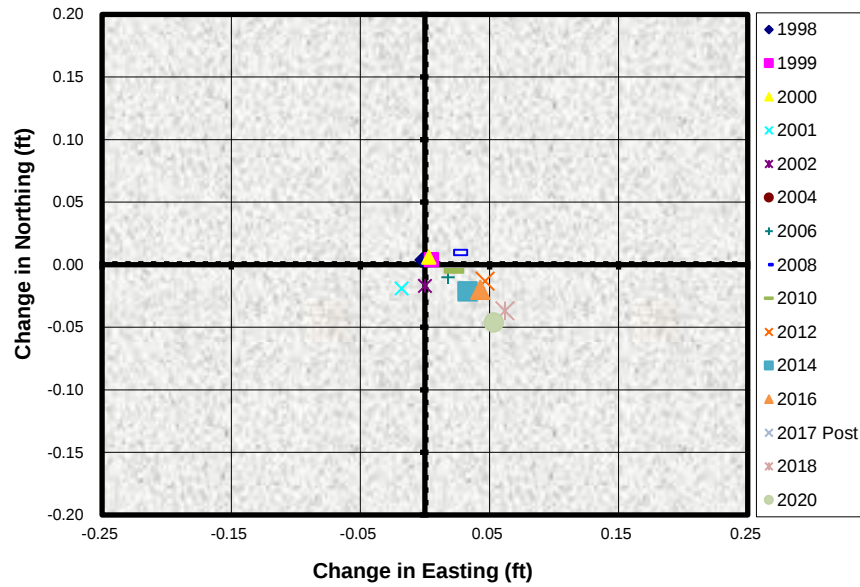


Station # 8 - Vertical

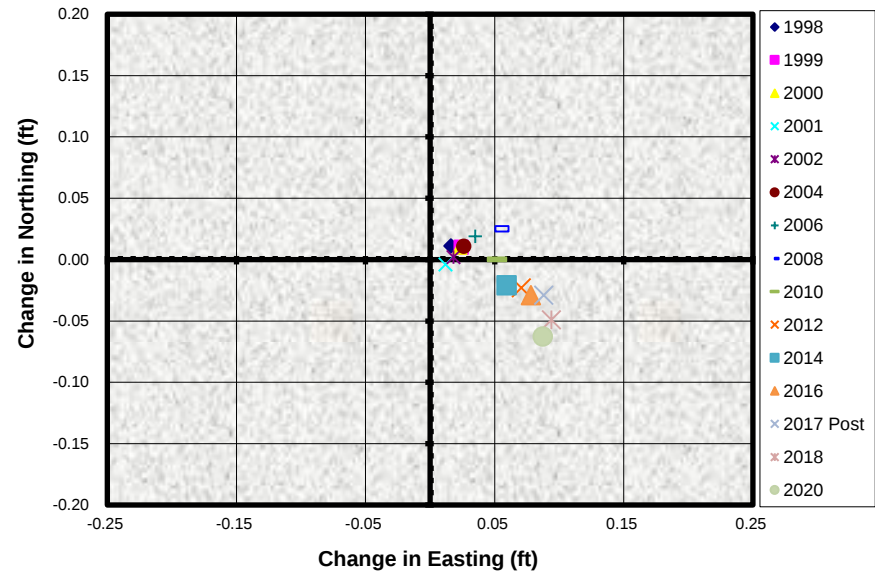


Cove Road Crib Wall Movement from 1997 Initial Survey

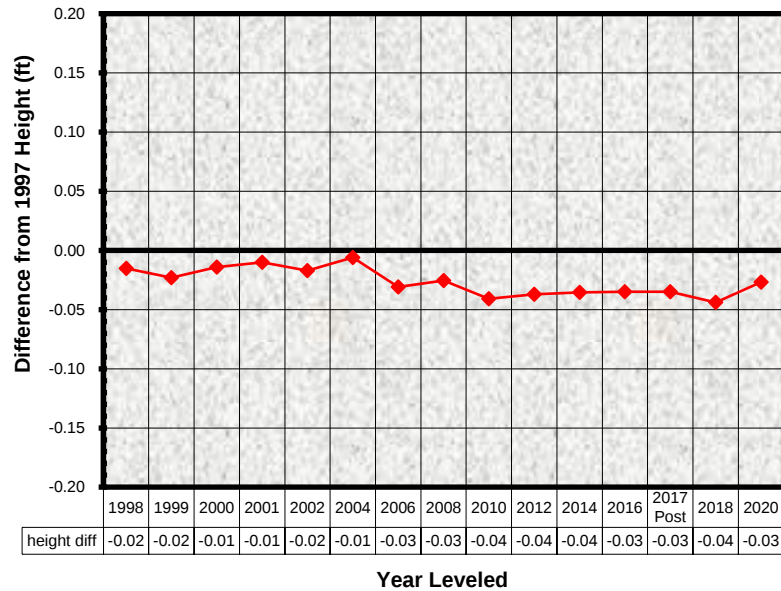
Station # 9 - Horizontal



