



SNC • LAVALIN

ATKINS

Member of the SNC-Lavalin Group

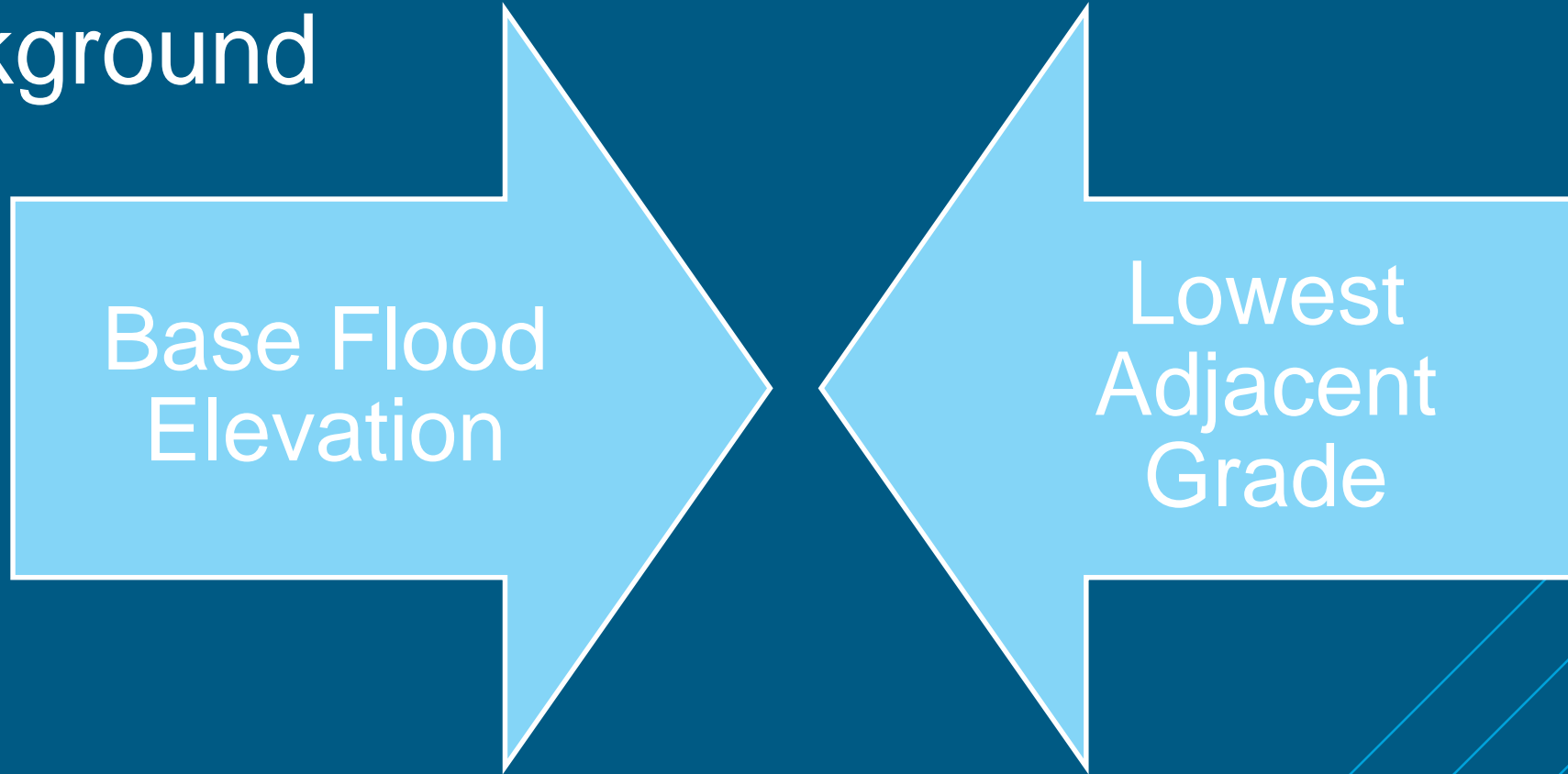
The BFEs Are(n't) All Right

An Assessment of Elevation Certificates and Implications
to the National Flood Insurance Program

