

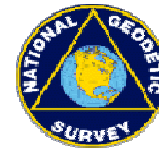
Readjustment of the National Spatial Reference System

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Ohio Geodetic Advisor

GIS-T Symposium
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Columbus OH



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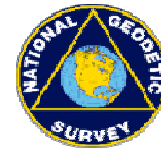
Positioning America for the Future

National Readjustment

- **What?**
- **Why**
- **How**
- **When**



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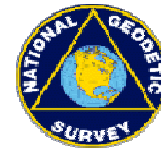
NATIONAL SPATIAL REFERENCE SYSTEM

**NSRS is comprised of all geodetic control contained
in the National Geodetic Survey's Database**

- **Horizontal and Vertical Control Points**
- **Geoid models**
- **Gravity data**
- **Precise GPS orbits**
- **GPS Continuously Operating Reference Stations (CORS)**
- **<http://www.ngs.noaa.gov/>**



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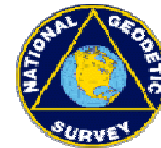
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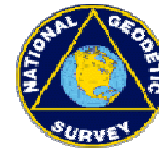
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IMPROVING ACCURACY

<u>Network</u>	<u>Time Period</u>	<u>Network Accuracy</u>	<u>Local Accuracy</u>
NAD27	1927 - 1986	10 meters	1:100,000
NAD83 (86)	1986 - 1990	1 meter	1:100,000
HARN	1990 - 1997	0.1 meter	1:1,000,000
CORS	1996 -	0.01 meter	0.01 meter
NAD83 (NSRS)	2007 -		



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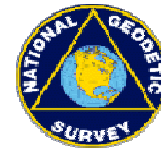
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Reasons for Readjustment

- Increasing accuracy not reflected in coordinates
- Multiple epoch dates
- Eliminate inconsistencies between state HARN's
- Achieve consistency with CORS
- Provide network and local accuracies



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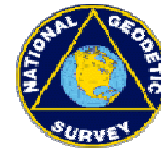
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NAD83 (NSRS) Adjustment Team

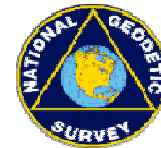


The National Readjustment

- Only GPS projects will be adjusted
- CORS will provide the control
- FBN/CBN surveys are a key element, providing high accuracy (2 cm) ties between HARN and CORS as well as more accurate ellipsoid heights throughout the U.S.



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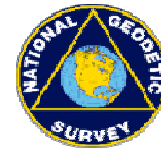
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Local Accuracy

- A value that represents the uncertainty of coordinates relative to other directly connected adjacent points at the 95% confidence level
- Average of the individual local accuracy values between this control point and other observed control points used to establish it



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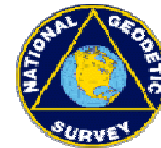
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Network Accuracy

- A value that represents the uncertainty of coordinates with respect to the geodetic datum at the 95% confidence level
- Local and network accuracy of CORS are considered to be infinitesimal, approaching zero



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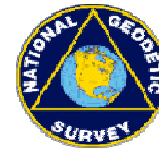
New Standards for Geodetic Control

- Local accuracy ----- Adjacent Points
- Network Accuracy ----- Relative to CORS
- Numeric quantities with units in cm or mm
- Both are relative accuracy measures
- Will not use distance dependent (proportional) expression of accuracy

<http://fgdc.er.usgs.gov/standards/status/swgstat.html>



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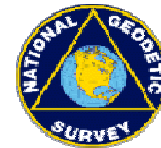
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Anticipated Shifts

Based on a preliminary adjustment of all FBN's
< 5 cm horizontal with average of 2.2 cm
< 10 cm vertical with average of 4.6 cm



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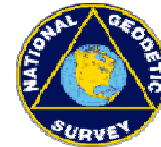
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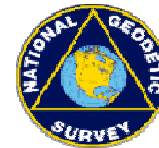
Time-line

Time-line for Readjustment of NSRS Positions and Ellipsoid Heights

- Projects received prior to June 2005 will be included in the computation
- Projects received after this date will be accepted for publication after the readjustment is done
- February 2007 – Adjustment complete
- May 2007 – Project Report finished



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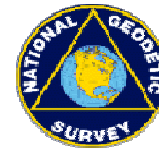
Stations *not* Included in the Adjustment

Including local or county networks ...

- NGS recommends that NAD83 data that is NOT part of the NSRS readjustment be readjusted by the user or their contractor, using original observation data.
- A set of national transformation parameters, and software, will be developed by NGS. This could be used to update coordinates of control points not included in the National Readjustment.
- OPUS DB – a new tool for Bluebooking a control point



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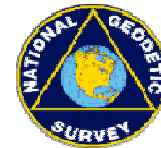
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- What?
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- **Questions?**



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