



Navigating Datum Conversions for NFIP Flood Insurance



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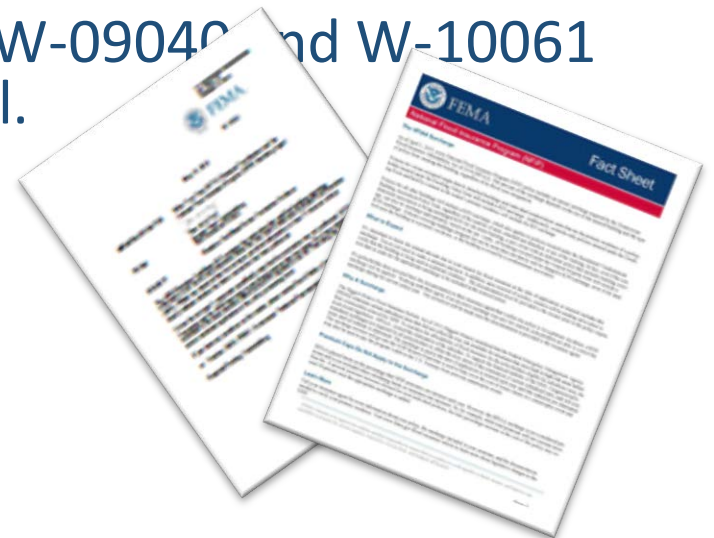
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Risk Management Directorate
9/22/2016

The Rules

- The Homeowners' Flood Insurance Affordability Act (HFIAA), Section 28, Clear Communications
- New re-underwriting procedures for Write-Your-Own (WYO) carriers and the NFIP Direct Servicing Agent
 - In March 2016, FEMA issued a fourth addendum requiring insurers to report all elevation data with the same datum as the current Base Flood Elevation (BFE).
 - Became effective April 1, 2016.
- Guidance provided in WYO Bulletins W-09040 and W-10061 and the NFIP Flood Insurance Manual.



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The Basics

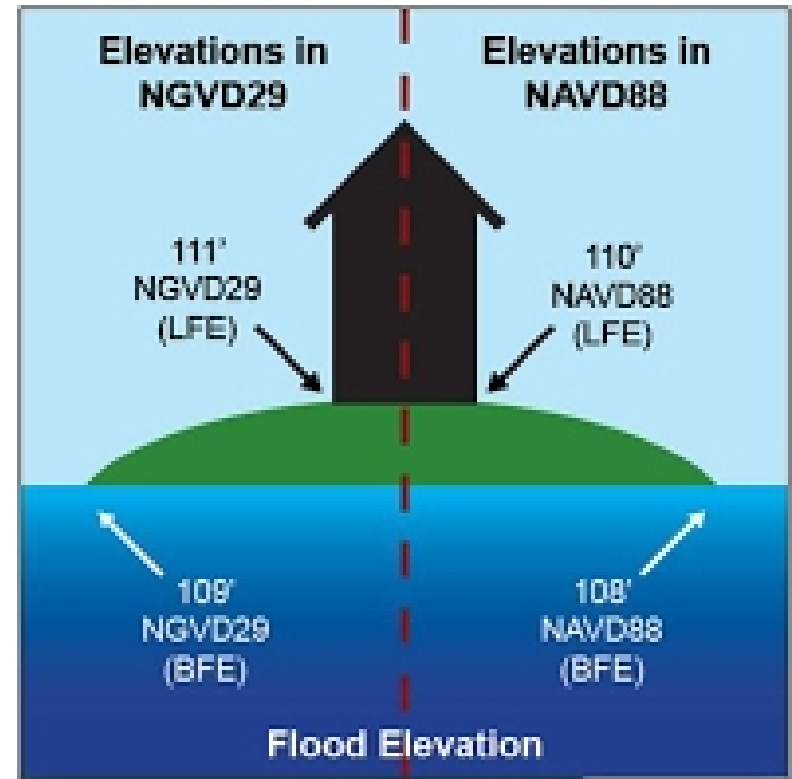
- What is datum?
- What is a benchmark?
- Why did the datum change?
- What are the different datums you will likely see?
 - NVGD 29 - National Geodetic Vertical Datum of 1929
 - NAVD 88 - North American Vertical Datum of 1988
 - Other datums (MSL – Mean Sea Level, City Datums, Island Datums)
- Who's the keeper of the datums?