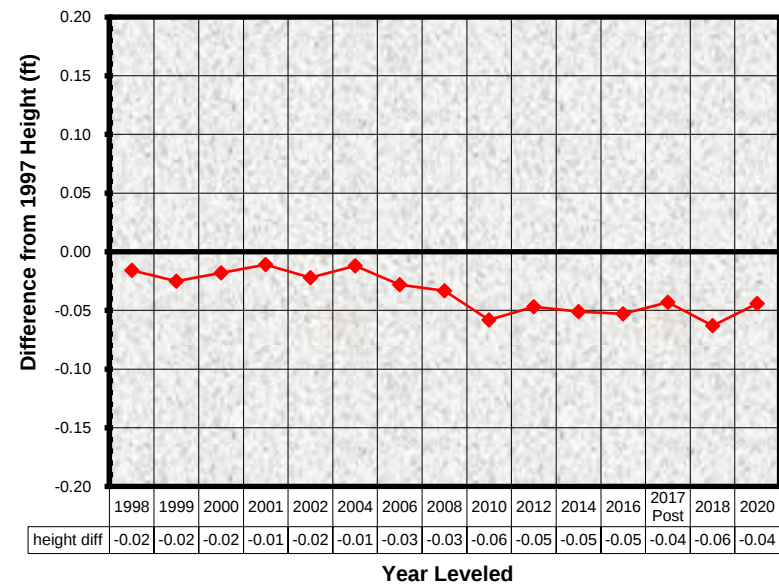
Station # 10 - Horizontal



Station # 9 - Vertical

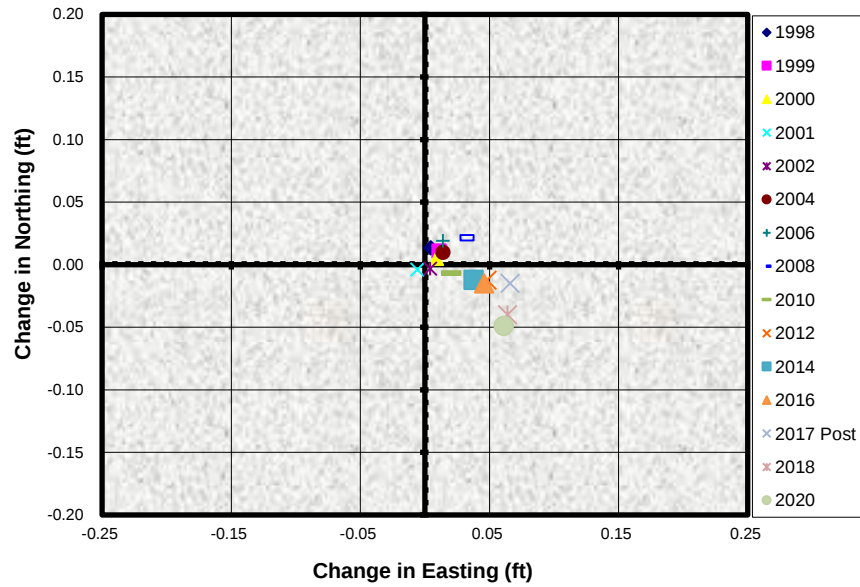


Station # 10 - Vertical

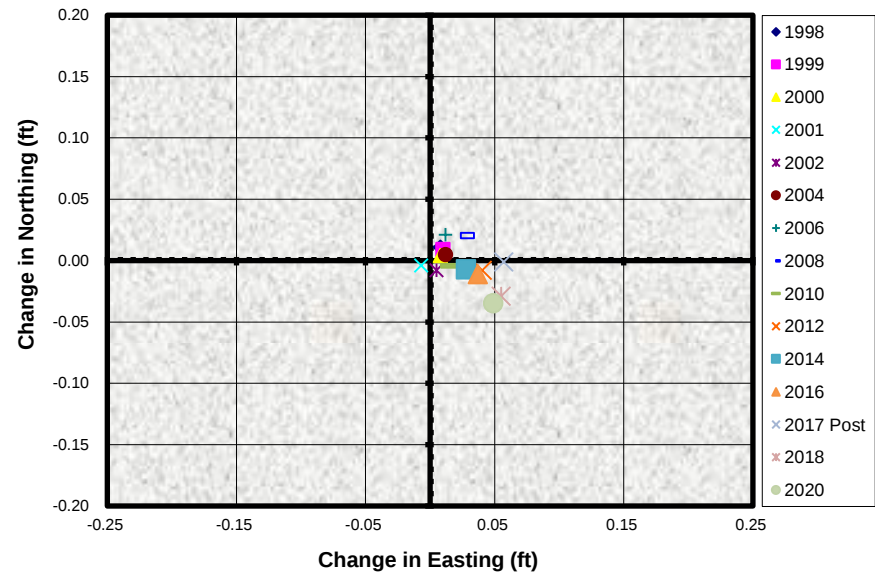


Cove Road Crib Wall Movement from 1997 Initial Survey