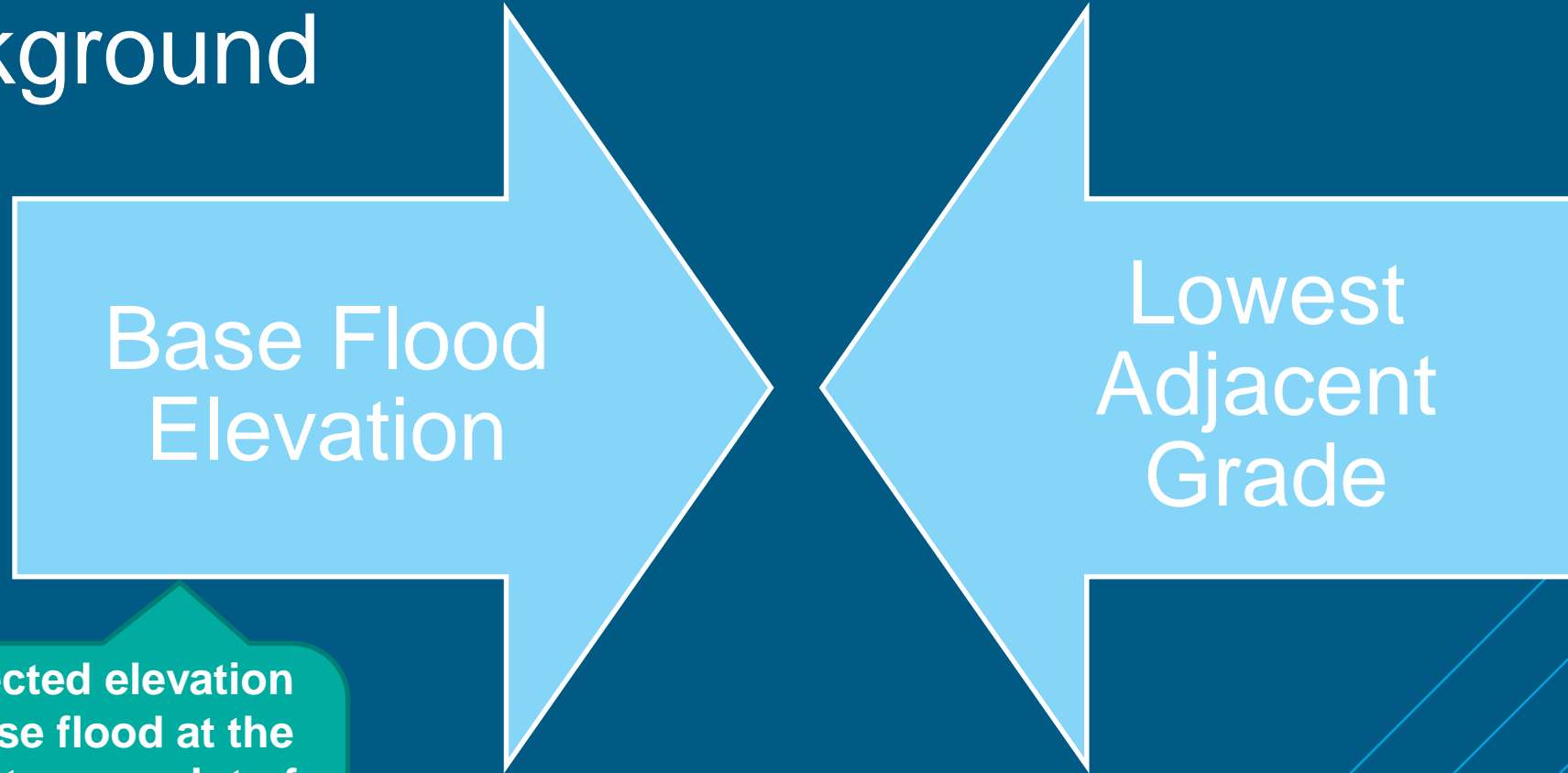
Jen Marcy, PMP, CFM

Shanna Michael, CFM

Background



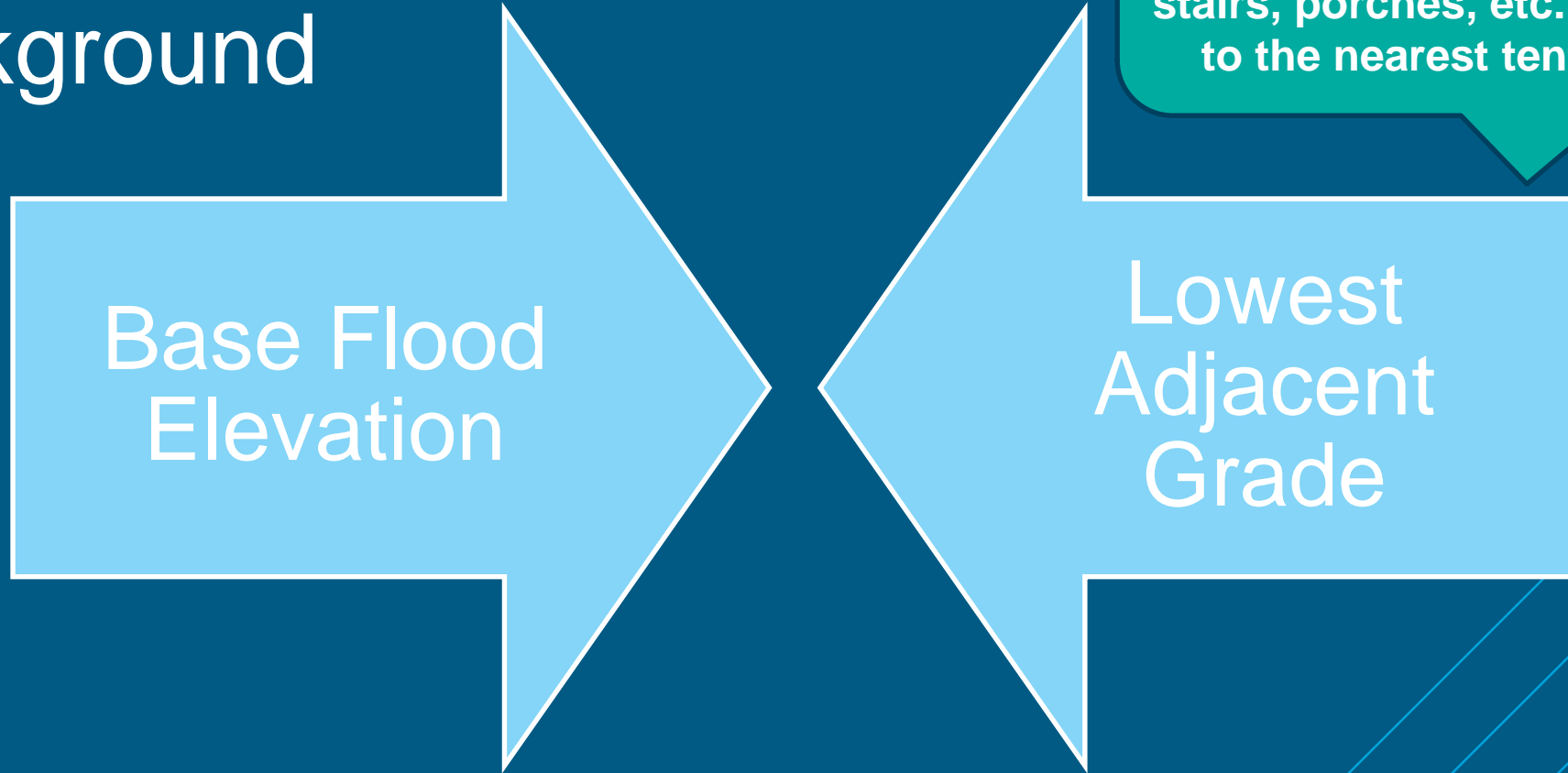
Background



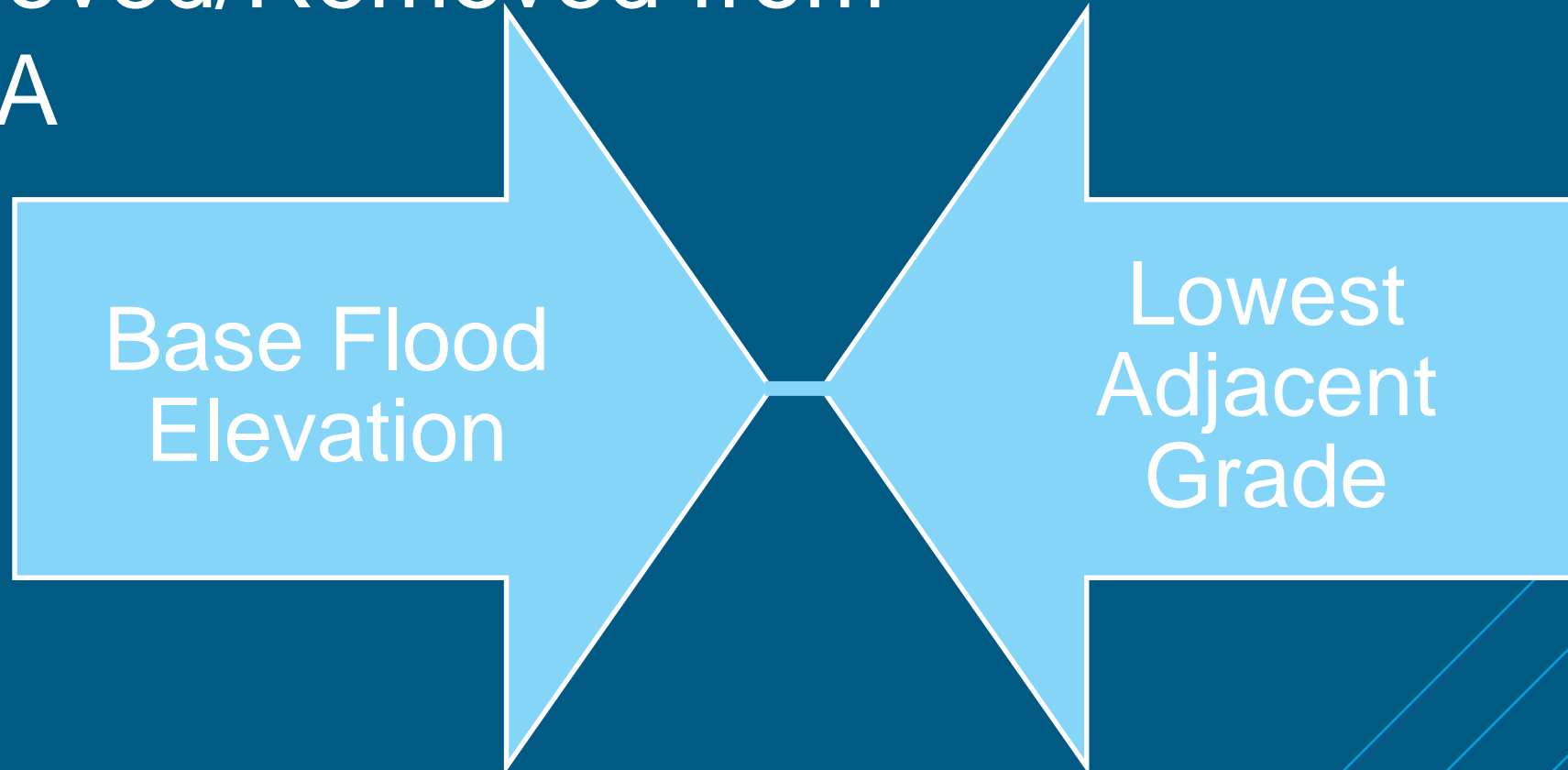
The expected elevation of the base flood at the most upstream point of a structure/property, to the nearest tenth of a foot