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Datum Conversion Example

Datum conversions should not affect the relationship of building elevations to BFEs or to the ground elevation unless these other elevations have been updated in addition to the datum conversion.



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When to Convert Datum for Rating

- Confirm what datum the building elevations currently used for rating are referenced to
 - They should be indicated on the EC
- Confirm what datum the BFE on the current effective map is reference to
 - This is listed in the legend of the FIRM panel
- If the datums are not the same, a conversion is needed

A FEMA Elevation Certificate (EC) form, Form 0100-001, is shown at an angle. The form is titled "ELEVATION CERTIFICATE" and includes sections for "BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)", "SURVEYOR INFORMATION", and "CERTIFICATION". It contains various fields for property information, survey details, and a checklist for measurement units (feet or meters).

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Converting Datum

- When the FIRM for a location is converted from an older vertical datum to new datum, the conversion factor used is documented in the Flood Insurance Study (FIS)
- Using the conversion factor from the FIS is the preferred method to avoid creating artificial impacts from the conversion due to rounding issues



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3.4 Vertical Datum

All FISs and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum in use for newly created or revised FISs and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD 29). With the finalization of the North American Vertical Datum of 1988 (NAVD 88), many FIS reports and FIRMs are being prepared using NAVD 88 as the referenced vertical datum.

All flood elevations shown in this FIS report and on the FIRM are referenced to NAVD 88. Structure and ground elevations in the community must, therefore, be referenced to NAVD 88. It is important to note that adjacent communities may be referenced to NGVD 29. This may result in differences in base flood elevations across the corporate limits between the communities.

As noted above, the elevations shown in the FIS report and on the FIRM for Monterey County are referenced to NAVD 88. Ground, structure, and flood elevations may be compared and/or referenced to NGVD 29 by applying a standard conversion factor.

The conversion from NGVD 29 to NAVD 88 ranged between 2.70 and 3.14 for this community. Accordingly, due to the statistically significant range in conversion factors, an average conversion factor could not be established for the entire community. The elevations shown in the FIS report and on the FIRM were, therefore, converted to NAVD 88 using a stream-by-stream approach. In this method, an average conversion was established for each flooding source and applied accordingly. For the Salinas River, elevations were converted to NAVD 88 on a reach-by-reach basis, applying different factors for the Salinas River near King City and the Salinas River near San Ardo. The conversion factor(s) for each flooding source in the community may be found in the following Table 12, "Vertical Datum Conversion."

The BFEs shown on the FIRM represent whole-foot rounded values. For example, a BFE of 102.4 will appear as 102 on the FIRM and 102.6 will appear as 103. Therefore, users that wish to convert the elevations in this FIS to NGVD 29 should apply the stated conversion factor(s) to elevations shown on the Flood Profiles and supporting data tables in the FIS report, which are shown at a minimum to the nearest 0.1 foot.

For more information on NAVD 88, see Converting the National Flood Insurance Program to the North American Vertical Datum of 1988, FEMA Publication FIA-20/June 1992, or contact the Spatial Reference System Division, National Geodetic Survey, NOAA, Silver Spring Metro Center, 1315 East-West Highway, Silver Spring, Maryland 20910. Internet address <http://www.ngs.noaa.gov>.