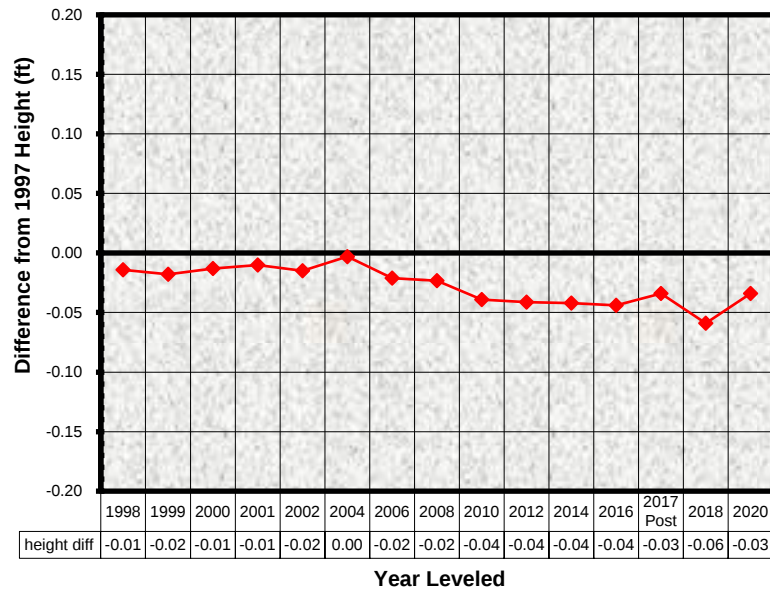
Station # 11 - Horizontal



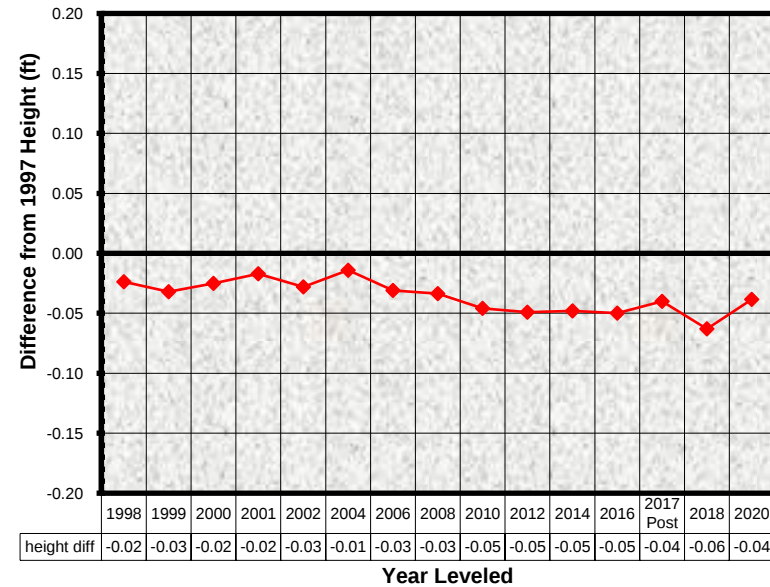
Station # 12 - Horizontal



Station # 11 - Vertical

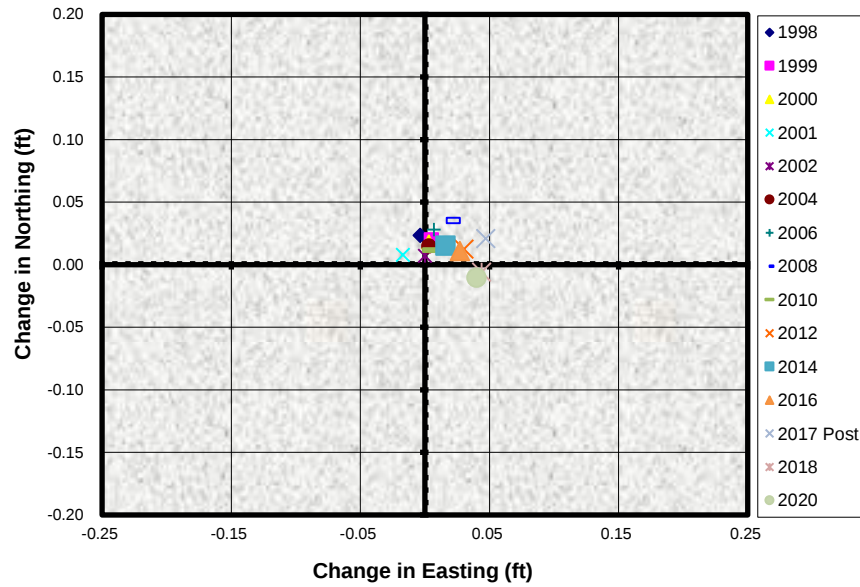


Station # 12 - Vertical