Lowest Adjacent Grade

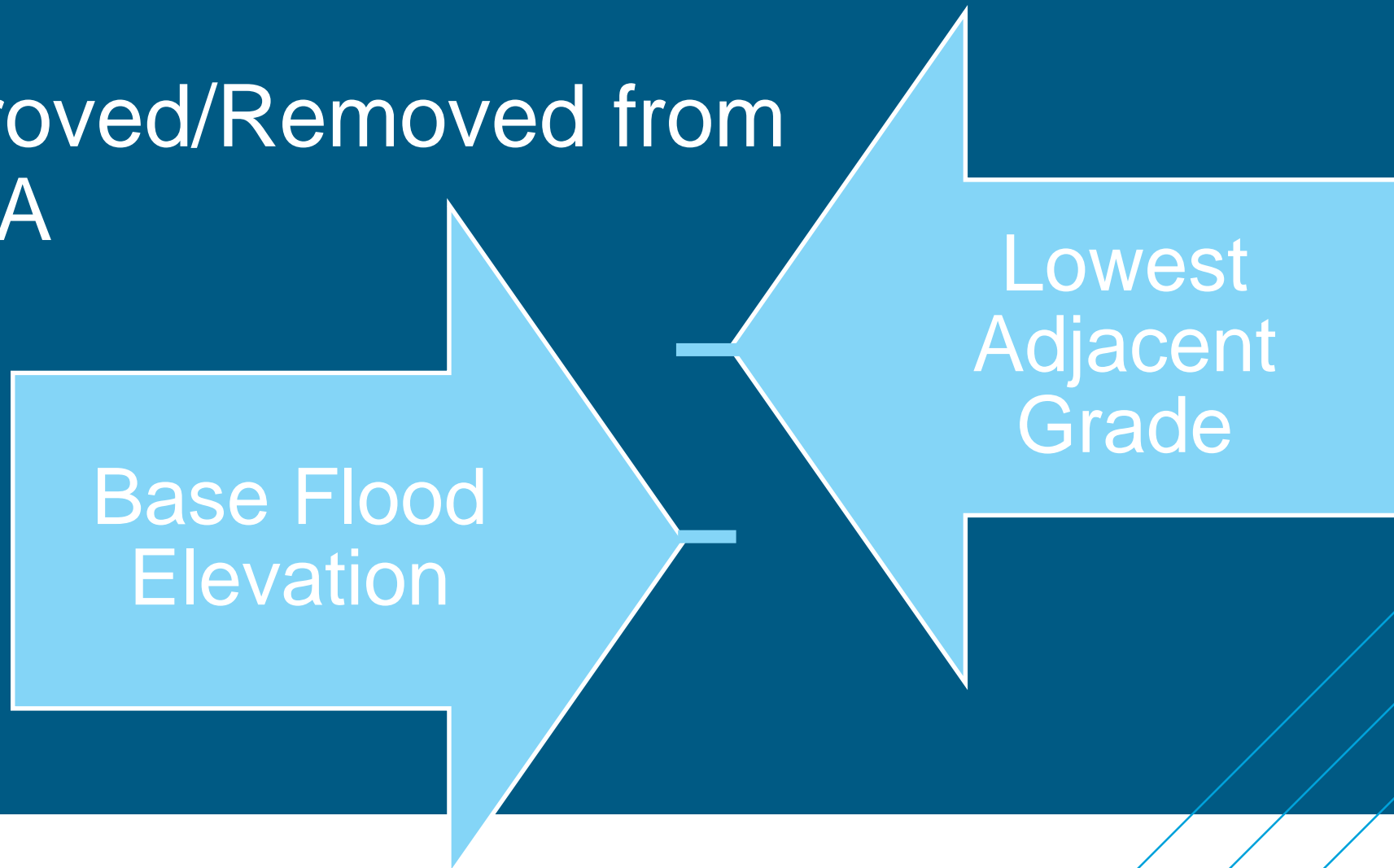
Background



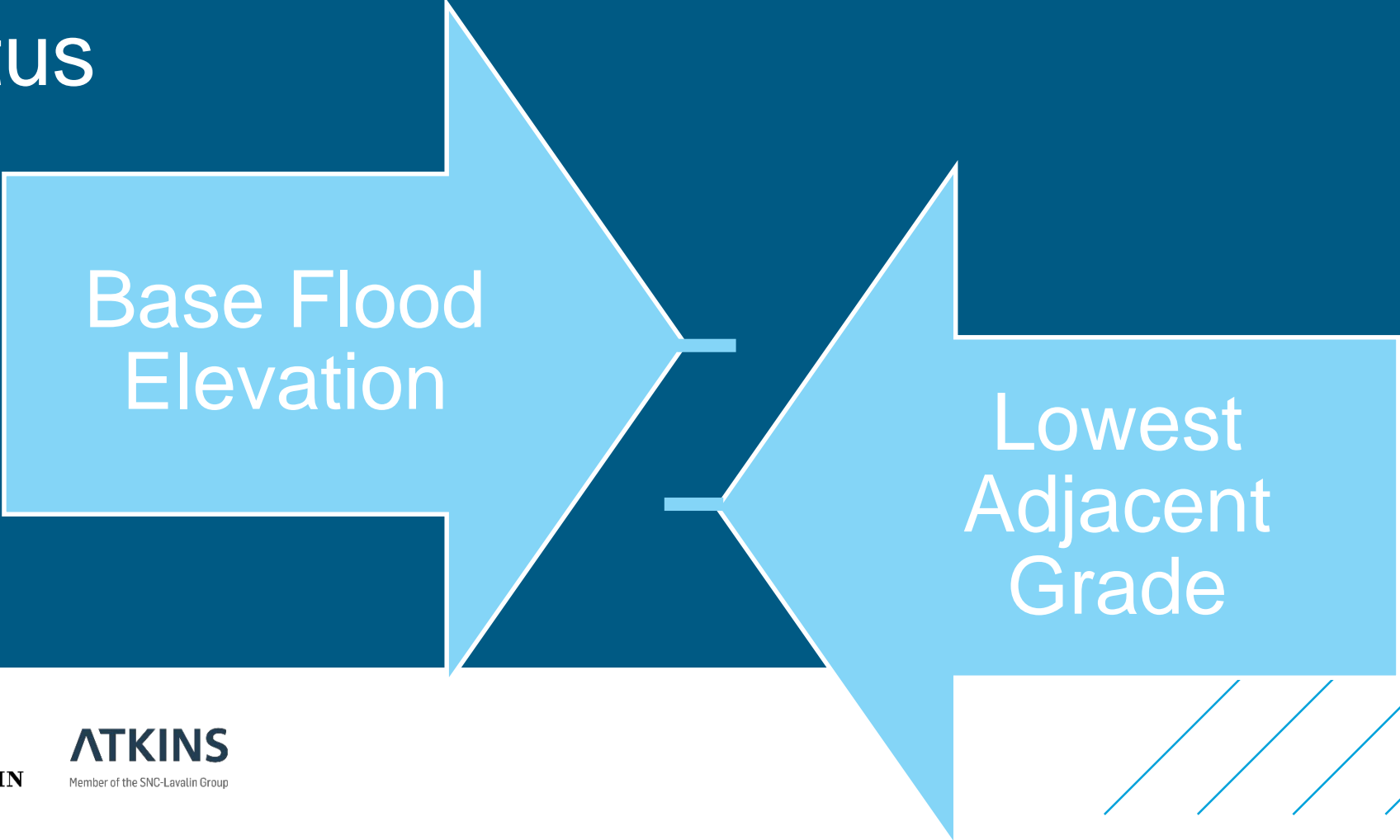
Approved/Removed from SFHA

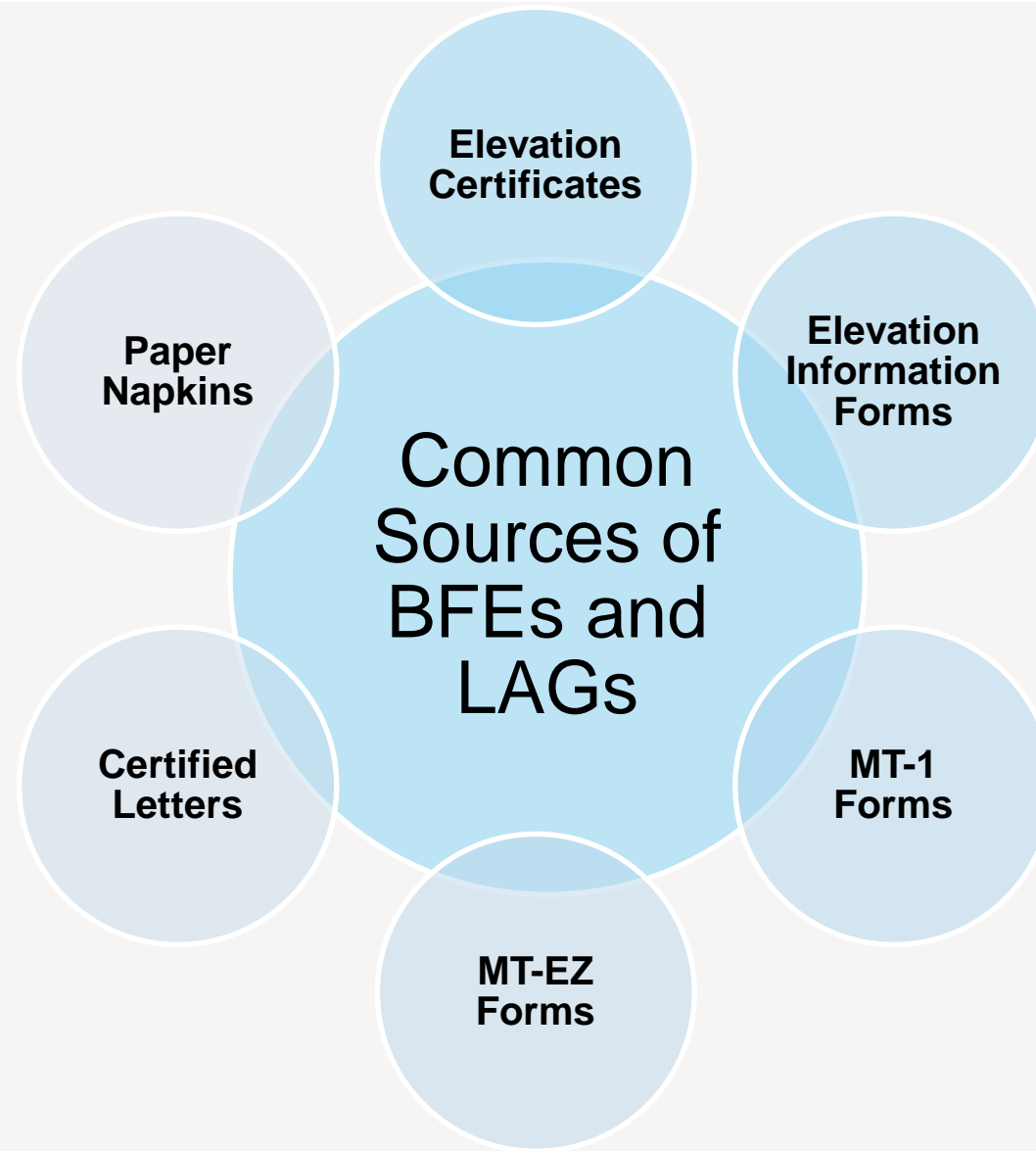


Approved/Removed from SFHA



Denied/Maintains SFHA status





Lessons I Learned being a LOMA Analyst

You can trust the property elevations on incoming certified documents

But the BFE is almost never correct

We (analysts) always did our own BFEs for every case

This has bothered me ever since...



Many, Many Years Later...

Opportunity to conduct an assessment

Pulled 790 scanned Letter of Map Change case files from 12 states* and 9 FEMA Regions to determine level of accuracy of incoming BFEs

346 cases were dropped from our assessment because they:

- › Were Zone A (no official BFE) or AO (depth instead of BFE)
- › Because a property-specific BFE was not determined for the case (generally dropped, OAS, and newer cases)
- › Were E-LOMAs (BFE audited until correct)
- › 444 cases were able to be assessed

*NY, MD, FL, KY, IL, IN, AR, OK, KS, CO, CA, and WA



Assessment Details (444 cases)

1. Reviewed scanned case files

- › All incoming materials
- › Notes/forms filled out by analyst
- › Final LOMA/LOMR-F

2. Documented

- › Case outcome (approved/denied)
- › The analyst-determined BFE
- › The incoming, certified BFE
- › Form of incoming BFE