For a single conversion value, the text will look like this:

3.3 Vertical Datum

All FIS reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground and structure elevations can be referenced and compared. Until recently, the standard vertical datum in use for newly created or revised FIS reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD29). With the finalization of the North American Vertical Datum of 1988 (NAVD88), many FIS reports and FIRMs are being prepared using NAVD88 as the referenced vertical datum.

Effective information for this countywide FIS report was converted from NGVD29 to NAVD88 based on data presented in TABLE 8. The average conversion of -0.609 foot was applied to convert all effective Base Flood Elevations (BFEs). Structure and ground elevations in the community must, therefore, be referenced to NAVD88. It is important to note that adjacent communities in other counties not presented in this countywide FIS may be referenced to NGVD29. This may result in differences in BFEs across the corporate limits between communities.



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For multiple conversion values, the text will look like this:

The conversion from NGVD 29 to NAVD 88 ranged between 2.70 and 3.14 for this community. Accordingly, due to the statistically significant range in conversion factors, an average conversion factor could not be established for the entire community. The elevations shown in the FIS report and on the FIRM were, therefore, converted to NAVD 88 using a stream-by-stream approach. In this method, an average conversion was established for each flooding source and applied accordingly. For the Salinas River, elevations were converted to NAVD 88 on a reach-by-reach basis, applying different factors for the Salinas River near King City and the Salinas River near San Ardo. The conversion factor(s) for each flooding source in the community may be found in the following Table 12, "Vertical Datum Conversion."

TABLE 12 - VERTICAL DATUM CONVERSION

STREAM	CONVERSION FACTOR (ft)
Arroyo Seco	2.99
Calera Creek	2.91
Canyon Del Rey (a.k.a. Arroyo Del Rey)	2.80
Carmel River	2.82
Carmel River South Highway 1 Overbank	2.75
Carmel River North Highway 1 Overbank	2.75
Carmel River Hacienda	2.77
Carmel River Schutte Overbank	2.82
Carmel River Garland Ranch	2.86
Castroville Boulevard Wash	2.74
Corncob Canyon Creek (to include Overflow)	2.72
East Branch Gonzales Slough	3.01
El Toro Creek	2.89
Elkhorn Slough	2.74
Gabilan Creek	2.75
Gonzales Slough	3.01
Harper Creek	2.93
Josselyn Canyon Creek	2.74
Natividad Creek	2.75
Pajaro River	2.71





National Geodetic Survey

Positioning America for the Future

Converting Datum

- NGS' VERTCON (software program)
 - Lowest Floor Guide, NFIP Flood Insurance Manual
 - Access the tool from:
http://www.ngs.noaa.gov/cgi-bin/VERTCON/vert_con.prl



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Example – Converting from NGVD 29 to NAVD 88

Using property location – latitude 35° 15' and longitude of 121° 22' 30"

- Building elevation is 54.2 ft
- Enter the elevation to be converted in NGVD 29 (e.g., top of bottom floor, top of next-higher floor, bottom of lowest horizontal structural member, or lowest adjacent grade next to the building).
- If the elevation is measured in feet (most places other than Puerto Rico), be sure to include “ft” after the elevation so that the results will be in feet.
- Result – A conversion factor of 2.726 feet and a building elevation of 56.926 feet NAVD 88. Shown in tenths of a foot, the building elevation is 56.9 feet NAVD 88.



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Example – Same property location Converting from NAVD 88 to NGVD 29

- Building elevation is 54.2 ft NAVD 88
- Enter data as in previous example.
- Be sure to select Vertical Datum NAVD 88, then click on Submit.

Result – Conversion factor of 2.726 feet.

Use the building elevation of 54.2 feet. The building elevation in NGVD 29 is 51.474 feet. Shown in tenths of a foot, the building elevation is 51.4 feet NGVD 29.



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What if the datum for the existing EC is not clear?

- Insurance professionals can assume that the elevations provided on the EC are referenced to the same vertical datum as the BFE shown on the EC unless it is clear from the EC that they are not.
- The datum for the BFE should be shown on the FIRM panel referenced on the EC.



