

Memorandum

DATE: June 30, 2023
TO: The Siskiyou County Board of Supervisors
FROM: Chelsea Murphy, CKM Environmental
SUBJECT: Klamath Dam Removal Project – Anticipated 100-year Floodplain

I. INTRODUCTION AND BACKGROUND

The County has received many questions from the public regarding the Klamath River floodplain. Based on information from the California State Water Resources Control Board (SWRCB) Final Environmental Impact Report (FEIR) the floodplain maps for the “new” floodplain are based on anticipated and estimated changes to the floodplain following dam removal. To evaluate the impacts on the Klamath floodplain, the SWRCB in the FEIR and the Federal Energy Regulatory Commission (FERC) in the Final Environmental Impact Statement (FEIS)¹ utilized hydrologic and hydraulic modeling to estimate the changes in the 100-year Federal Emergency Management Agency (FEMA) floodplain. This modeling effort is not the final FEMA 100-year floodplain.

It is the County’s understanding through review of the environmental documentation that the new 100-year floodplain will not be established by FEMA until after dam removal and restoration activities related to removal are completed. As described in Volume I of the FEIR *Potential Impact 3.6-3*, the final determination of the extent of the future 100-year floodplain following dam removal would be made by FEMA (pages 3-630 to 3-633). According to the FEIR, the KRRRC is planning to coordinate with Siskiyou County and FEMA to initiate the map revision process (Volume III page 2-106). The definitions of FEMA Flood Zone Designations can be found [here](#), and the mapping process in which FEMA uses to define Flood Zones can be found [here](#).

The modeled 100-year floodplain inundation used in the environmental documents was completed by the United States Bureau of Reclamation (BOR) in 2012 and updated in the 2018 Draft EIR (DEIR) by Stillwater Sciences using a flood frequency analysis with the most recently (then 2017) published USGS streamflow data (DEIR Table 3.6-11, page 3-622). This analysis was used to support the hydrologic and hydraulic modeling of 100-year floodplain inundation, which is presented in Appendix K of the DEIR as modeled floodplain maps (2018) (Attachment A). The 2012 BOR floodplain modeling of floodplain inundation shows that removal of the Lower Klamath Project dams could alter the 100-year floodplain inundation

¹ The SWRCB’s FEIR is titled “Lower Klamath Project License Surrender Final Environmental Impact Report” and FERC’s FEIS is titled “Final Environmental Impact Statement for Hydropower License Surrender and Decommissioning – Lower Klamath Project – FERC Project No. 14803-001 and Klamath Hydroelectric Project – FERC Project No. 2082-063, Oregon and California”.

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area downstream of Iron Gate Dam between river mile (RM) 193 and 174 (i.e., from Iron Gate Dam to Humbug Creek) (USBR 2012). Both lead agencies (SWRBC and FERC) recognize that “Sediment deposition may also result in streambed aggradation² that would result in changes to the 100-year floodplain” (page 3-542 of the Final Environmental Impact Statement [FEIS]). Throughout the FEIS, FERC notes that “Streambed aggradation could result in changes to the 100-year floodplain in the first 10 to 20 miles downstream from the Iron Gate Dam site” (page 3-602; page 4-4; etc.).

As stated in the Draft EIR, the BOR models estimated that the discharge of the 100-year peak flood immediately downstream of Iron Gate Dam would increase by up to seven percent following dam removal (Table 3.6-12) and flood peaks would occur about 10 hours earlier. This increased discharge would result in flood elevations that are 1.65 feet higher on average from Iron Gate Dam (RM 193) to Bogus Creek (RM 192.6) and 1.51 feet higher on average from Bogus Creek to Willow Creek (RM 188). The impact of dam removal on flood peak elevations would decrease with distance downstream of Iron Gate Dam, and the BOR and KRRC estimated that there would be no significant effect on flood elevations downstream of Humbug Creek (RM 174) because flow attenuation would occur in the mainstem channel and tributary peak flows would not coincide with the peak flow downstream of RM 193 (i.e., current location of Iron Gate Dam) (DEIR, page 3-630).

II. CONCLUSION

Despite all the modeling, the newly established flood zones (including the 100-year) will be established by FEMA after dam removal and restoration is completed. This is because sediment transport and deposition will occur naturally after removal, and grading work conducted during restoration of the reservoirs may alter the Klamath River floodplain. Therefore, the new floodplain will likely not be established until mid-to-late 2025. To better explain how the flood zone mapping process is completed, as well as how it will be done for the Klamath Dam Removal Project, the County will be inviting experts from FEMA to present at an upcoming Board meeting. Specific information regarding a date for this presentation will be shared with the Board and the public once available.

² Aggradation is a term used in geology for the increase in land elevation, typically in a river system, due to the deposition of sediment.



Appendix A.

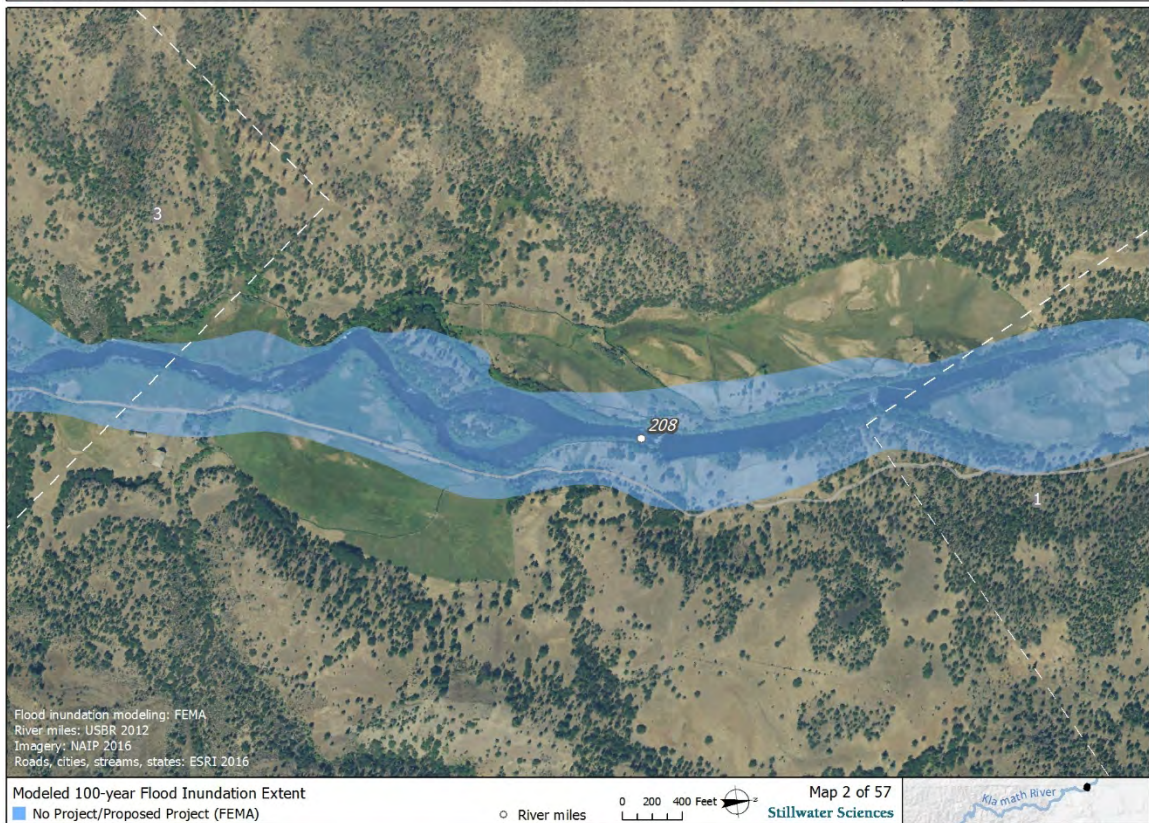
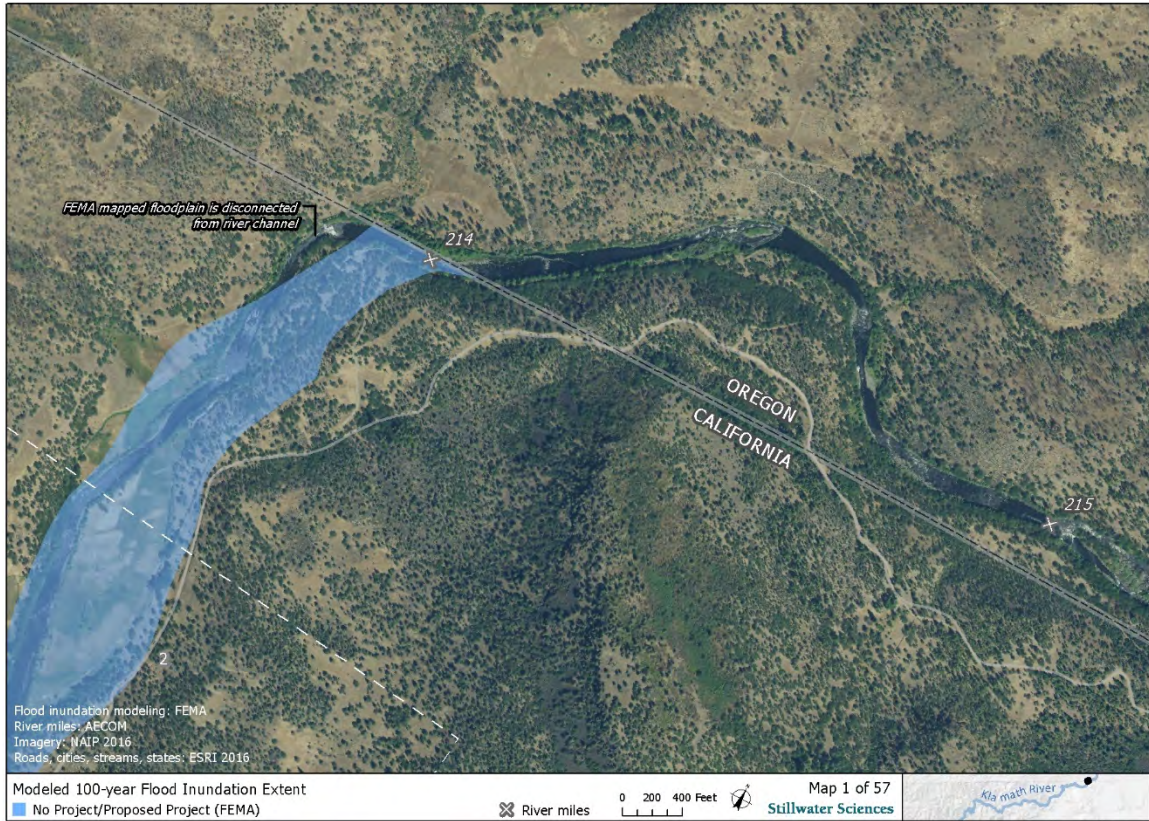
Flood Hydrology
Maps – Appendix K,
DEIR

