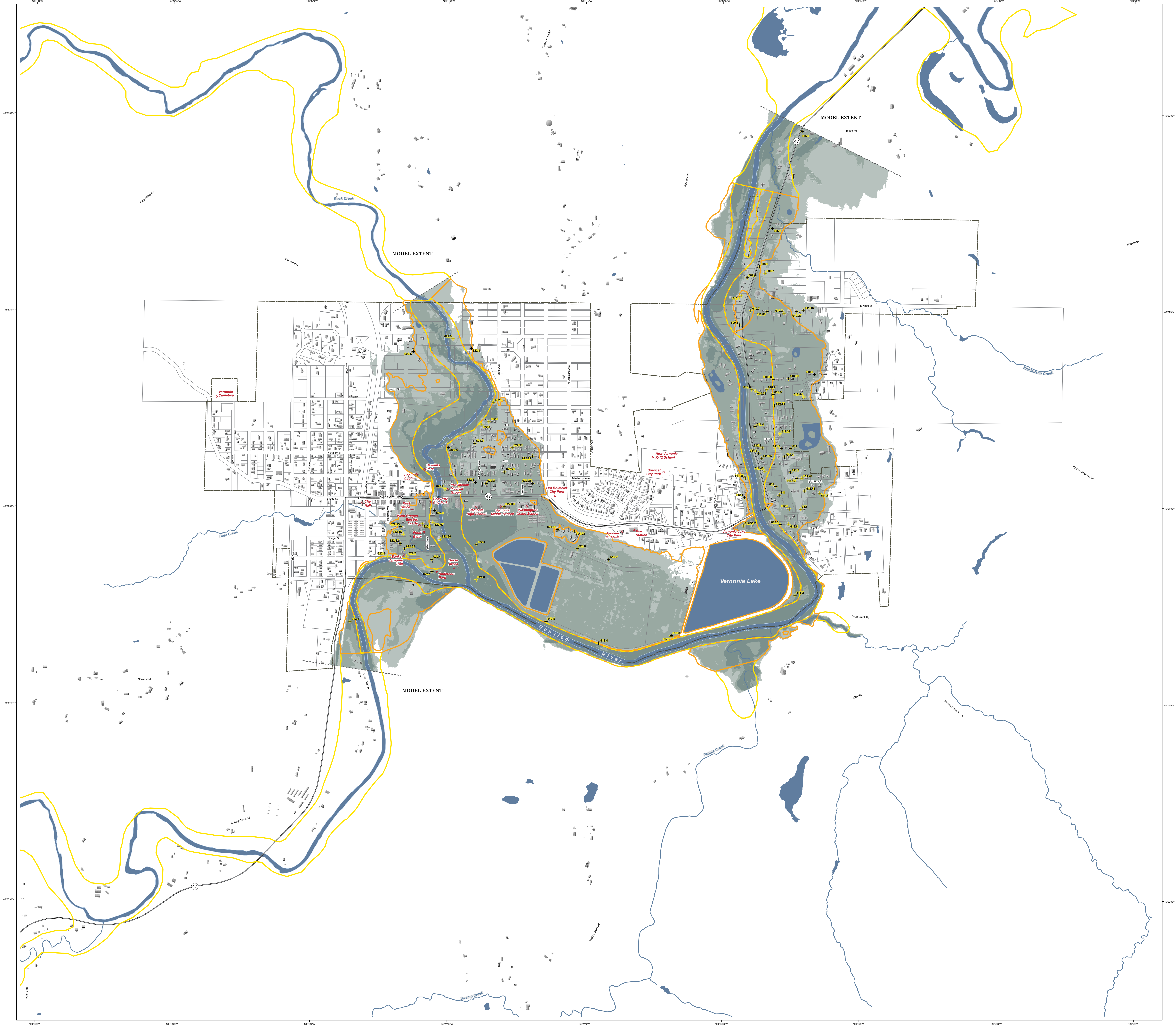


STATE OF OREGON  
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# Lidar-Based Water Depth of Flood of Record (December 2007) City of Vernonia, Columbia County, Oregon 2013

OPEN-FILE REPORT O-13-03  
Lidar-Based Maps for the City of Vernonia, Columbia County, Oregon,  
Pursuant to Oregon Executive Order No. 18-07

PLATE 4



## INTRODUCTION

Much of the public infrastructure and property in the city of Vernonia, Oregon, was damaged by a long-duration winter storm in December 2007. A series of three storms arrived over three consecutive days, producing severe winds and heavy rain that resulted in widespread record flooding throughout the region. As directed by the State of Oregon Executive Order No. 18-07, "Rebuilding Vernonia's Schools and the Surrounding Community in the Wake of December 2007 Storms," the Oregon Department of Geology and Mineral Industries (DOGAMI) created a set of lidar-based maps to aid in assessing the vulnerability of critical and essential facilities to flood and landslide hazards. Landslide inventory maps for the city of Vernonia were also created in conjunction with this map series. See DOGAMI publications IMS-51 and IMS-55 for more information.