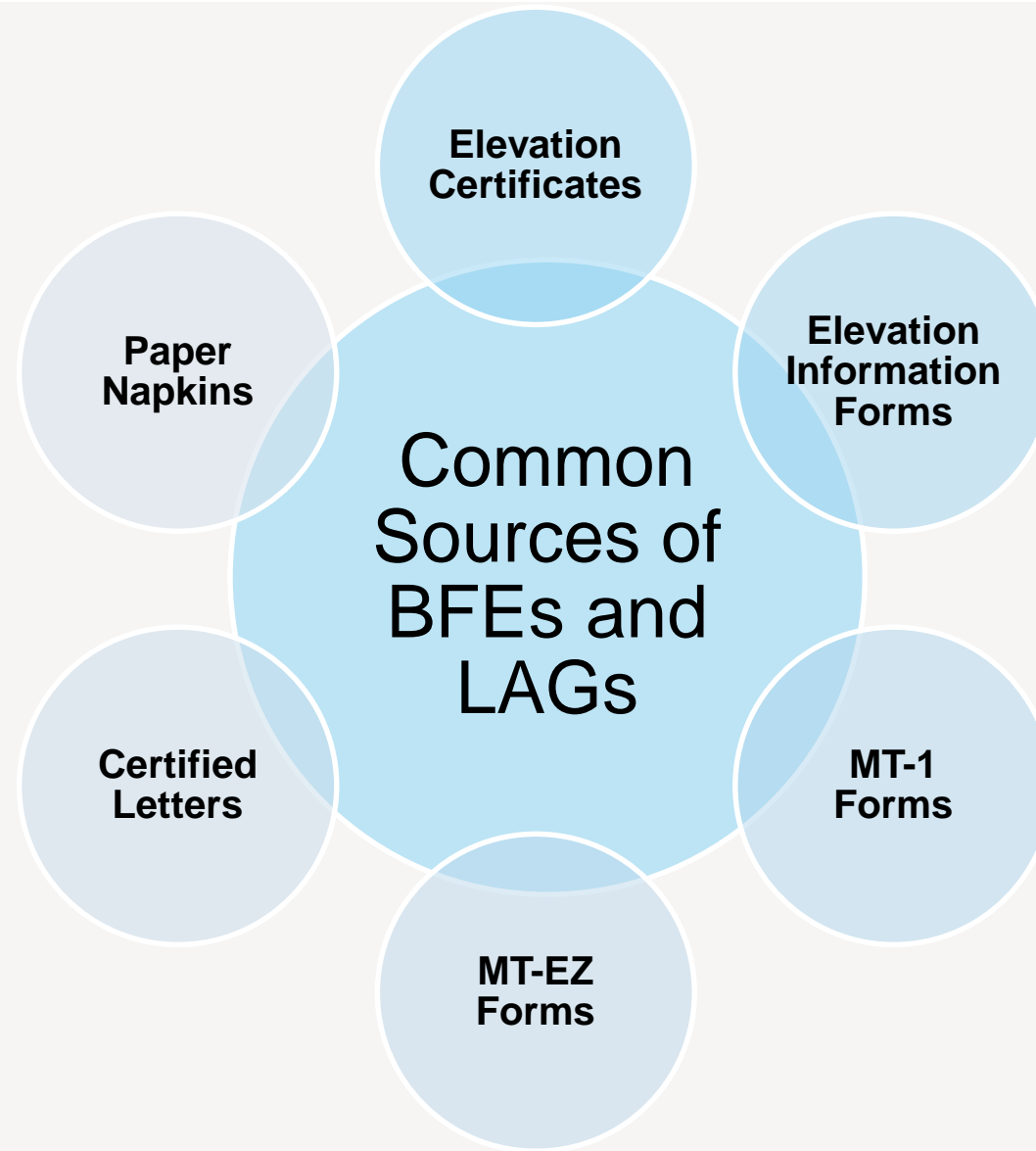
Results

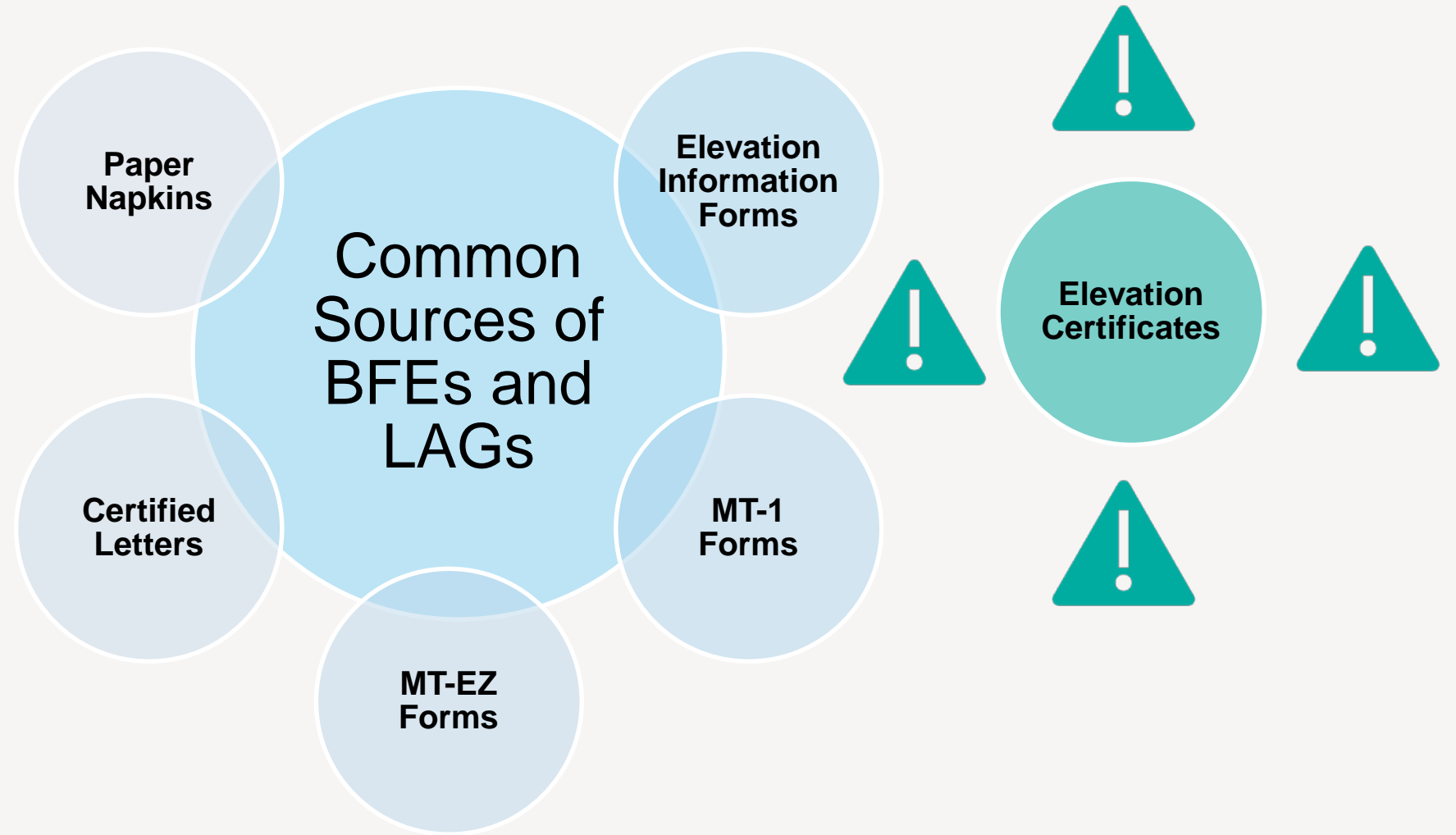
We found BFE errors between -4 feet and +5.6 feet* on over 80% of the incoming, certified supporting documentation

- › 156 were too high
- › 85 were correct
- › 201 were too low
- › 2 were non-sensical (“<1 foot, 1-3 feet” and “1331/12.74”)

* Does not include one outlier that listed a BFE on an EC that was 1,206.1 feet higher than actual BFE. Even with an assumed decimal error, the BFE would still have been still -13.3 feet in error.







Tells us how high to build lowest floors!

Used to rate flood insurance policies!

Common Sources of BFEs and LAGs

Paper Napkins

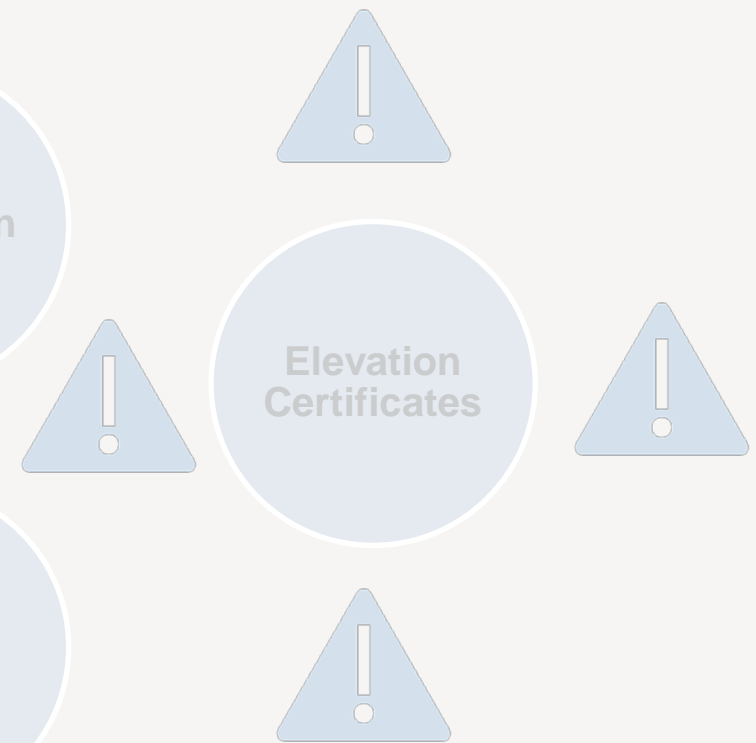
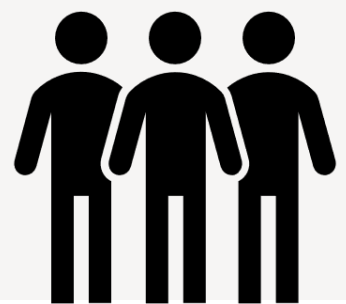
Elevation Information Forms

Elevation Certificates

Certified Letters

MT-1 Forms

MT-EZ Forms



Tells us how high to build lowest floors!

Used to rate flood insurance policies!