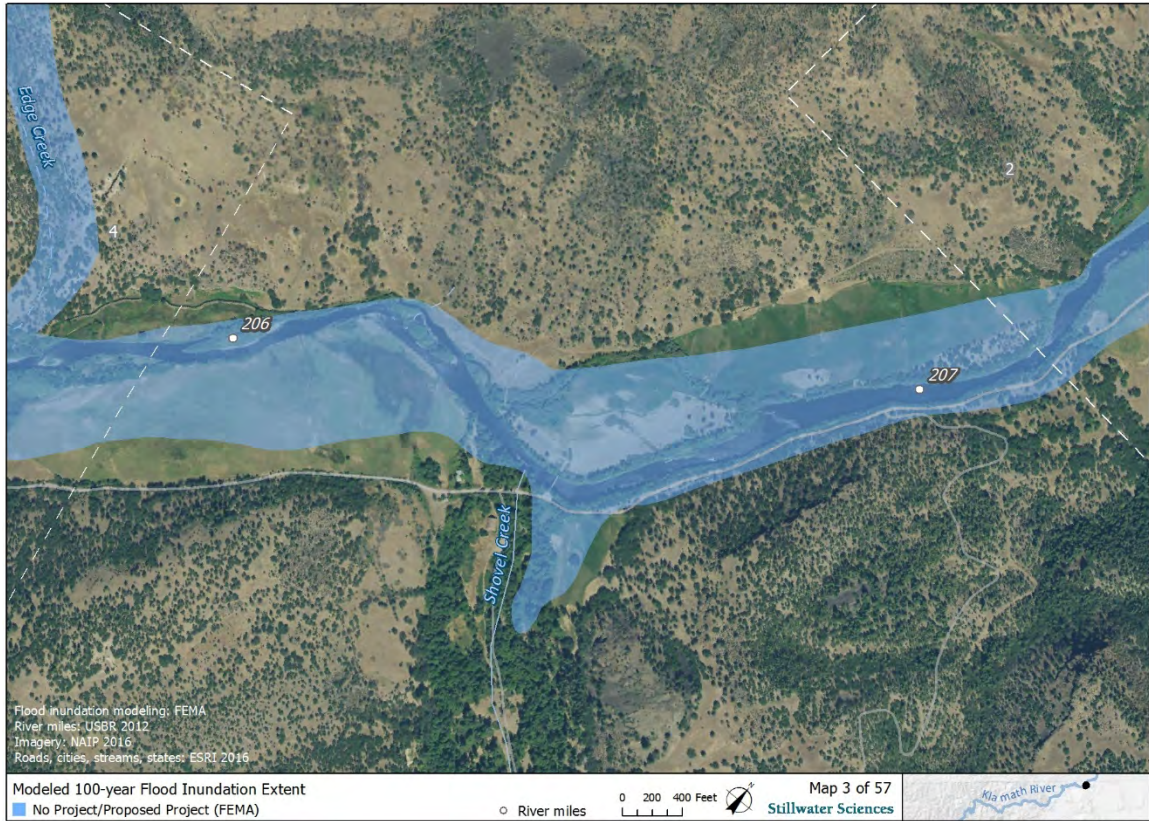
Appendix K
Flood Hydrology

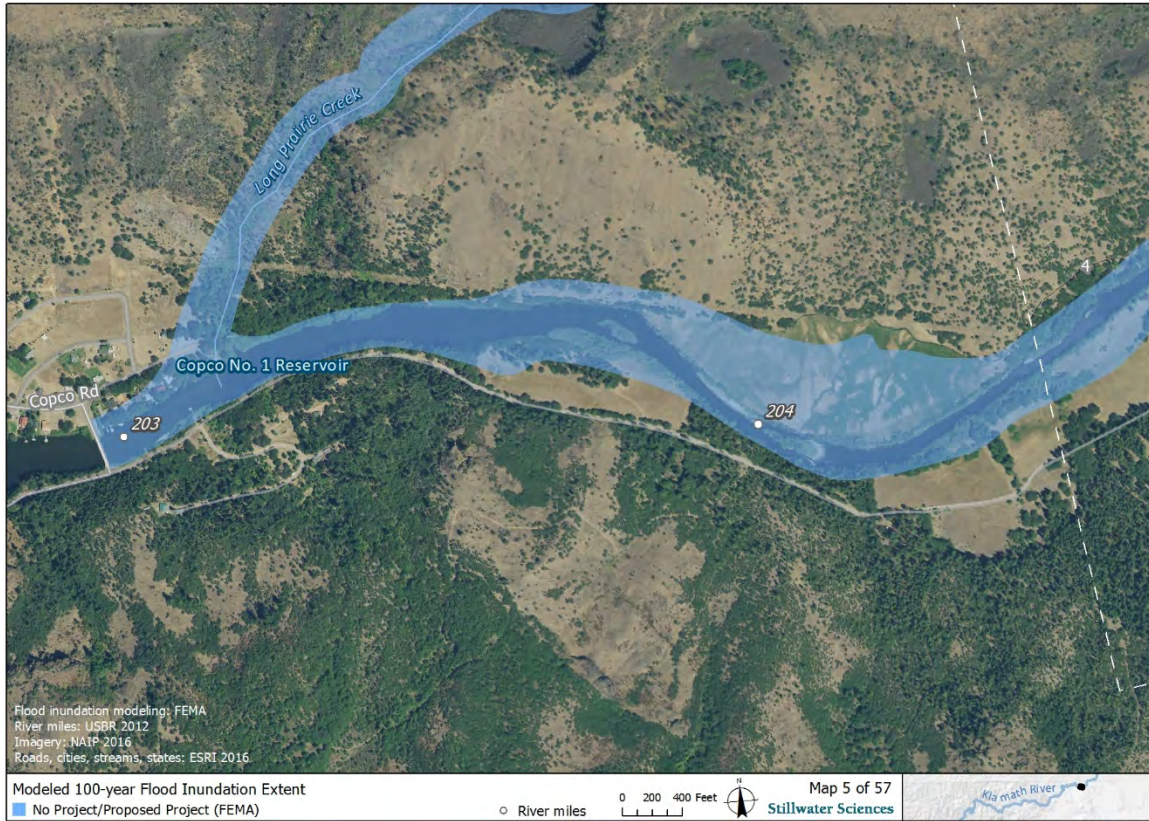
The following maps illustrate modeled 100-year flood inundation mapping conducted by FEMA (map tiles 1–5) and USBR (map tiles 6–57). USBR flood inundation mapping uses daily average flows under the two scenarios modeled in USBR (2012¹¹), including the Proposed Project (dams removal) and No Project (dams remain in place). The USBR modeling extends from Iron Gate Dam downstream to Happy Camp at approximately river mile 107. FEMA will make the final determination of the future 100-year floodplain after dam removal and the KRRC is coordinating with FEMA to initiate the map revision process.

