

# **NOAA COASTAL MAPPING PROGRAM PROJECT COMPLETION REPORT**

## ***PROJECT OR1802-CM-T***

### ***Willamette River at Wilsonville, Oregon***

#### **Introduction**

Coastal Mapping Program (CMP) Project OR1802-CM-T provides highly accurate digital shoreline data for a short stretch of the Willamette River (between river miles 37.5 – 39.8) in the vicinity of Wilsonville, Oregon. The Geographic Cell (GC) may be used in support of the NOAA Nautical Charting Program (NCP) as well as geographic information systems (GIS) for coastal zone management applications.

#### **Project Design**

Project OR1802-CM-T was designed per a request from the Marine Chart Division (MCD) of the Office of Coast Survey, NOAA, for GIS data in support of efforts to chart new marinas and correct the positioning of charted bridges in the project area. As a result of a source data search color aerial photographs from the NGS/FAA Airport Survey Program (ASP), acquired by a third-party contractor, Miller Creek Aerial Mapping (MCA), were found to cover the requested area.

#### **Field Operations**

The field operations consisted of the acquisition of aerial photography, the collection of Airborne GPS data, and surveying of ground control and check points. Aerial survey operations were conducted by MCA using a Cessna 206 Stationair (N94NM) aircraft on September 10, 2015. A total of 80 photographs in 8 flight lines were exposed using a Jena LMK 3015 camera system with a six-inch focal length lens on Kodak AeroColor Negative Film. All photographs were acquired at a nominal altitude of 8,000 feet above ground. The 1:16,000 scale photographs were processed and scanned at 12.5 micron resolution, resulting in an approximate ground sample distance (GSD) of 0.20 meters.

Ground Survey operations were conducted by a sub-contractor, WHPacific, Inc., using Trimble R8 and R10 GPS receivers following standard techniques for first-order accuracy. In addition to the standard ASP features, 24 ground control points and 5 check points were surveyed between January and April 2016 in order to serve as photogrammetric control for the aerotriangulation of the aerial imagery.

For further information refer to the MCA Aerial Photography and Final Survey Reports for Aurora State Airport (UAO) on file with other project data within the Remote Sensing Division (RSD) Electronic Data Library. Note that the Airborne GPS data collection equipment and procedures were not described in any of the MCA reports.

## Aerotriangulation

Aerotriangulation of the project photographs was performed by MCA in April 2016. All eight strips of photographs were triangulated in a single-block bundle adjustment using ImageStation Automatic Triangulation (ISAT) software. The 24 surveyed ground control points were used in conjunction with the airborne GPS to control the adjustment. The 5 surveyed check points were measured to have an average horizontal error (RMSE) of 0.436 feet (0.13 meters). In May 2018 RSD personnel performed a further accuracy assessment using the X and Y standard deviations (sigmas) of all adjusted ground points from the ISAT solution, resulting in a predicted horizontal circular error of 0.11 meters based on a 95% confidence level. For further information refer to the MCA Aerotriangulation Report, UAO\_ISAT\_Report, and the OR1802 Accuracy Assessment spreadsheet on file within the RSD Electronic Data Library.

Note that the project was initially set up and imported into BAE Systems SOCET SET (ver. 5.6) for review under the ASP program using the original coordinate system: Oregon State Plane North on the North American Datum of 1983 (2011), in units of International Feet. When the data was copied to a new SOCET SET project for the purpose of Coastal Mapping, the coordinate system was converted to UTM Zone 10N (NAD83) in meters.

## Compilation

The data compilation phase of the project was accomplished by a member of RSD in May 2018. Of the 80 images acquired, only one stereo-pair was used for this project. Digital feature data was compiled using SOCET SET (ver. 5.6) software. Feature identification and attribution within the GC were based on image analysis of the aerial photographs and information extracted from the appropriate NOAA nautical charts and other ancillary sources. Feature attribution was assigned in compliance with the Coastal Cartographic Object Attribute Source Table (C-COAST), which provides the definition and attribution scheme for the full range of cartographic features pertinent to the CMP. Selected features were further modified with additional descriptive information to refine general classification.

Spatial data accuracies for Project OR1802-CM-T were determined according to standard Federal Geographic Data Committee (FGDC) practices. Cartographic features were compiled to meet a horizontal accuracy of 0.2 meters at the 95% confidence level. This predicted accuracy of compiled well-defined points is derived by doubling the circular error calculated from the AT statistics.

The following table provides information on the images used in compiling this project:

Date	Time (UTC)	Strip	Photo #s	Photo Scale	GSD	Tide Level*
10-SEP-2015	22:22 – 22:23	4	091 – 092	1:16,000	0.20 m	N/A

\* This portion of the Willamette River is upstream of the falls and is non-tidal.

## Quality Control / Final Review

Quality control tasks were conducted during all phases of project completion by a senior member of RSD. The final QC review was completed in June 2018. The review process consisted of an assessment of the identification and attribution of cartographic features according to image

analysis and criteria defined in C-COAST. The quality control process concluded with an inspection of topological connectivity within the GC using ArcGIS (ver. 10.5) software. All project data was evaluated for compliance to CMP requirements.