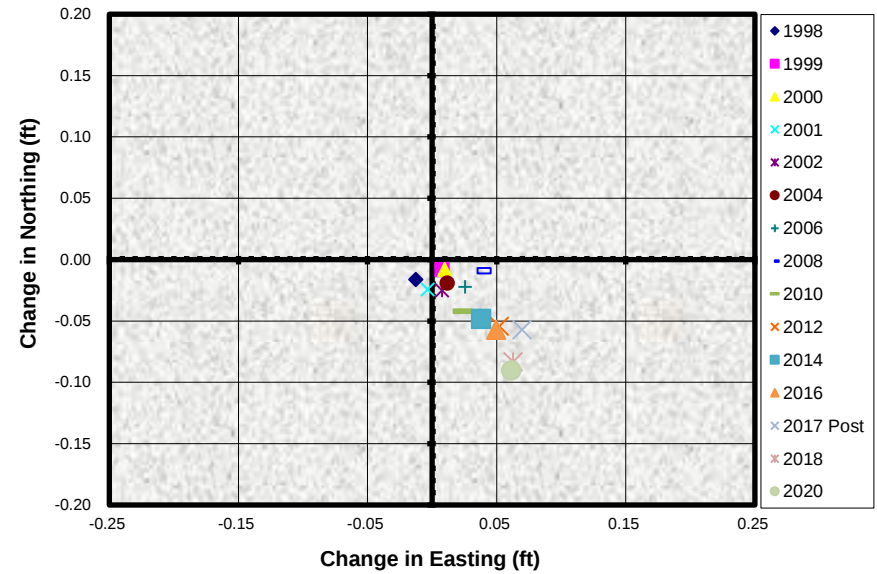


Cove Road Crib Wall Movement from 1997 Initial Survey

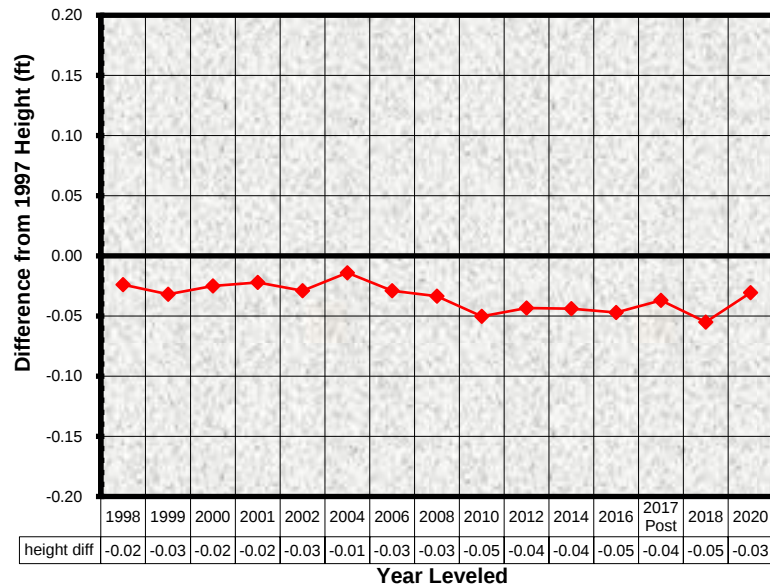
Station # 13 - Horizontal



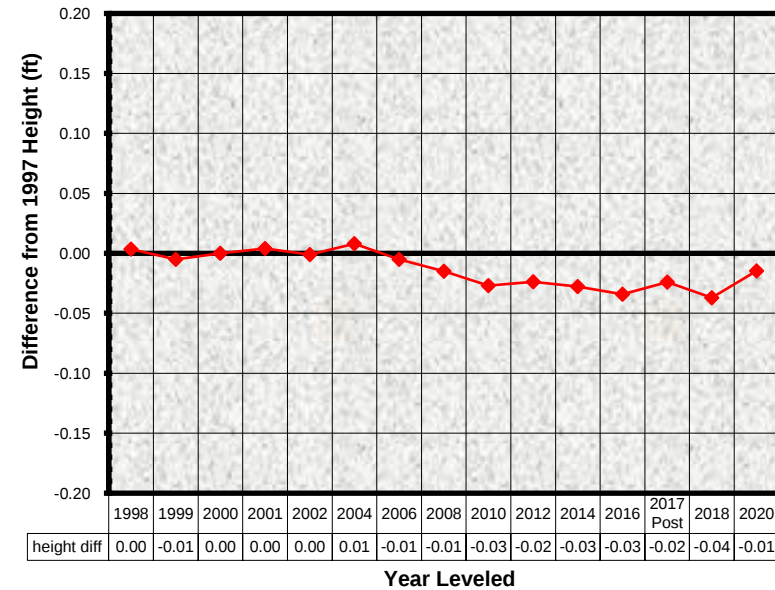
Station # 14 - Horizontal



Station # 13 - Vertical