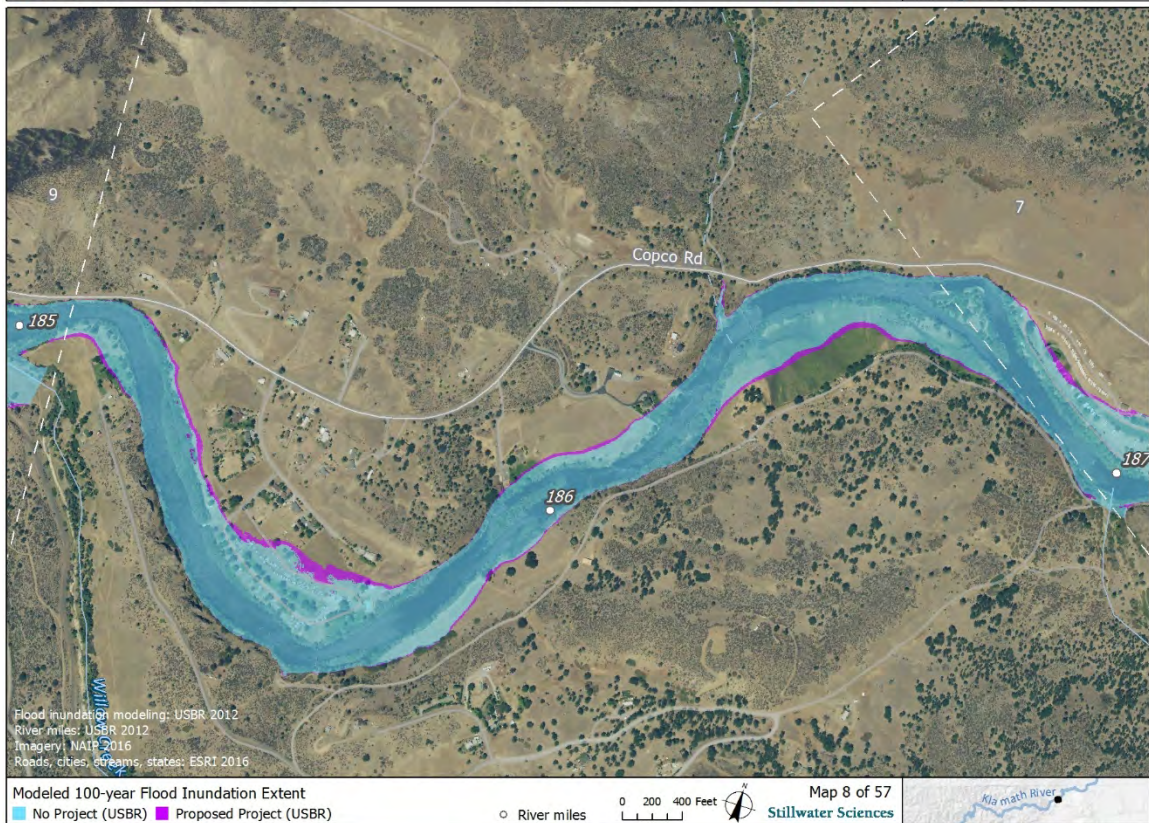
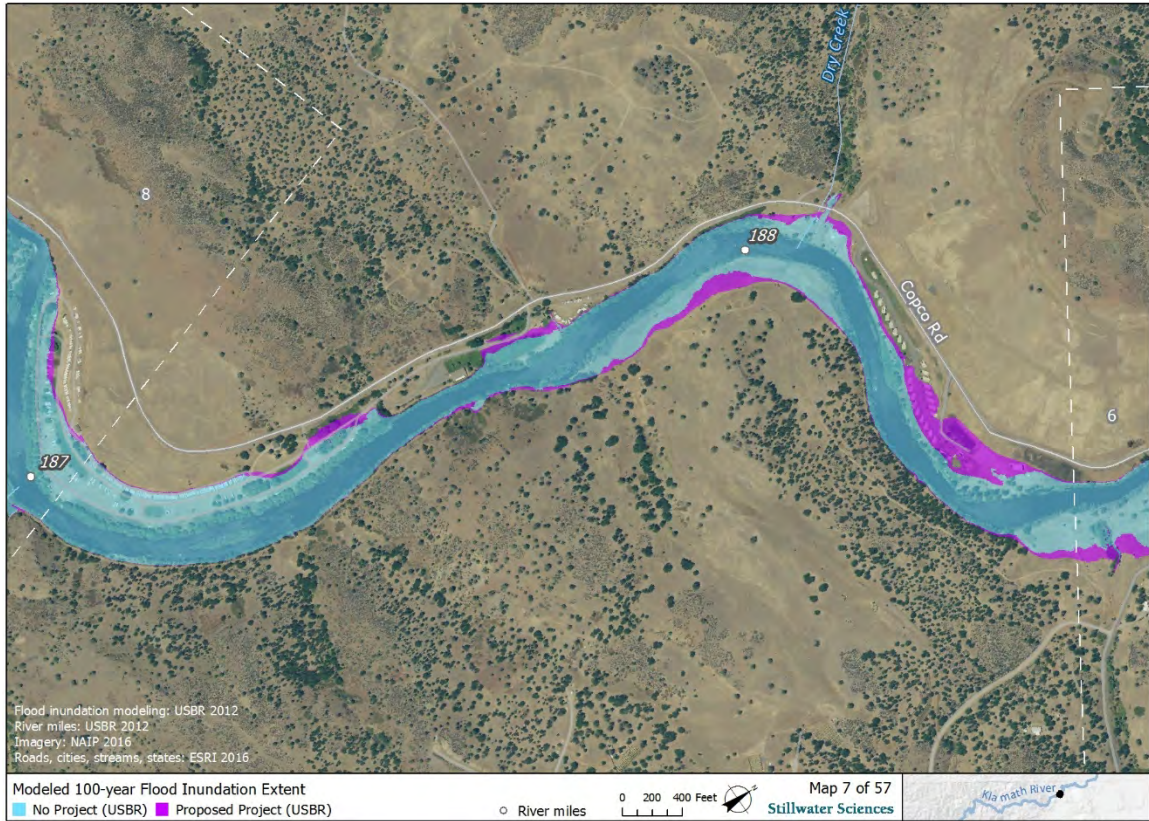
¹¹ USBR. 2012. Hydrology, Hydraulics, and Sediment Transport Studies for the Secretary's Determination on Klamath River Dam Removal and Basin Restoration. Technical Report No. SRH-2011-02. Prepared for Mid-Pacific Region, Bureau of Reclamation, Technical Service Center, Denver, Colorado.

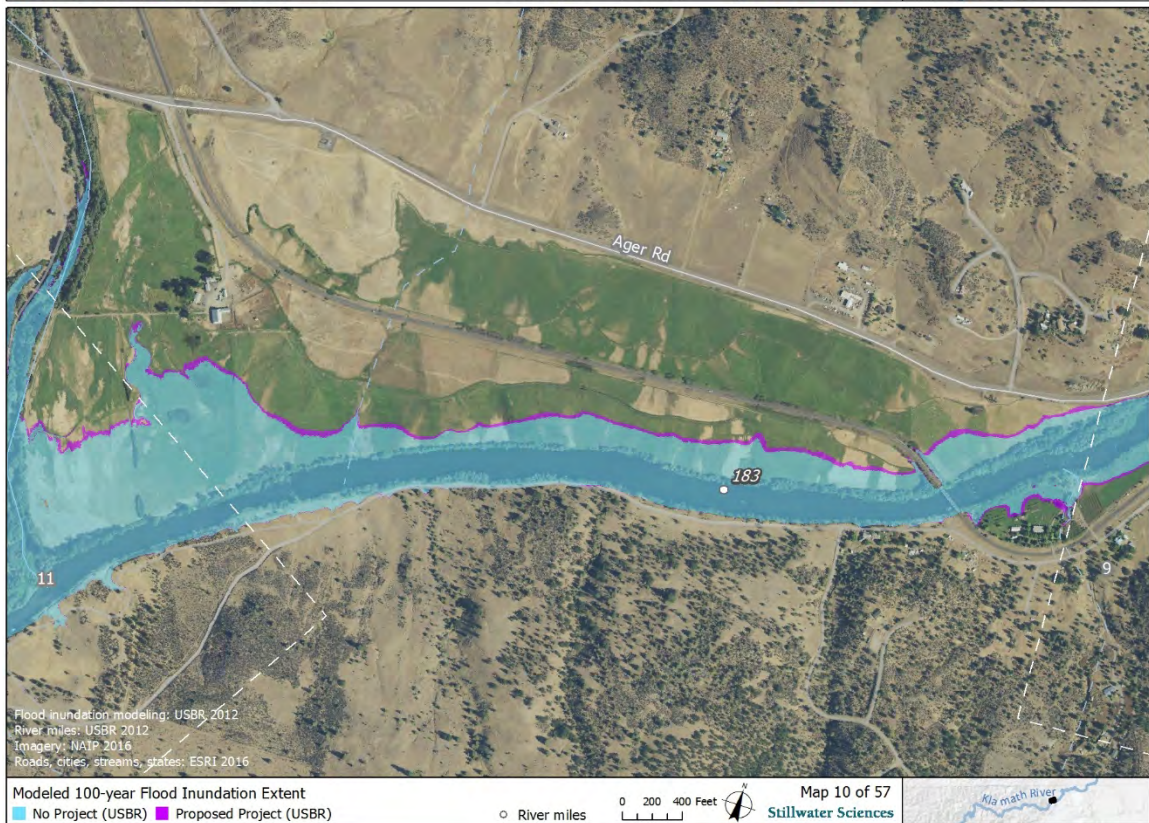
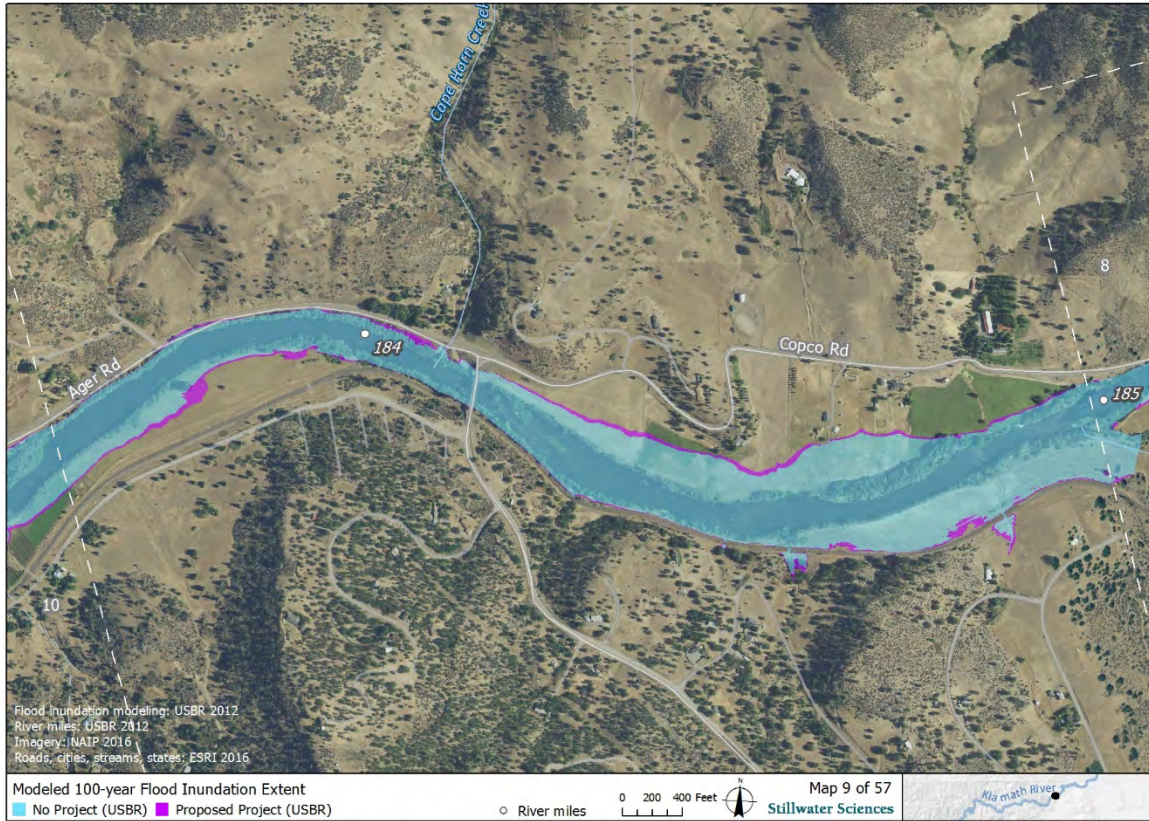