Common Sources of BFEs and LAGs

Paper Napkins

Elevation Information Forms

Elevation Certificate

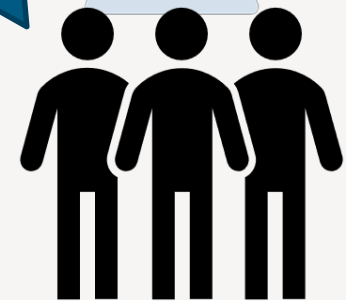
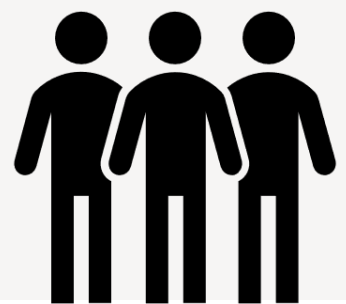
Certified Letters

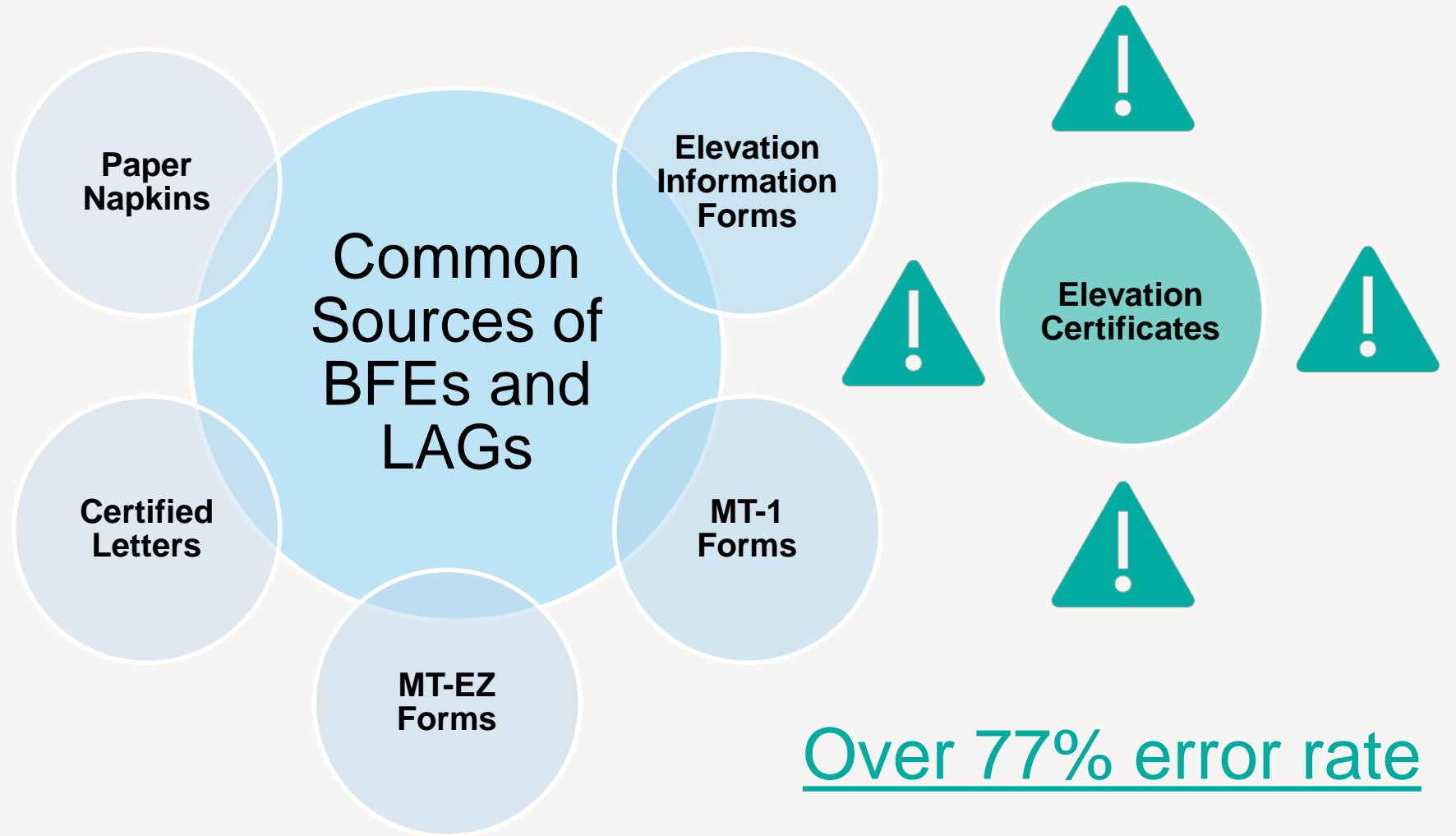
MT Forms

Helps me maintain compliance with 60.3!

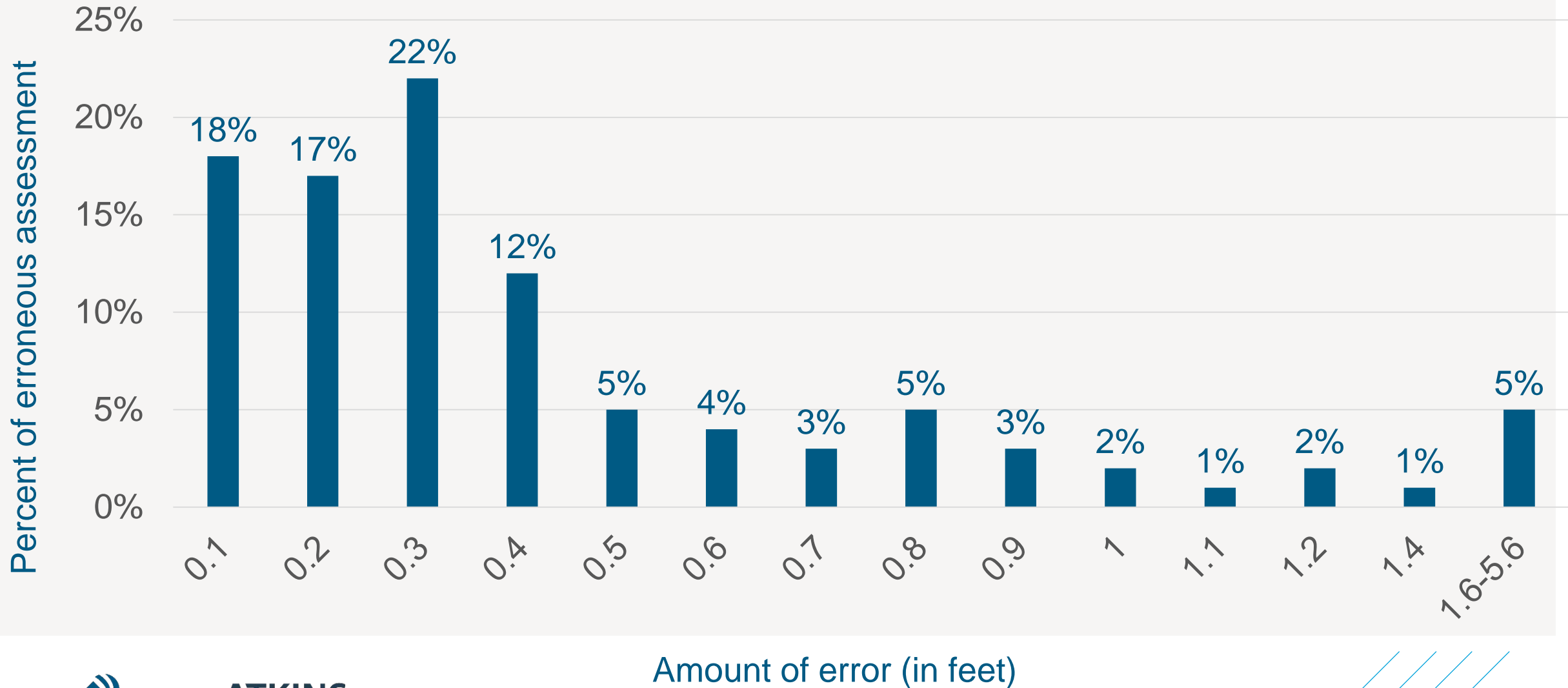
Is a minimum standard for CRS participation!