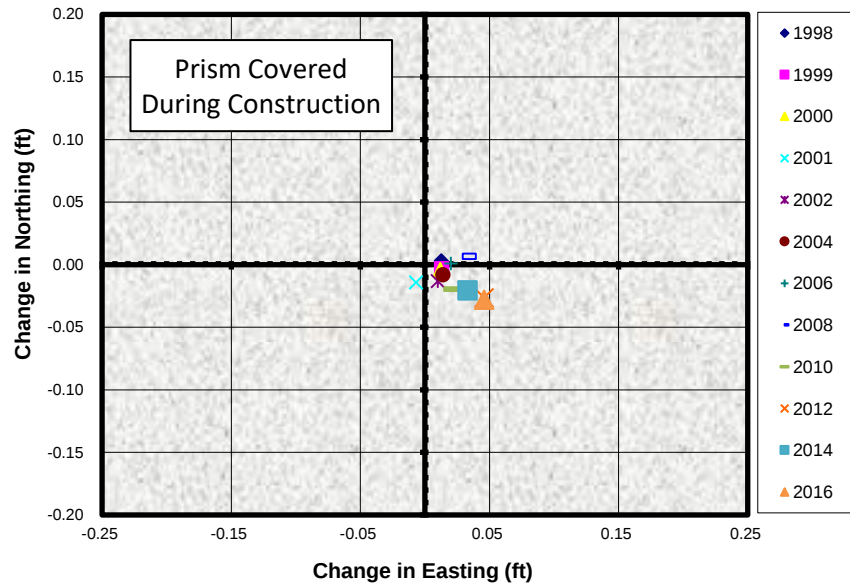


Station # 14 - Vertical

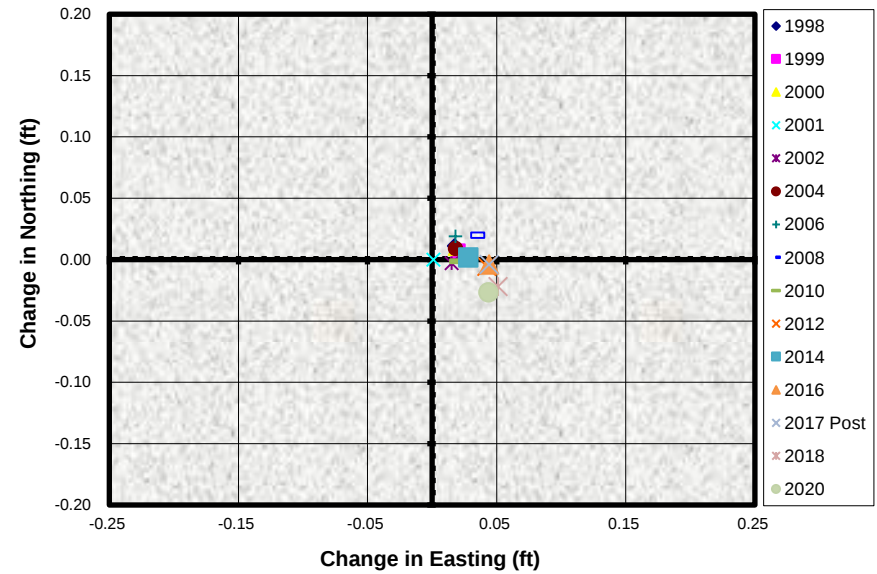


Cove Road Crib Wall Movement from 1997 Initial Survey

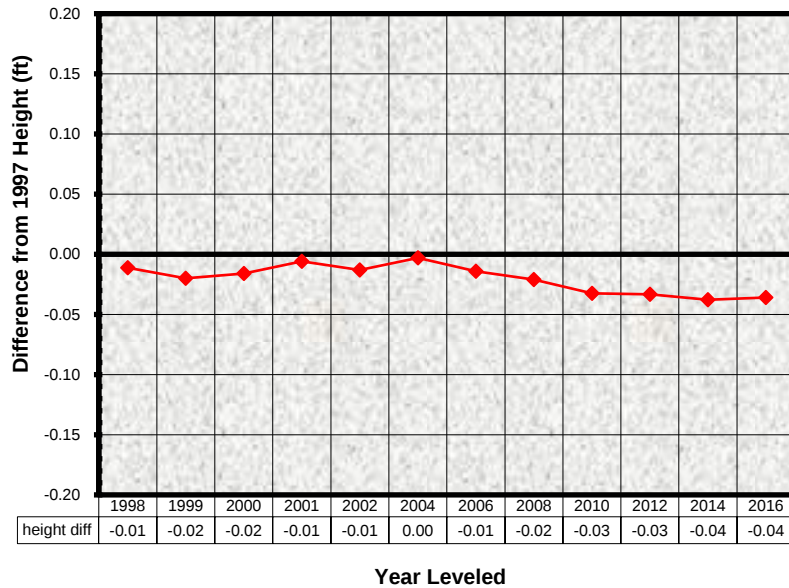
Station # 15 - Horizontal