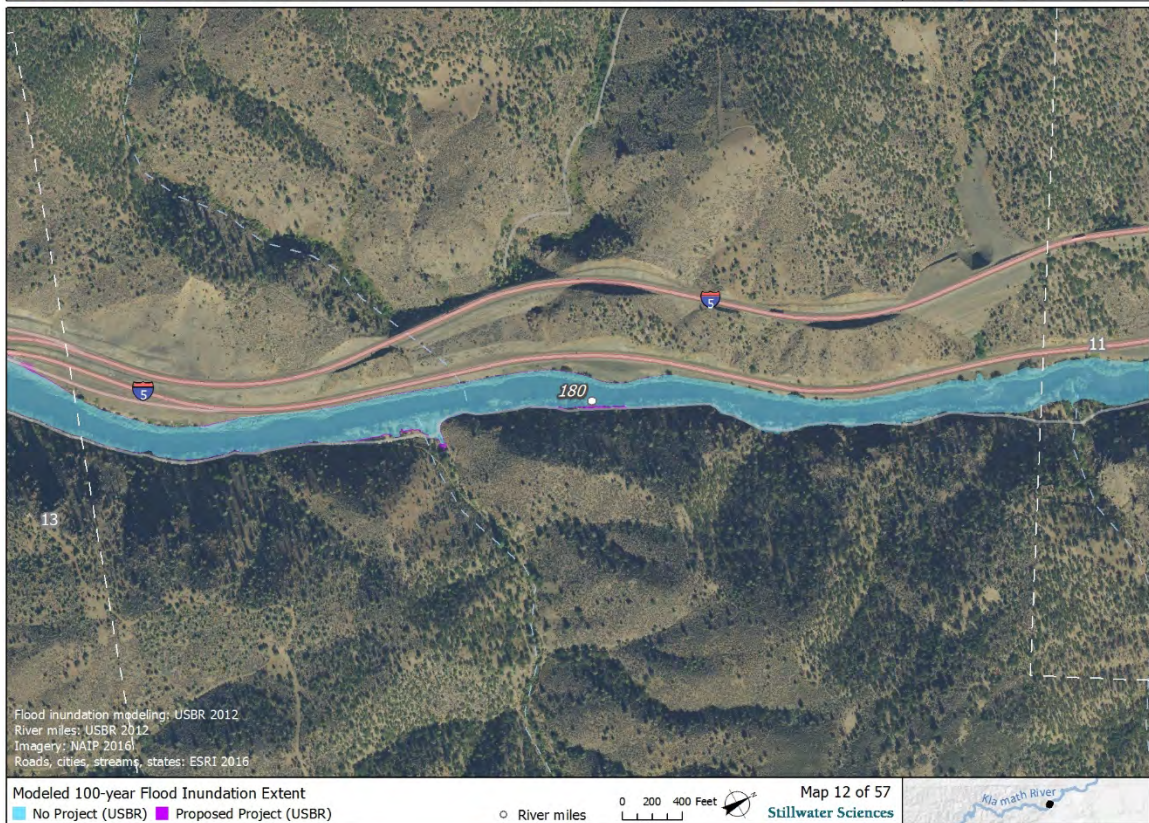
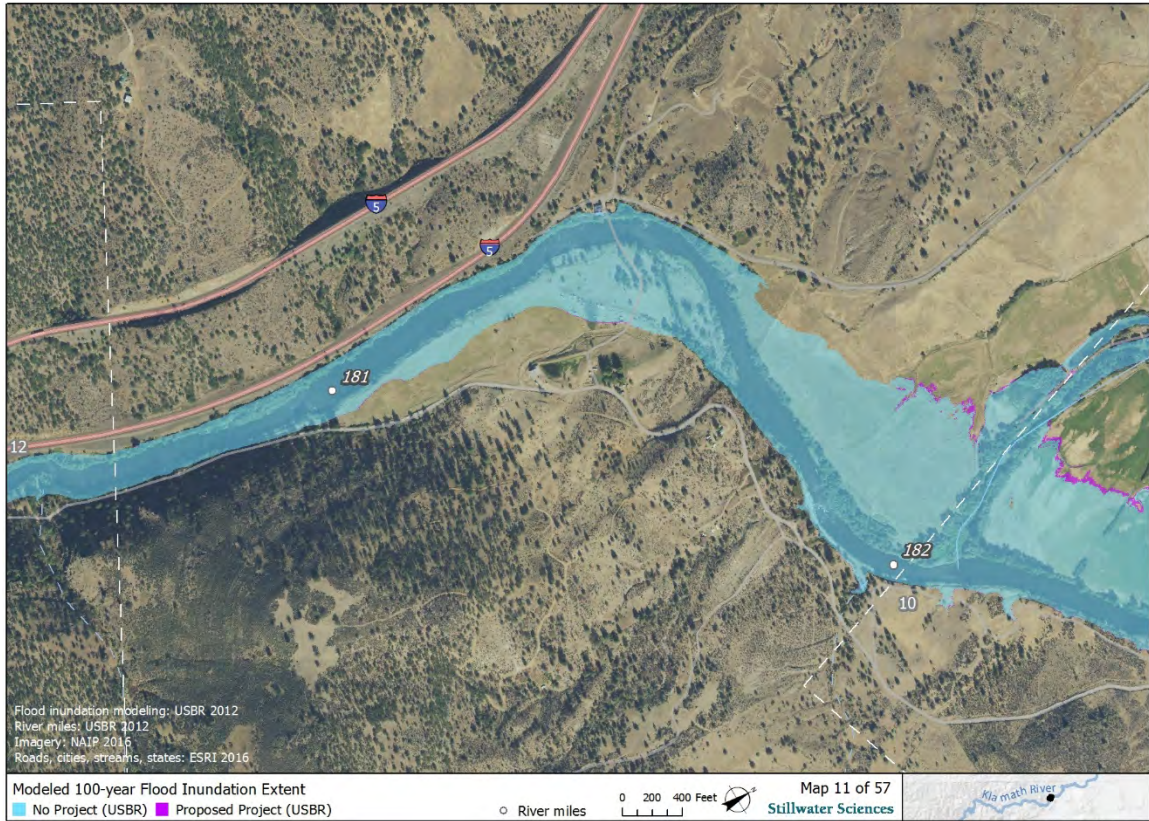