Comparisons of the largest scale NOAA nautical charts with project imagery and compiled project data resulted in creation of the Chart Evaluation File (CEF). The following nautical chart was used in the comparison process:

- 18529, 10<sup>th</sup> Ed., Sep. 2002

## **End Products and Deliverables**

The following specifies the location and identification of end products generated during the completion of this project:

### **Remote Sensing Division Electronic Data Library**

- Aerial Photography Report
- Final Survey Report
- Aerotriangulation Report
- Project database
- Project Completion Report (PCR)
- GC11424 in shapefile format
- CEF in shapefile format

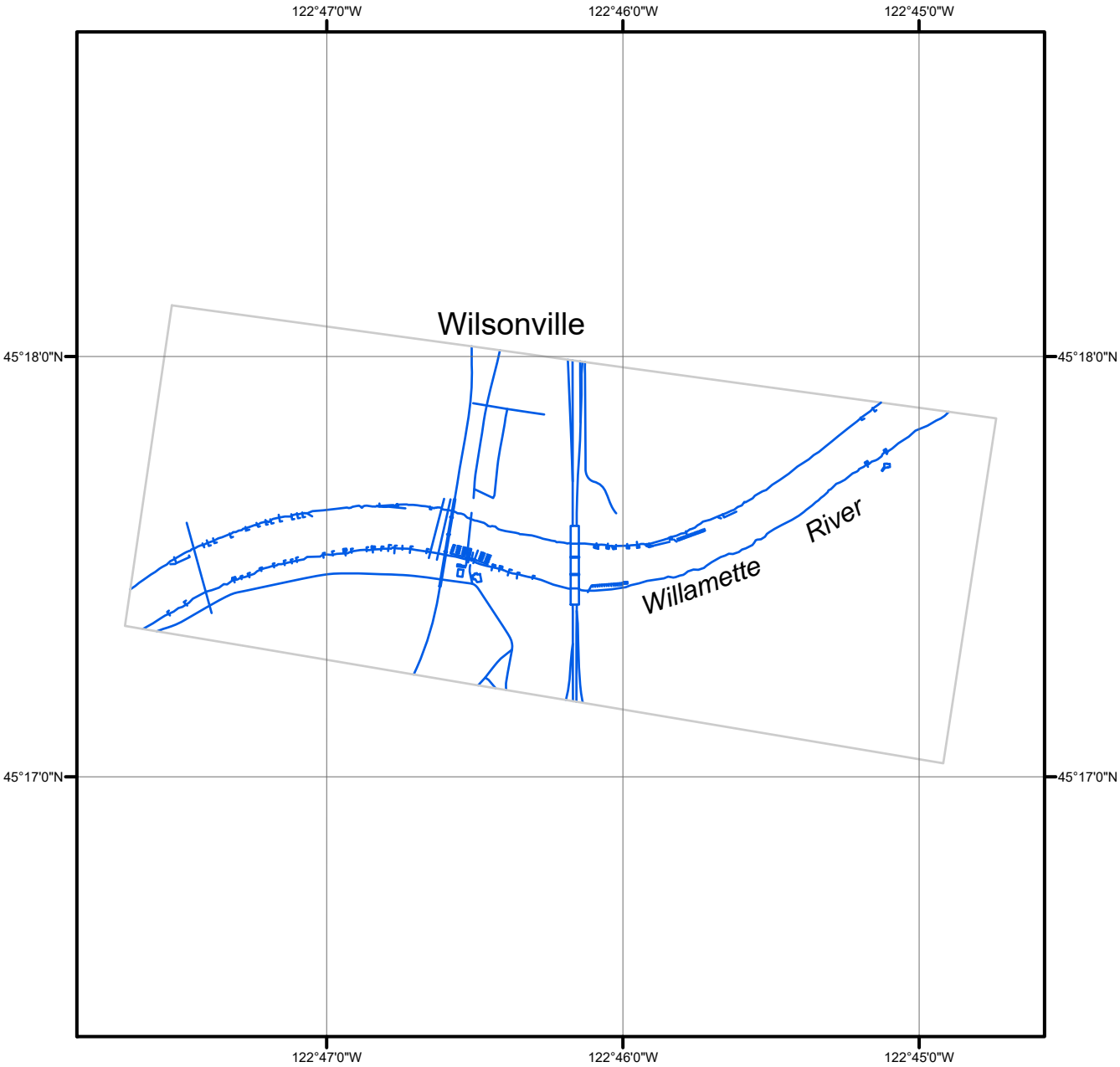
### **NOAA Shoreline Data Explorer**

- GC11424 in shapefile format
- Metadata file for GC11424
- PCR in PDF format

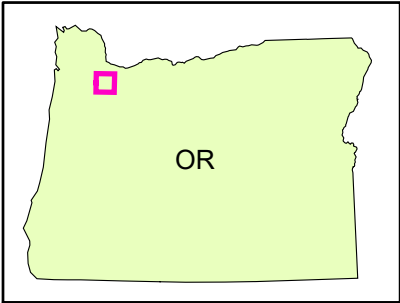
## **End of Report**

# WILLAMETTE RIVER AT WILSONVILLE

## OREGON



Overview



OR1802-CM-T

GC11424