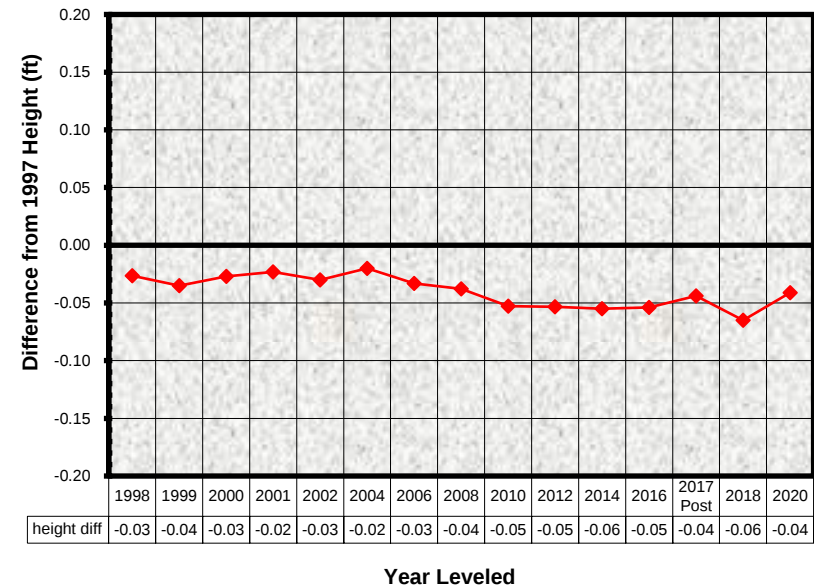
Station # 16 - Horizontal



Station # 15 - Vertical

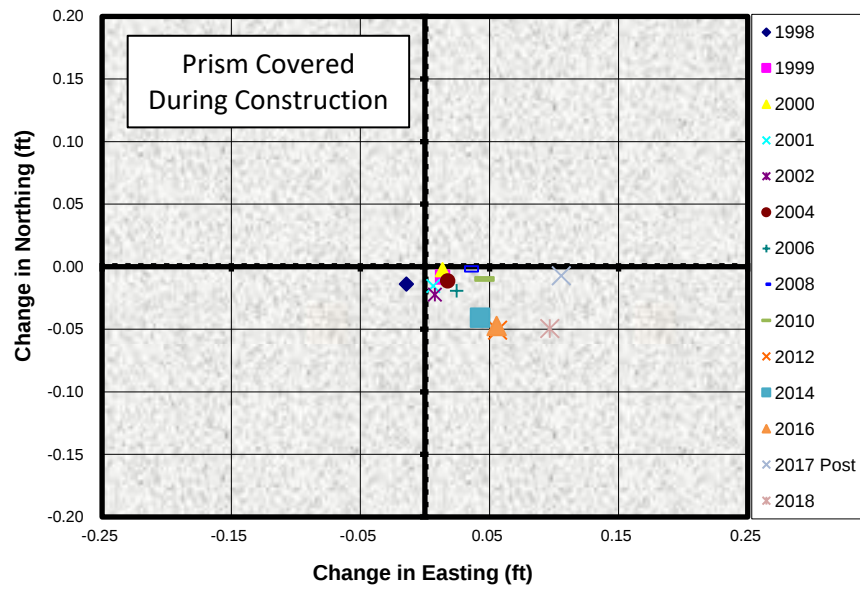


Station # 16 - Vertical

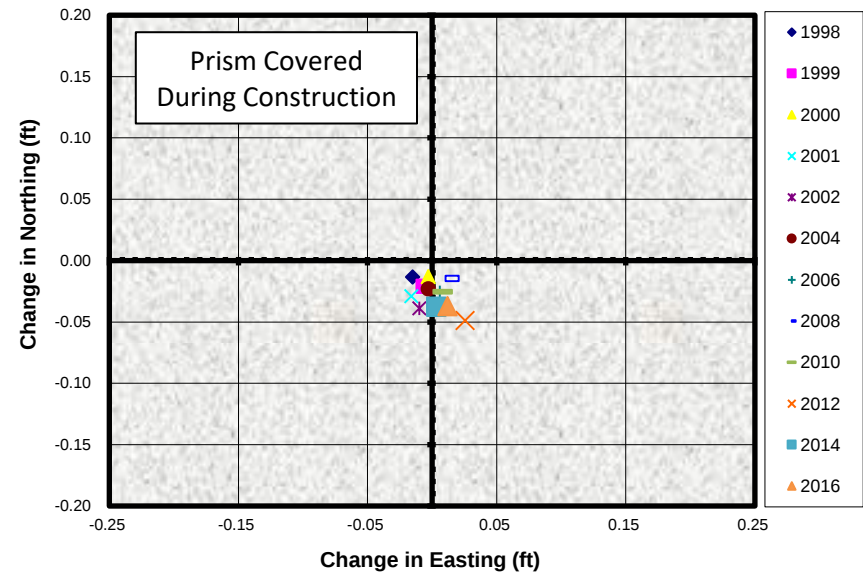


Cove Road Crib Wall Movement from 1997 Initial Survey