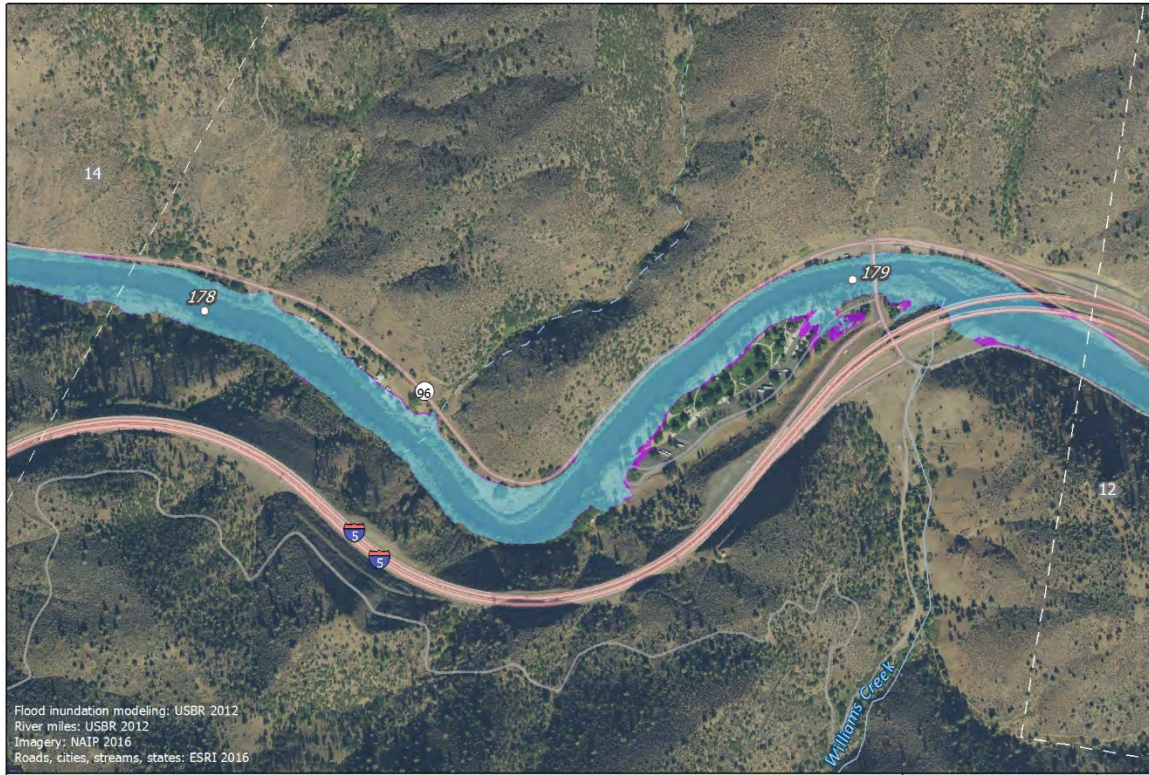








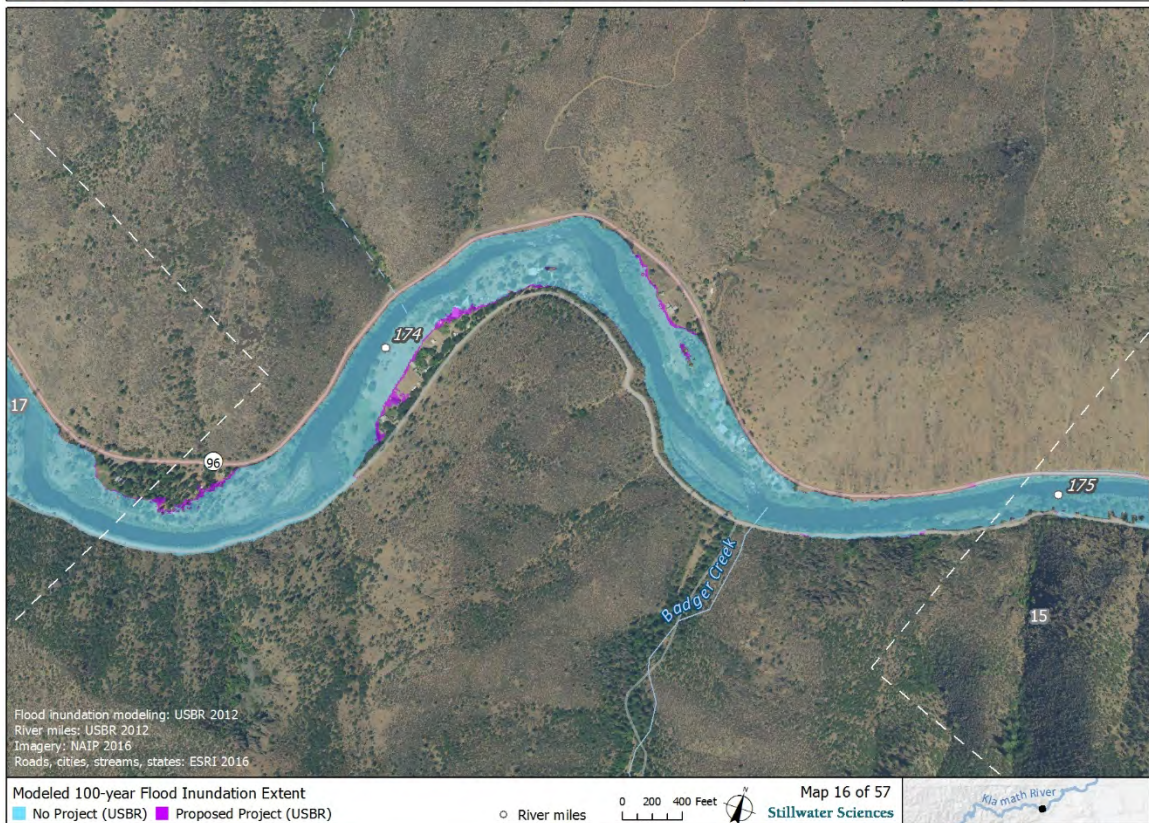


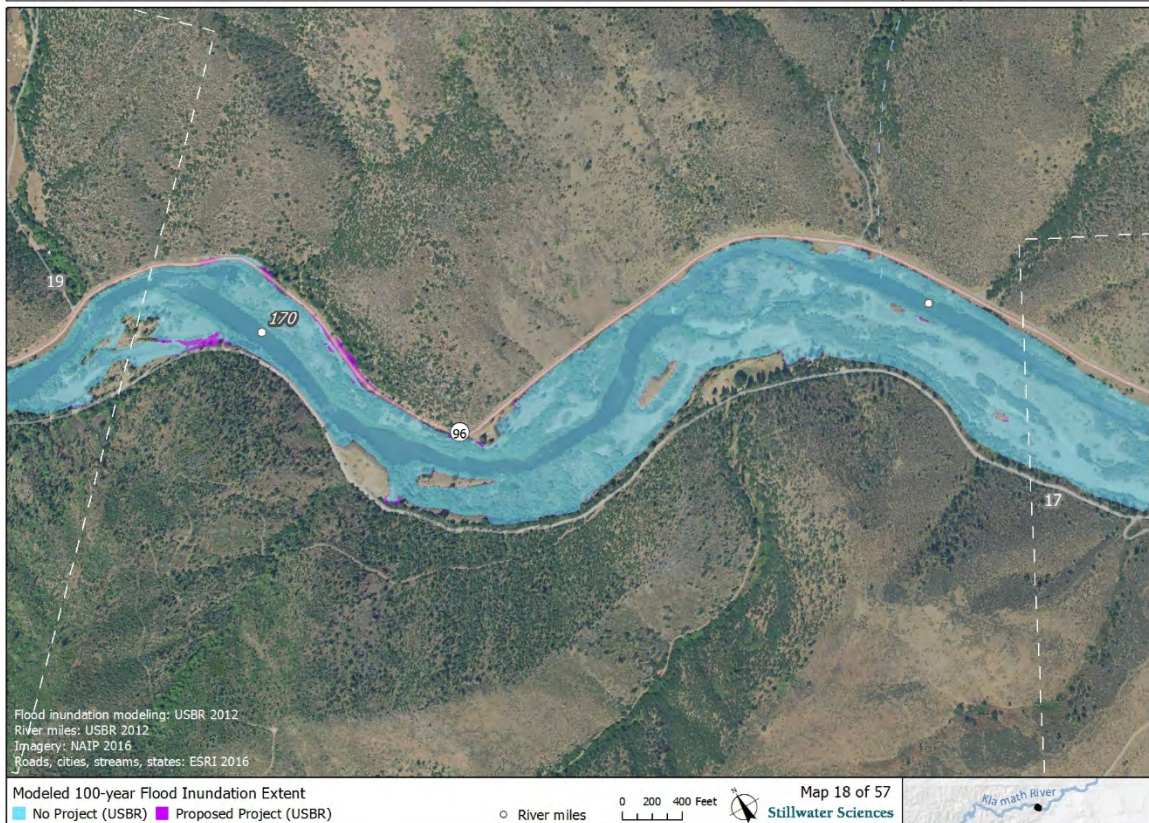


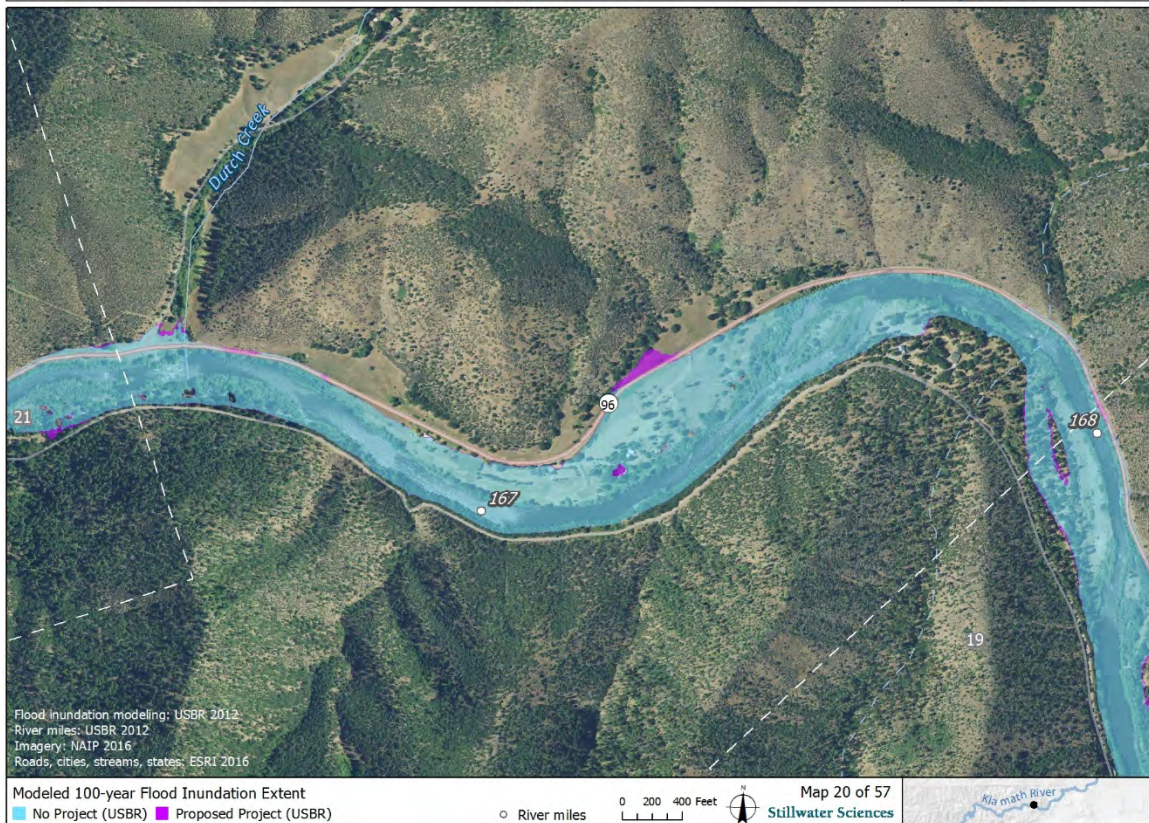
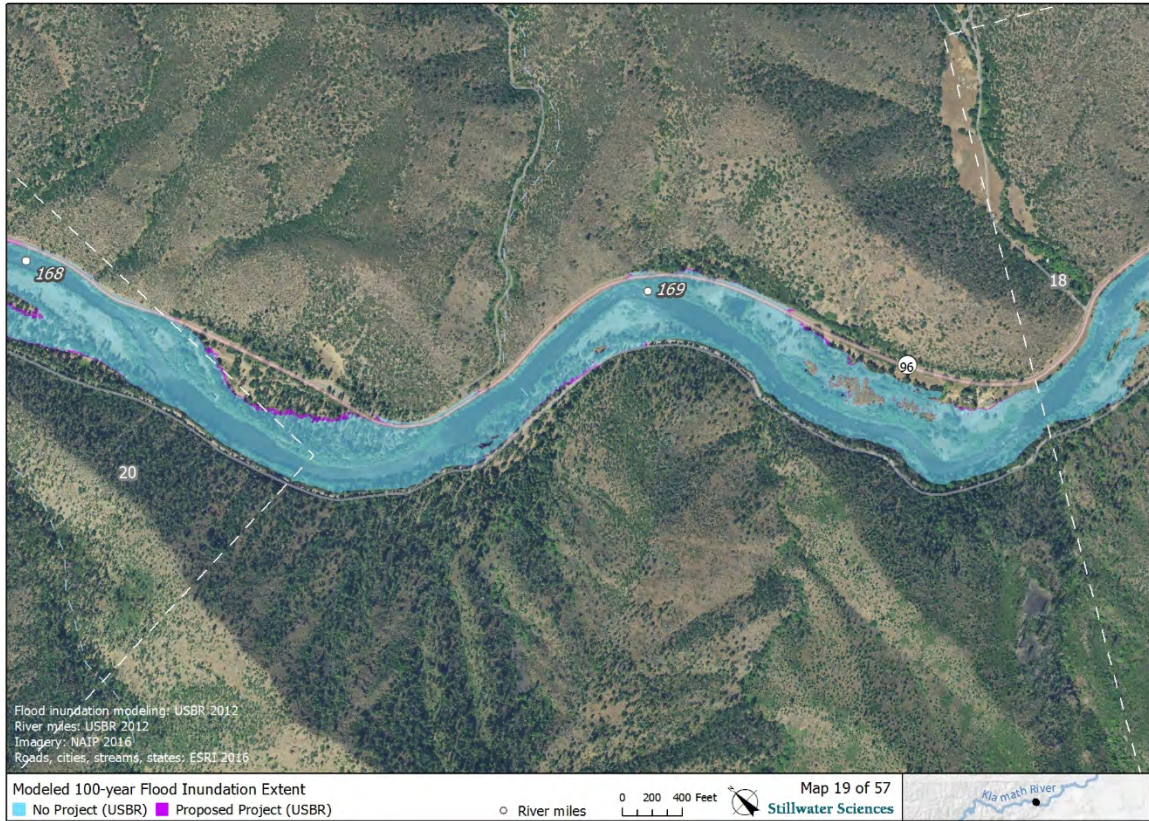
Modeled 100-year Flood Inundation Extent