MT-EZ Forms

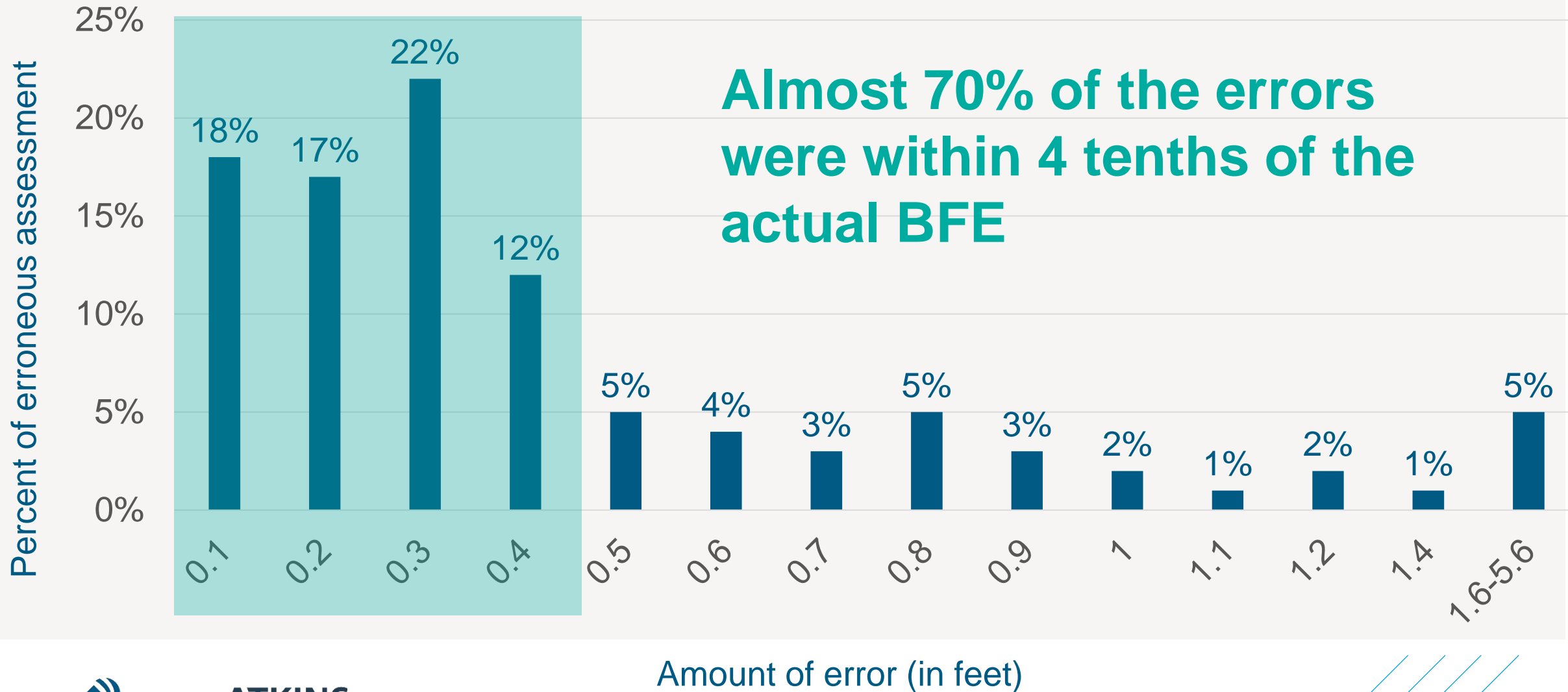




Extent of BFE Errors on Certified Documents



Extent of BFE Errors on Certified Documents



Does a Tenth of a Foot Even Matter?

BFE Error on EC	Example 1					Example 2			
	LF	BFE	LF-BFE	Rounded Elevation Difference		LF	BFE	LF-BFE	Rounded Elevation Difference
-1	10.2	8.7	1.5	+2		10.0	9.5	0.5	+1
-0.9	10.2	8.8	1.4	+1		10.0	9.6	0.4	0
-0.8	10.2	8.9	1.3	+1		10.0	9.7	0.3	0
-0.7	10.2	9	1.2	+1		10.0	9.8	0.2	0
-0.6	10.2	9.1	1.1	+1		10.0	9.9	0.1	0
-0.5	10.2	9.2	1	+1		10.0	10	0	0
-0.4	10.2	9.3	0.9	+1		10.0	10.1	-0.1	0
-0.3	10.2	9.4	0.8	+1		10.0	10.2	-0.2	0
-0.2	10.2	9.5	0.7	+1		10.0	10.3	-0.3	0
-0.1	10.2	9.6	0.6	+1		10.0	10.4	-0.4	0
Actual BFE	10.2	9.7	0.5	+1		10.0	10.5	-0.5	-1
+0.1	10.2	9.8	0.4	0		10.0	10.6	-0.6	-1
+0.2	10.2	9.9	0.3	0		10.0	10.7	-0.7	-1
+0.3	10.2	10	0.2	0		10.0	10.8	-0.8	-1
+0.4	10.2	10.1	0.1	0		10.0	10.9	-0.9	-1
+0.5	10.2	10.2	0	0		10.0	11	-1	-1
+0.6	10.2	10.3	-0.1	0		10.0	11.1	-1.1	-1
+0.7	10.2	10.4	-0.2	0		10.0	11.2	-1.2	-1
+0.8	10.2	10.5	-0.3	0		10.0	11.3	-1.3	-1
+0.9	10.2	10.6	-0.4	0		10.0	11.4	-1.4	-1
+1	10.2	10.7	-0.5	-1		10.0	11.5	-1.5	-2

Does a Tenth of a Foot Even Matter?

BFE Error on EC	Example 1				Example 2			
	LF	BFE	LF-BFE	Rounded Elevation Difference	LF	BFE	LF-BFE	Rounded Elevation Difference
-1	10.2	8.7	1.5		9.5	0.5		+1
-0.9	10.2	8.8	1.4		9.6	0.4		0
-0.8	10.2	8.9	1.3		9.7	0.3		0
-0.7	10.2	9	1.2		9.8	0.2		0
-0.6	10.2	9.1	1.1		9.9	0.1		0
-0.5	10.2	9.2	1		10	0		0
-0.4	10.2	9.3	0.9		10.1	-0.1		0
-0.3	10.2	9.4	0.8		10.2	-0.2		0
-0.2	10.2	9.5	0.7		10.3	-0.3		0
-0.1	10.2	9.6	0.6		10.4	-0.4		0
Actual BFE	10.2	9.7	0.5		10.5	-0.5		-1
+0.1	10.2	9.8	0.4		10.6	-0.6		-1
+0.2	10.2	9.9	0.3		10.7	-0.7		-1
+0.3	10.2	10	0.2		10.8	-0.8		-1
+0.4	10.2	10.1	0.1		10.9	-0.9		-1
+0.5	10.2	10.2	0		11	-1		-1
+0.6	10.2	10.3	-0.1		11.1	-1.1		-1
+0.7	10.2	10.4	-0.2		11.2	-1.2		-1
+0.8	10.2	10.5	-0.3		11.3	-1.3		-1
+0.9	10.2	10.6	-0.4		11.4	-1.4		-1
+1	10.2	10.7	-0.5		11.5	-1.5		-2

Yes.

Yes it does.

Trust me on this.

Other Implications

Floodplain Management issues communities may not be aware of – program implementation and unknown violations

Losses avoided-type studies that assume post FIRM homes are built to the correct BFE

Assumptions used in risk assessments could be incorrect

BW-12/HFIAA implications on rating

Other implications – grants? Post-disaster?



What's the problem?

What's the Solution?



80% of
certification
professionals are
doing it wrong?



What's the problem?



80% of
certification
professionals are
doing it wrong?

What's the Solution?

More training is
needed on how to
get a BFE the right
way?



What's the problem?

What's the Solution?



The materials from which BFEs are derived are not user-friendly?



What's the problem?

What's the Solution?



The materials from which BFEs are derived are not user-friendly?



What's the problem?



What's the Solution?

Are different products the answer?



The materials from which BFEs are derived are not user-friendly?