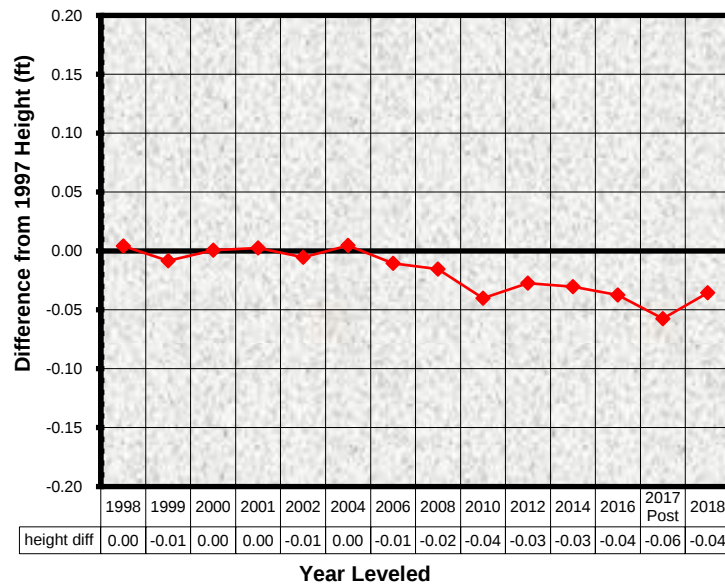
Station # 17 - Horizontal



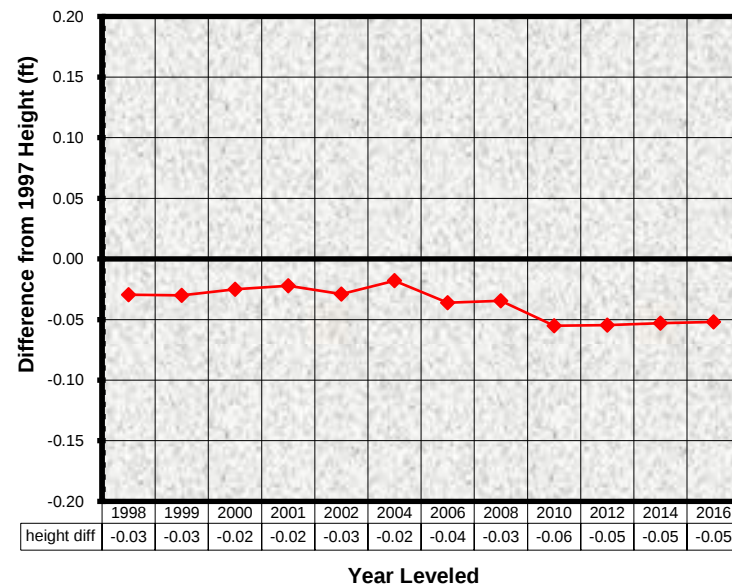
Station # 18 - Horizontal



Station # 17 - Vertical

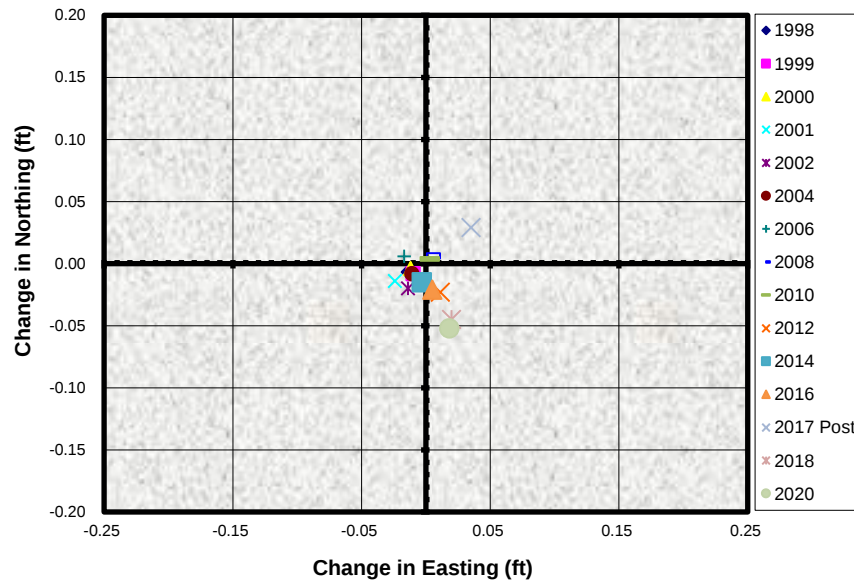


Station # 18 - Vertical