No Project (USBR) Proposed Project (USBR)
River miles 0 200 400 Feet
Map 13 of 57
Stillwater Sciences



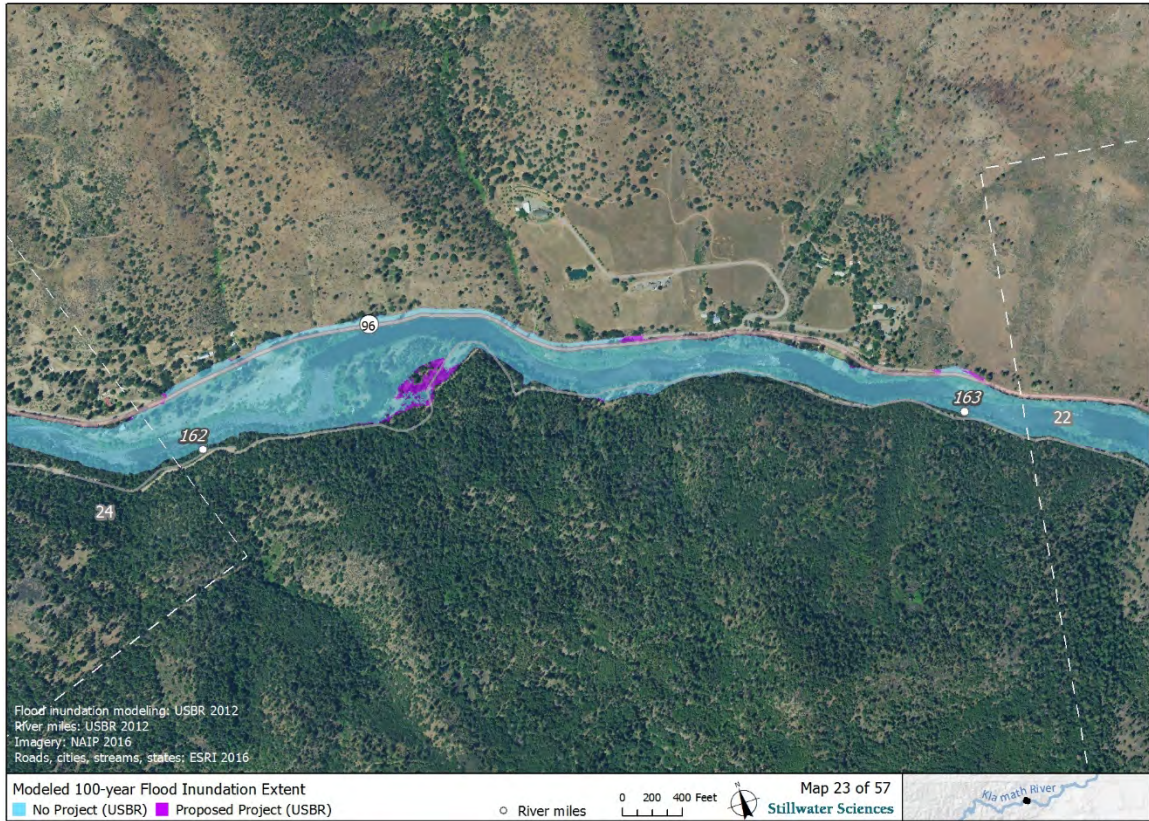
Modeled 100-year Flood Inundation Extent
No Project (USBR) Proposed Project (USBR)
River miles 0 200 400 Feet
Map 14 of 57
Stillwater Sciences









