Questions and Answers from the March 6, 2019 CTP Webinar: Using LiDAR for LOMAs

How do I get the LOMA factsheet?

https://www.floodsciencecenter.org/koha?id=2831

Can we get the URL to the example Minnesota LOMR web app?

http://gis.anokacountymn.gov/flood/

What was the link to the Hennepin site?

https://gis.hennepin.us/naturalresources/map/

How much do Minnesota taxpayers pay for this ability to use your program and cut out the surveyor fee?

Nothing. The LiDAR data were publically available and being used for many purposes before this option to do the LOMA with LiDAR was started. This is just one more use of the LiDAR data collected and prepared using state taxpayer funding.

Note that one of the biggest groups of users of the LOMA with LiDAR method is surveyors. MN hears all the time from our surveyors about how valuable the data is. Surveyors give the example of charging half or less of what they'd normally have to charge for a field survey, so it keeps the fee more affordable and more homeowners are able to go forward with getting the survey. Some surveyors have marketed lower cost options to prepare the needed map and fill out the LOMA paperwork when the building is eligible for the LOMA with LiDAR (in about $200 range is what we've heard).

Surveyors also use the state LiDAR viewer – MNTOPO – to spot check elevations before going to a site and check whether the Lowest Adjacent Grade is likely to be above the BFE (since they want to get paid, and sometimes have trouble getting paid if they find the LAG is below the BFE and the structure not eligible for a LOMA).

The fees charged by cities and counties to prepare the needed map varies, but is sometimes no charge and sometimes involves a nominal fee.

Examples we've been shown are single family. Can developers use this, and if so, how large a development could use the LiDAR process?

There isn't a limit on size for the LiDAR LOMA process. Keep in mind that cases involving the placement of fill, proposed construction, the regulatory floodway or physical changes normally handled through the LOMR process **cannot be submitted** as a LiDAR LOMA.

Is a different fee charged by FEMA for this review of is it the same as any LOMA?

FEMA does not charge fees for any LOMA to include the LiDAR LOMA.

Is the identification of area of buildings done manually?

The building polygons are extracted from the intensity imagery through an automated process, then cleaned up manually.

Was there any funding issues for this project?

For the MN pilot project, there were no funding issues. It just involved the time of staff supported by CAP-SSSE and CTP funding. The LiDAR collection was a separate effort.

What was the buffer requirement between lag and BFE?

MN project used 1 foot since the accuracy of the LiDAR was sufficient to develop 2 foot contours. And only contours totally below the structure could be used, so that added additional buffer.

Were the 3 points 1008, 1016 & 1100 for LAG using LiDAR data all interpolated points, or actual LiDAR measured points?

LiDAR DEM was used to derive XYZ. The DEM is a 1m grid created by making a TIN surface of the points that were classified as bare earth, then formatting to a grid, so the point measurements we used were extracted from this interpolated grid (the DEM).

Does the LiDAR need to be publically accessible online?

One of the requirements of the data is that it is available publically online for download. This doesn't have to be through a viewer or other visualization, but available for free and public access.

"Where comparison is close, certified elevations required." Can it be defined what is called "close"?

If a contour exhibit derived from LiDAR is submitted, FEMA will subtract ½ the contour interval or 1 foot (whichever is greater) from the lowest contour immediately adjacent (but not going through) the structure. If point cloud exhibits are provided, FEMA will subtract 2 feet from the lowest point immediately adjacent to the structure. If the structure could not be removed using either of these two methods, certified elevations are required. If you know the structure to be very close to the BFE, it is safest to err on the side of certified elevations.

Do LiDAR collection packages from Quantum Spatial also include aerial images from the date of collection?

Imagery can be acquired as part of a LiDAR project. Imagery was not acquired as part of this specific project.

Can you get a LOMA when the LAG is above the BFE, but the house has a basement or crawl space below the BFE?

This process is for LOMAs. It can't be used for structures on filled sites. For LOMAs, the LAG is compared to the BFE. The basement and crawl space aren't part of the determination.

As part of a community's NFIP flood ordinance, residential structures should not have their lowest floor below the BFE, per Code of Federal Regulation (CFR) 44, unless in a community approved for residential basements. How does the LiDAR data account for LOMA cases where a structure/community may get flagged for possible violation?

LOMAs are only for "natural grades."

For the issued LiDAR LOMAs, have these primarily been submitted directly from the property owners or are they coming from a surveyor who has helped them through the process?

The LiDAR LOMAs can be submitted by registered surveyors, professional engineers or local government staffs. Property owners aren't on the acceptable submitter list.

Northwind is one of my contractors processing LOMA/MT-1 applications correct? I believe Michael Baker processes the most, correct?

Northwind Resource Partners is FEMA's contractor that processes MT-1 requests for the nation. FEMA only has one contractor that does this work. Michael Baker International is a partner on this team.

Our county recently obtained LiDAR data in 2016. How do we get that approved for LiDAR LOMAs?

FEMA is not reviewing and approving individual LiDAR datasets. The USGS QL3 standards are available online for local communities to determine if their data meets these standards (https://pubs.usgs.gov/tm/11b4/pdf/tm11-B4.pdf).