## MAP EXPLANATION

This map shows the results of a GIS model of the flood of record for the City of Vernonia that occurred on December 3, 2007. The model is a digital representation of the flood event that was created using the high water mark data collected on December 19, 2007, by the U.S. Army Corps of Engineers (USACE) and the Federal Emergency Management Agency (FEMA). The high water mark data were adjusted to more accurately reflect the location of the data based on tax lot addresses and the lidar-derived building footprints. The lidar base-map topography was then subtracted from the adjusted flood elevation surface to produce a grid showing maximum flood depth throughout the city.

## DATA SOURCES

Lidar source: LIDAR 2011\_47123-02 Vernonia. The lidar was flown in June 2009.  
Please see the following website for more information:  
<http://www.OregonGeology.org>  
Other data: The Vernonia city limit was provided by the Oregon Department of Transportation (ODOT, 2009). All other vector and raster datasets were created by the Oregon Department of Geology and Mineral Industries (DOGAMI).  
Projection: UTM Zone 10 North, Datum: NAD83, Unit: meter  
Software: Esri ArcGIS version 10.0 and Adobe Illustrator CS5

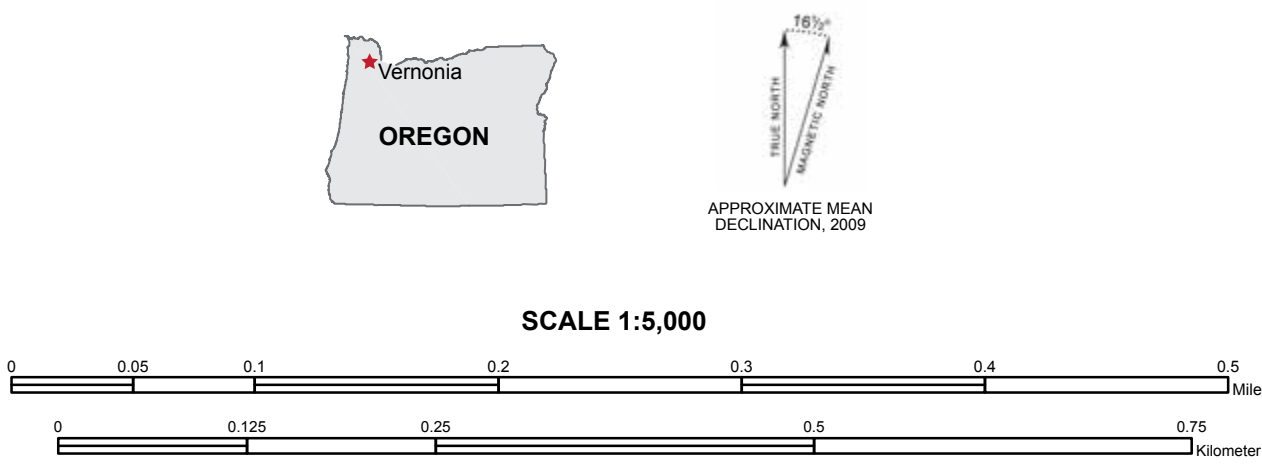
## WHAT IS LIDAR?

The lidar data used to create this map were collected from a light aircraft carrying a highly accurate laser scanner. The scanner makes over 100,000 measurements each second to build up a three-dimensional "point cloud" model of the surface of the earth and the vegetation and structures on it. A computer sorts the points, separating those that measure the ground from those that measure other objects such as trees or buildings. Images derived from these sets of points are then merged with other forms of digital data to create this map.  
The Oregon Department of Geology and Mineral Industries (DOGAMI) has been collecting lidar data in Oregon since 2006. The goal is to cover the entire state as funding for data collection becomes available. You can learn more about lidar and view lidar images of other parts of Oregon at [www.OregonGeology.org](http://www.OregonGeology.org).

## MAP SYMBOL EXPLANATION

- Highway
- City Boundary
- Stream or Creek
- Waterbody
- Buildings
- USACE High Water Mark Location and Elevation (ft)

- Water Depth of Flood of Record
  - 0 - 3 ft
  - 3 - 6 ft
  - > 6 ft
- 100-Year Flood Zone (USACE approximate riverine areas)
- 100-Year Flood Zone (USACE detailed study areas)
- Floodway



## MAP PLATE ACKNOWLEDGMENTS

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## NOTICE

This map series depicts an inventory of existing features based on published and unpublished reports and interpretations of topography derived from lidar data. These maps cannot serve as a substitute for site-specific investigations by qualified practitioners, which may give results that differ from those shown on the maps. These maps are not intended to provide authoritative locations for any of the features depicted. Although the maps are derived from highly accurate lidar imagery, they should not be used for engineering or survey purposes.



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