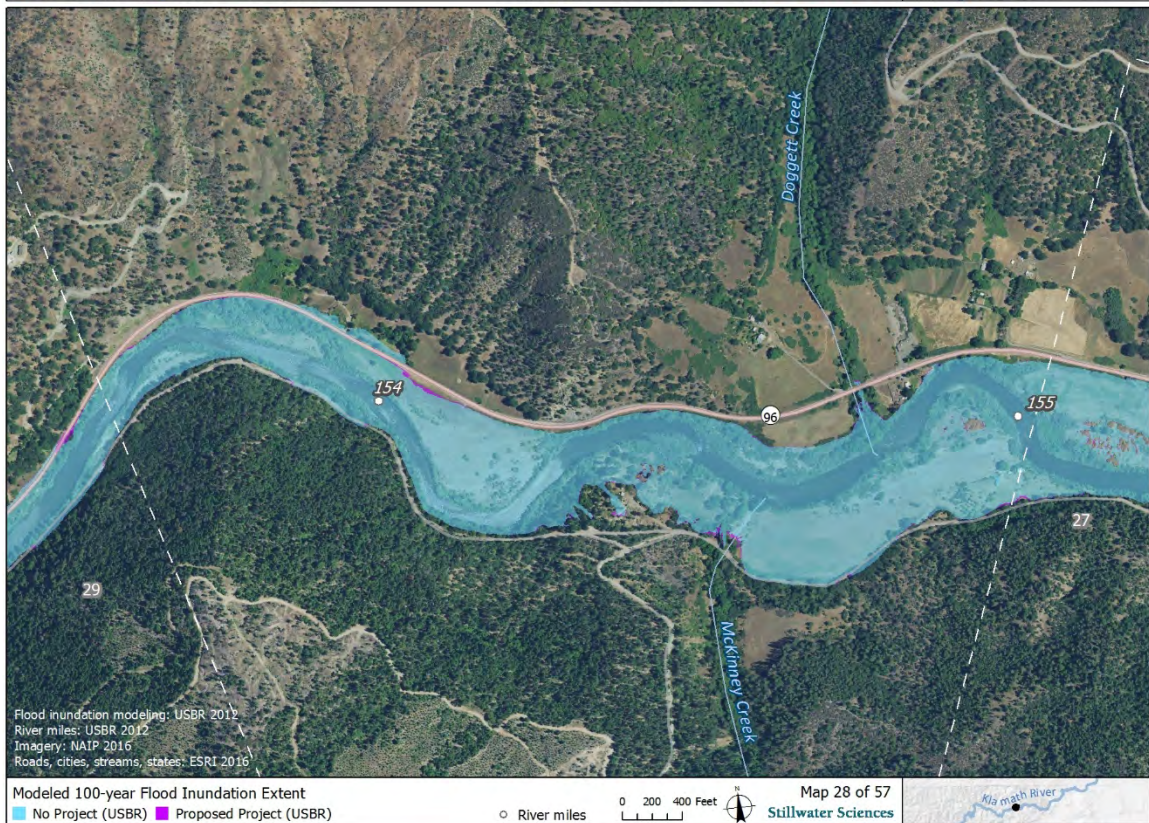
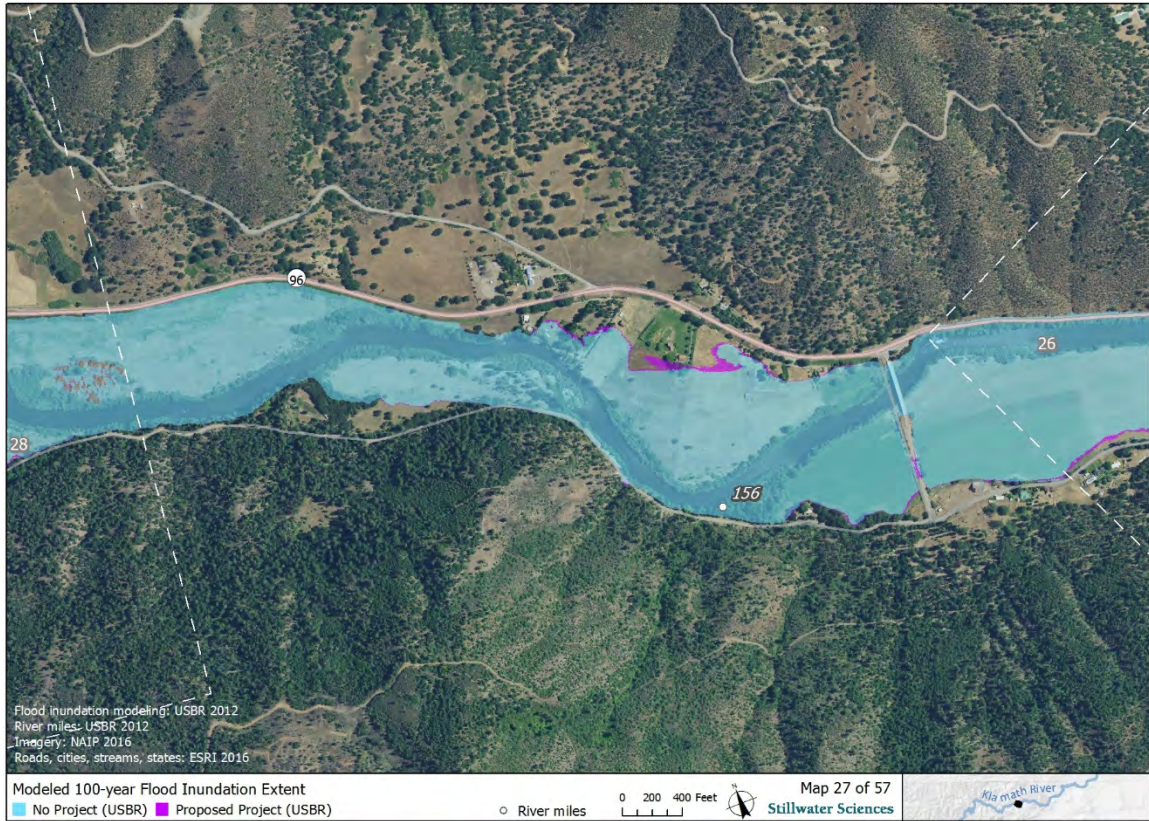




Modeled 100-year Flood Inundation Extent
No Project (USBR) Proposed Project (USBR)
River miles 0 200 400 Feet
Map 25 of 57
Stillwater Sciences
Klamath River



Modeled 100-year Flood Inundation Extent
No Project (USBR) Proposed Project (USBR)
River miles 0 200 400 Feet
Map 26 of 57
Stillwater Sciences
Klamath River

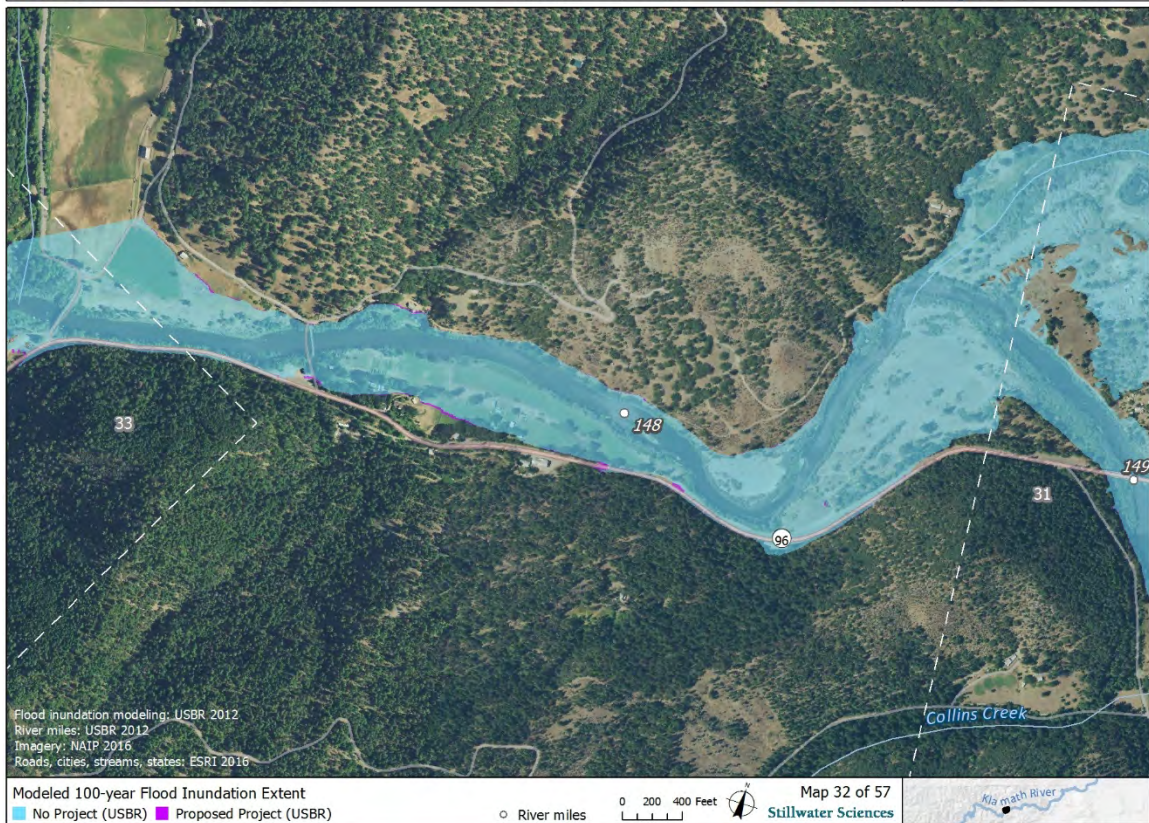
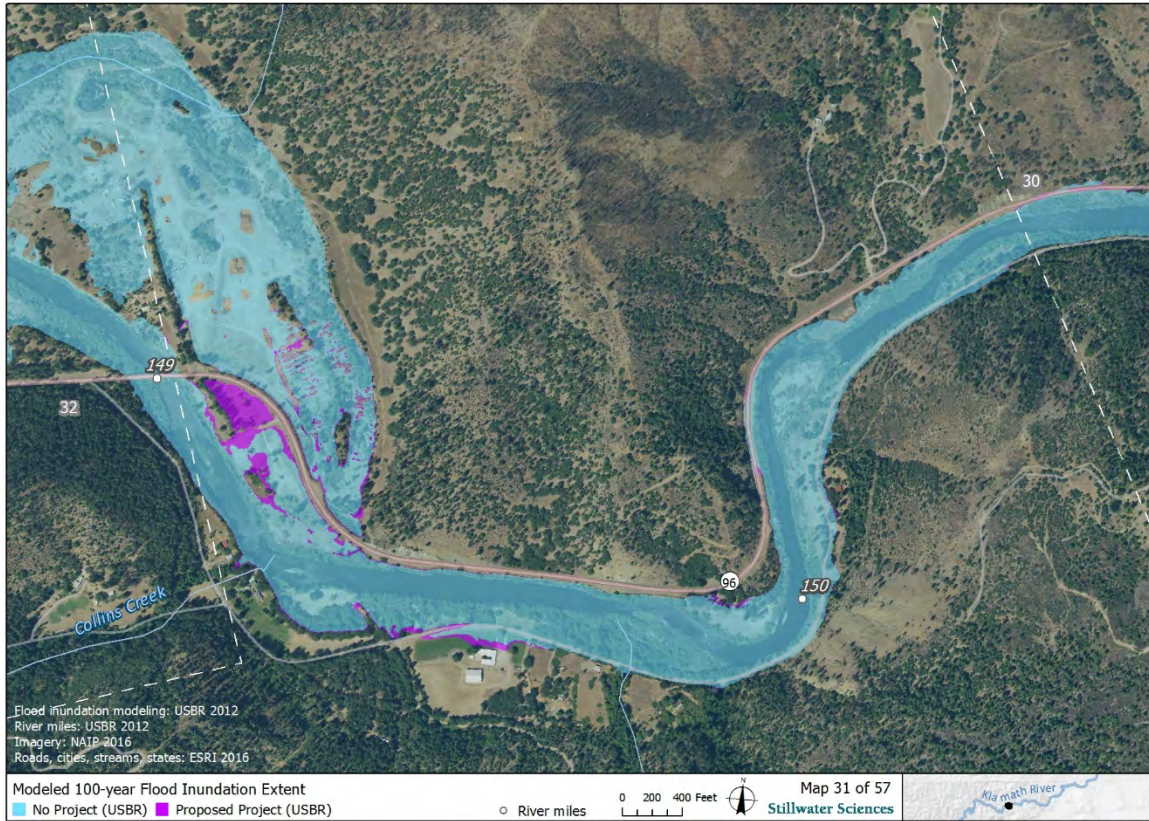