Does FEMA pay for LiDAR collection for counties, and if so, up to QL3 only? If a county wants QL2 or QL1, is there a way to upgrade or pay the difference?

FEMA has purchased and is working with the USGS to purchase LiDAR data in the future. FEMA purchases the most appropriate product for the ongoing floodplain mapping project. Past purchases included QL3, so FEMA wanted to ensure that large investment would be useful for this product. As QL2 and QL1 datasets are purchased in the future, these will be available for use with LiDAR LOMAs. FEMA is purchasing LiDAR for floodplain mapping updates and specifically for LiDAR LOMA so there isn't a way to order LiDAR for this process. FEMA regional offices determine where floodplain mapping updates will be done in the future.

What were the main considerations for choosing QL3 versus QL2? Recent LiDAR acquisitions in the east are QL2.

The LiDAR data collect started over 10 years ago. Future acquisitions will be QL2.

Was the USCOE Silver Jackets involved as well?

No.

Do you take in consideration of buildings with a basement?

This process is for LOMAs. It can't be used for structures on filled sites. For LOMAs, the LAG is compared to the BFE. The basement and crawl space aren't part of the determination.

How many LiDAR submissions are getting rejected compared to the 37 submissions that were accepted?

The map shows between 2/28/18 and 2/15/2019(map creation date) there were 57 approved LiDAR LOMAs. When a submittal doesn't meet the LiDAR LOMA requirements, certified elevations are requested so no submittal is rejected. The determination is made from the certified elevations. It is estimated that 1 in 3 submittals currently require certified elevations instead of LiDAR.

Were there any limitations to using LiDAR in flat areas? In flat areas where the 2 foot contours are fewer and far between wouldn't the accuracy of the LiDAR start to factor in?

In flat areas the buffer area is larger than in steep areas because it is an elevation buffer not a horizontal buffer.

The map of approved LOMAS indicated that one had been successfully processed in Alaska, but the map of approved QL3 LiDAR data in the country indicated none existed in Alaska. What other data can we use that would be acceptable?

At this time, LiDAR is the only dataset that FEMA is accepting in lieu of certified elevations for structures that meet the subtraction requirements. The map depicted the areas of LiDAR through the USGS (QL4-QL1 are depicted on the map). It is possible that the Alaska example was locally collected data that would not necessarily be on the USGS map. Additionally, the map is dated June 2018 and there are likely to be more datasets now.

Will this allow citizens to submit their own LOMR applications, without a surveyor?

The LiDAR LOMA is not for many different types of MT-1 cases that are typically issued under that determination. And they are absolutely not for physical revisions to the floodplain that would be processed through a LOMR. All LOMRs require the certification of a registered professional engineer or surveyor.

Is there a template or GIS workflow available to develop a LiDAR LOMA?

FEMA is working on updating the MT-1 forms to speak to the submittal requirements for a LiDAR LOMA.

Can individual property owners submit such applications? Or does it has to be by the community/surveyor?

It has to be the community/surveyor.

What is liability on applicant if the data reported is done wrong?

The MT-1 application form is still required for a LiDAR LOMA and the applicant's signature is required for the following statement:

> All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Administrative mistakes can be corrected through the LOMA correction process where the applicant alerts FEMA to the error and FEMA issues a new determination with changes.

Should the LiDAR be used inappropriately or incorrectly, FEMA may rescind the determination until certified elevations can be submitted.

Are you using classified or unclassified las data to identify 3D structures?

For this project, the LiDAR (in las format) was classified to ground, building, water and default. Buildings do not always need to be put on their own class to map structures. DSM and Intensity imagery can be used to identify structures. High resolution imagery is also helpful to identify structures if it is available.

Have you noticed a significant increase in the number of LOMAs in areas with LiDAR?

From MN's perspective, we haven't seen more, just less complaining about cost of field survey for obvious errors.

The state provided the LiDAR, but it was the responsibility of the community to generate the contour maps? Does state provide any oversight?

The community needs to use the state-generated contour map. The state provides the registered surveyor certified contour data on public site.

Can this process get the property out of the flood zone or just a building?

This process can be used on a building or a parcel of land. FEMA uses the lowest lot elevation to compare against the BFE in these cases. The same subtraction requirements are in place on property.

Is the Minnesota certification by surveyor a certification of accuracy of contours?

Yes and of the LiDAR DEM.

What about the certification of the accuracy of the aerials in Minnesota?

That wasn't certified.

Who can I follow up with on the aerial accuracy question. If the home is slid one way or the other due to inaccurate aerial, it could provide a false result.

Where there is a question, the effective FIRM can be the best resource for the structure's placement in the SFHA.

"It must meet USGS Guidelines": What USGS Quality Level?

FEMA accepts USGS QL3 or higher.

Who certified the LiDAR data?

In Minnesota, the DOT registered surveyor in charge of determining the accuracy of the LiDAR data and the 2-ft topo contour derivatives certified the LiDAR data for LOMA applications.

Are those orthorectified LiDAR photos for Hennepin County? Is the mapping been verified for horizontal or positional accuracy?

The Hennepin County current effective floodplain mapping is a digital capture of the paper maps. It has not been verified for horizontal accuracy.