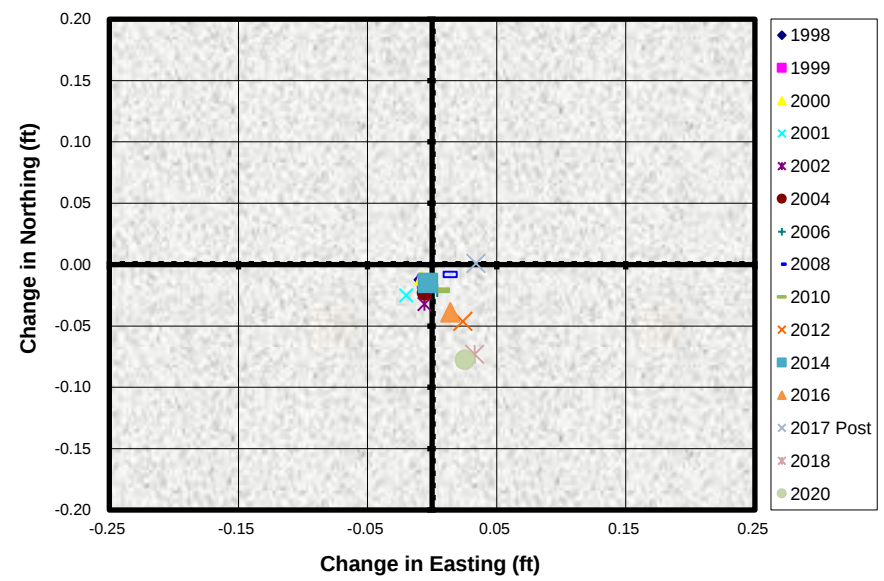


Cove Road Crib Wall Movement from 1997 Initial Survey

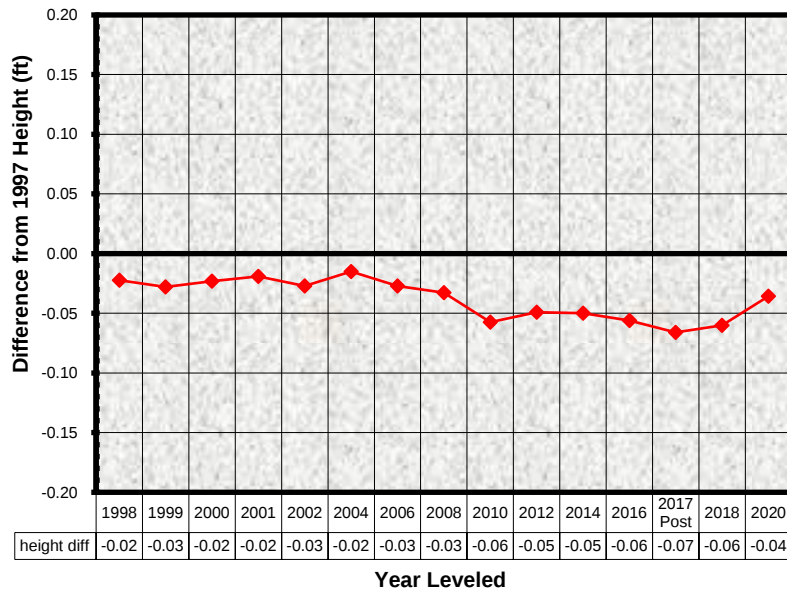
Station # 19 - Horizontal



Station # 20 - Horizontal



Station # 19 - Vertical



Station # 20 - Vertical