How Did We Even Get Here? 1973 DOI Guidance

VI. Pamphlets

In addition to the full scale quadrangle maps, attractive information pamphlets that describe the program and the maps will be prepared for selected cities and towns that have significant present or potential flood problems. The pamphlets will be printed, in color, in large quantities (1,000) for general distribution to the public. It is proposed to place them in public buildings such as post offices, banks, and libraries. The folders will cost more to print than the larger maps, and available funds are not adequate to permit a pamphlet for each large map. Pamphlets are prepared only for quadrangles where flood prone area maps have been completed.



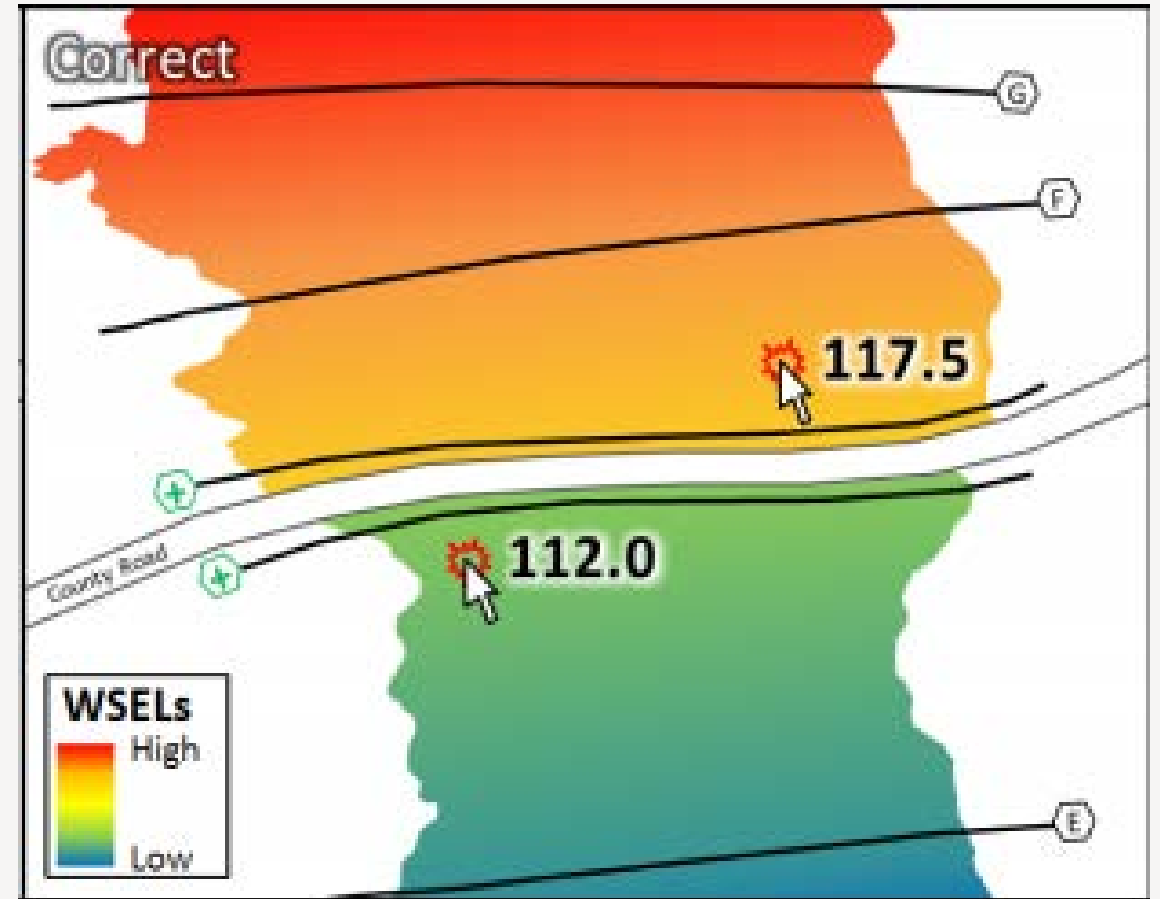
Can Digital Data Help?

Water surface elevation grids are part of FEMA's Flood Risk Products

Allow for point and click BFE options

Can be used with local data for better accuracy and precision

Available on FEMA's Map Service Center in some areas



Other Ideas

Digital Flood Insurance Study (FIS) option

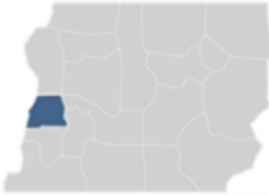
Downloading of model data

Point and click for elevation data

FLOOD INSURANCE STUDY

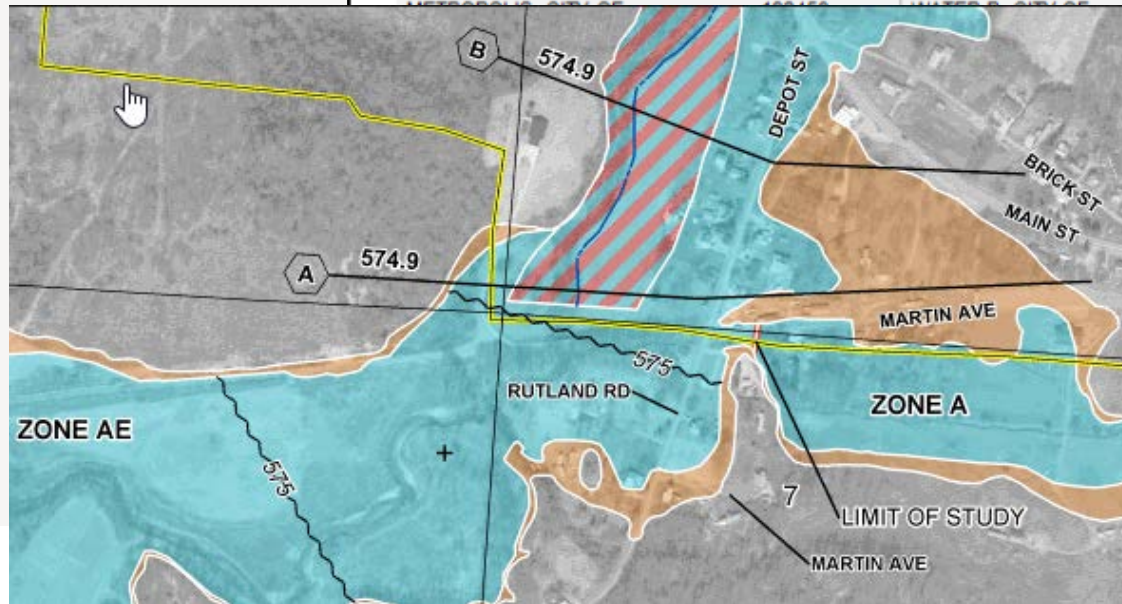
FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 1 OF 2



FLOOD COUNTY, STATE AND INCORPORATED AREAS

COMMUNITY NAME	NUMBER	COMMUNITY NAME	NUMBER
COASTLAND, CITY OF	123456	WATER O, CITY OF	123475
FLOOD COUNTY, UNINCORPORATED AREAS	123457	WATER P, CITY OF	123476
FLOODVILLE, TOWN OF	123458	WATER Q, CITY OF	123477
			123478
			123479
			123480
			123481



What Do you Think?

If you had access to the models, would that be helpful?

Would you need tools to help you interpret the data?

Is there something in-between paper FIRMs/FIS materials and access to downloadable models, can be made available everywhere, and doesn't require you to be an engineer or a GIS specialist?



What Do you Think?

If you had access to the models, would that be helpful?

Would you need tools to help you interpret the data?

Is there something in-between paper FIRMs/FIS materials and access to downloadable models, can be made available everywhere, and doesn't require you to be an engineer or a GIS specialist?



Are these the right questions?



What Do you Think?

Is a tenth of a foot taking it too far?

Are our maps even appropriate for that level of detail?

Does Risk Rating 2.0 make this all moot anyway?

Does it provide an opportunity to redesign the tools the program provides (FIRMs and FISs) to better suit the needs of the FPM community since the insurance community will no longer be needing it?



Wrap Up

Questions? Comments? Further Discussion?

Jennifer.Marcy@atkinsglobal.com

Shanna.Michael@atkinsglobal.com