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When to Require a New EC

- The conversion information is not in the FIS, and
- VERTCON cannot be used because the location is outside of CONUS or the datum conversion is not between NGVD 29 and NAVD 88

Or

- It is clear that the information provided on the existing EC is incorrect



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Submitted Questions

- Is VERTCON the only tool available to use for conversions?
- How do I properly enter longitude and latitude numbers in VERTCON for the states of Alaska and Hawaii?
- If I receive a new elevation certificate where the surveyor has included a value for the datum shift, do I need to convert the building elevations provided ?
- How do I convert datum other than NGVD 29 and NAVD 88, like MSL and Cairo (a very old datum)?



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Questions, continued

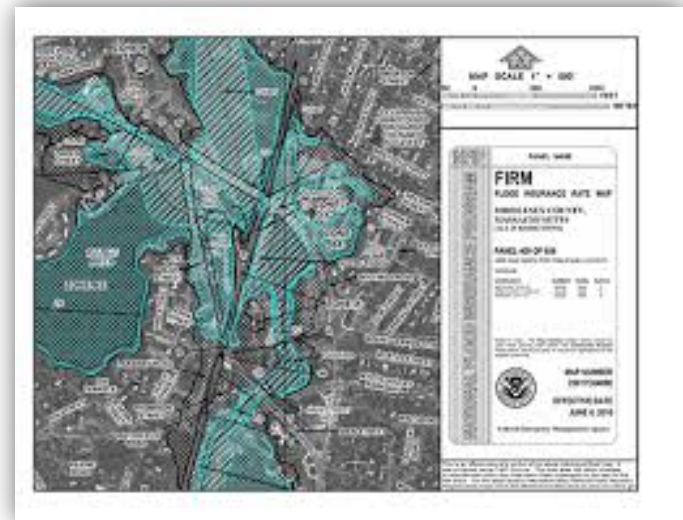
- What should I do if the new EC does not provide the surveyed elevation data in the correct datum?
- Does the conversion process differ if the BFE changes dramatically (i.e. old BFE -1 NGVD 29, new BFE 16 NAVD 88) or does the standard process apply?
- What is the result when, after a FIRM change, the BFEs are the same but the datum differs (i.e. the current BFE is 8' NAVD 88 and the prior BFE was 8' NGVD 29)?
- If I have an older elevation certificate, where the surveyor included a datum conversion on the elevation certificate between current BFE datum and the datum for the final elevations on the old elevation certificate, can I use the surveyor's conversion factor to convert back to the current BFE datum?



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And the big one

- When will all FIRMs reflect the NAVD 88 datum?



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In Summary ... What You Need to Remember

- Re-underwriting rules require that all elevation data be reported with the same datum as the current BFE
- Elevations are measured from reference points throughout the United States
- Surveyors are responsible for making the conversions when completing a new EC
- When an existing EC does not reflect the needed datum, the insurance professional, in less complicated situations, will have to make the conversion



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Summary, continued

- There are times when a new EC will be required
- Tools are available for making datum conversions
- If an old EC is ambiguous about the datum, but is not clearly wrong, the company should assume it is referenced to the same datum as the BFE on the EC. The datum for the BFE should be shown on the FIRM panel referenced
- Companies are required to document their files, but FEMA will not add any specific reporting requirement around elevation certificates and datums as part of this process



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Summary, continued

- If the company determines that the policy is currently mis-rated during the review, normal processes for correcting the rating apply
- A new EC is only required if the old EC is clearly incorrect, or if no conversion factor can be determined between the EC datum and the current effective BFE datum
- Using the FIS is the preferred method for determining the datum conversion. VERTCON is the best alternative. Companies may use other credible methods if neither of those 2 options is available, such as consultation with a community official, referenced to published conversion factors for local datums, or consultation with a surveyor
- If an existing EC already shows the conversion factor needed, that conversion factor may be used



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