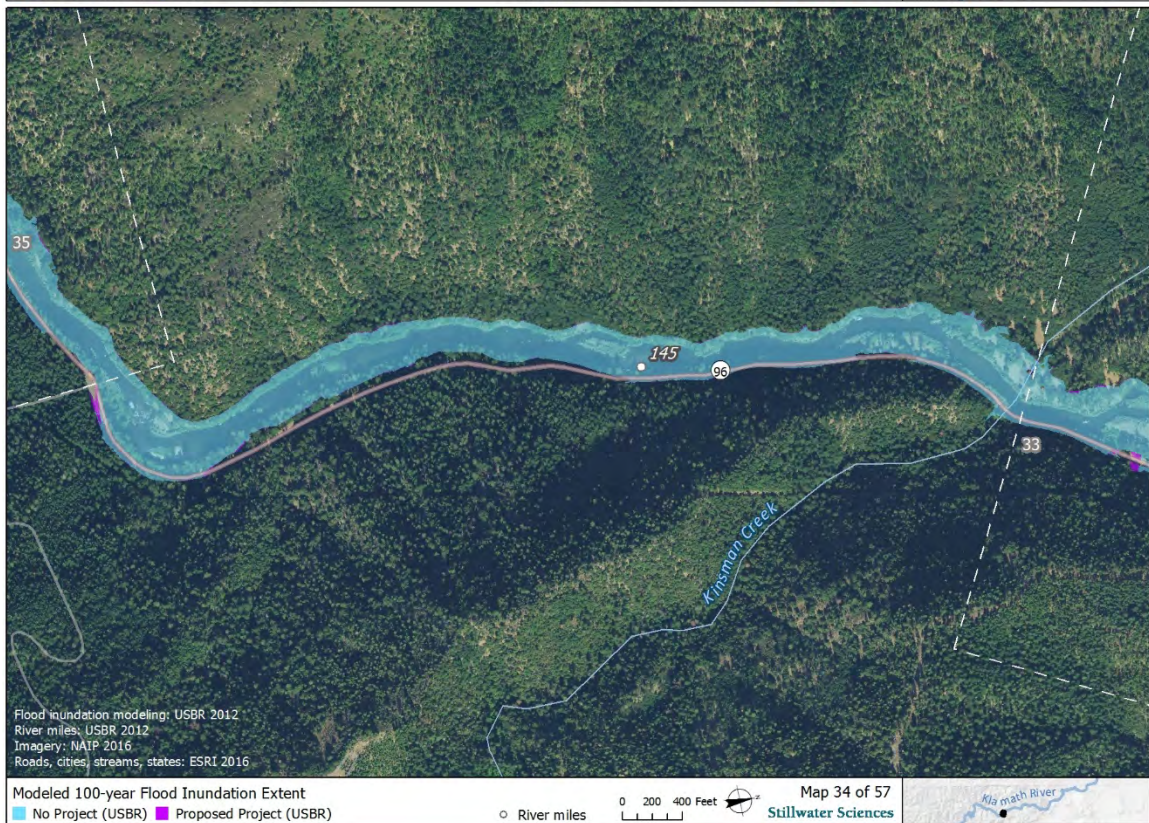
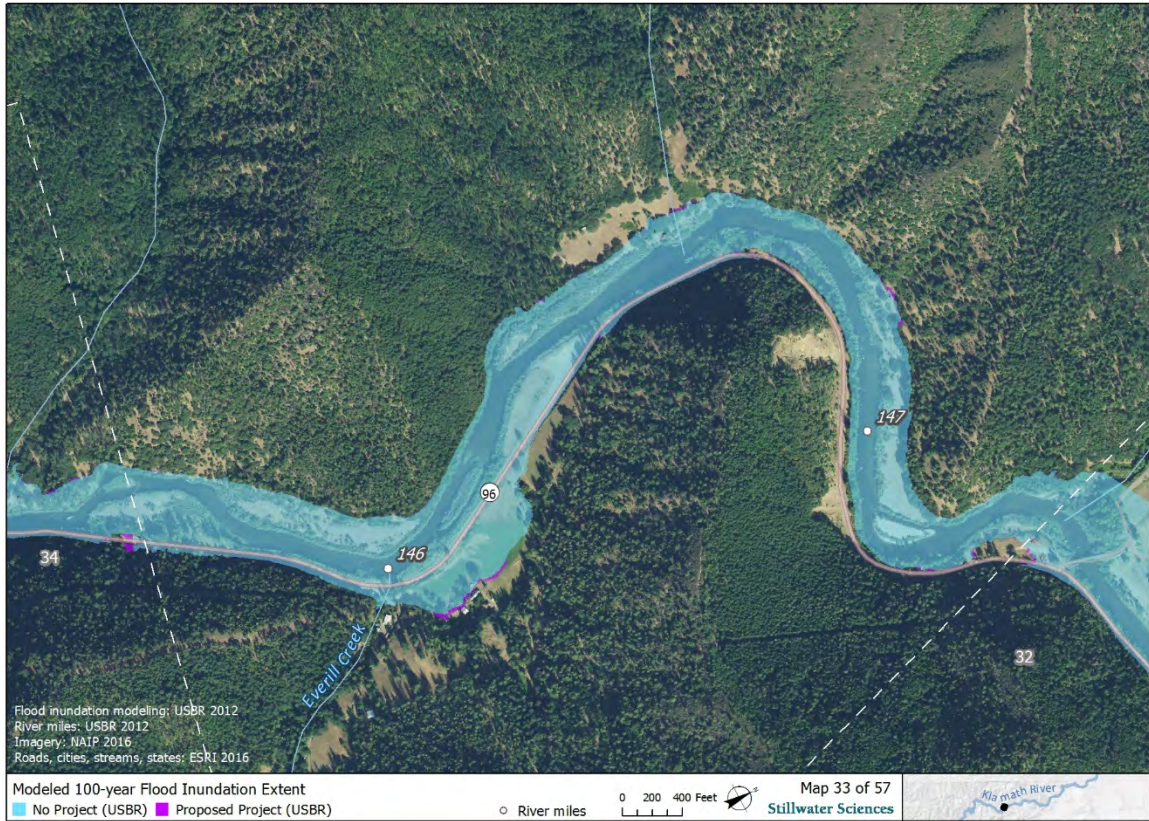


Modeled 100-year Flood Inundation Extent
No Project (USBR) Proposed Project (USBR)
River miles 0 200 400 Feet
Map 29 of 57
Stillwater Sciences



Modeled 100-year Flood Inundation Extent
No Project (USBR) Proposed Project (USBR)
River miles 0 200 400 Feet
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Stillwater Sciences







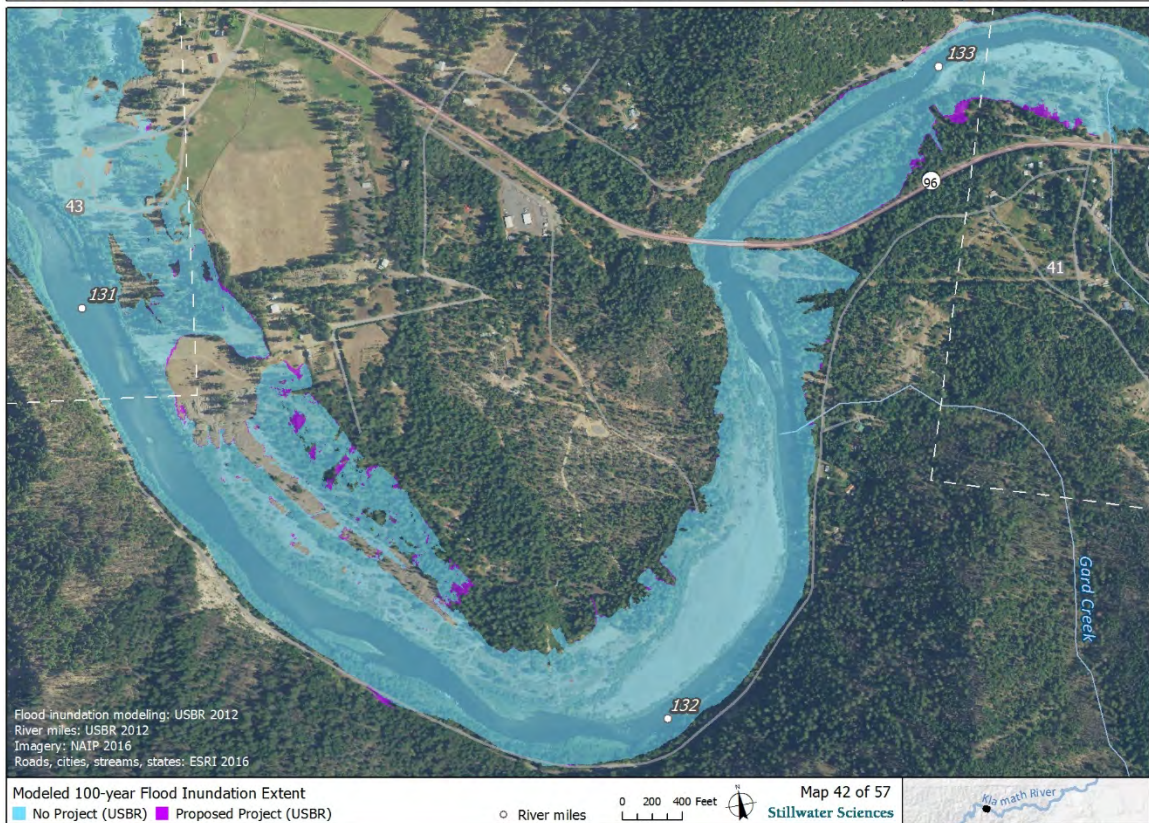


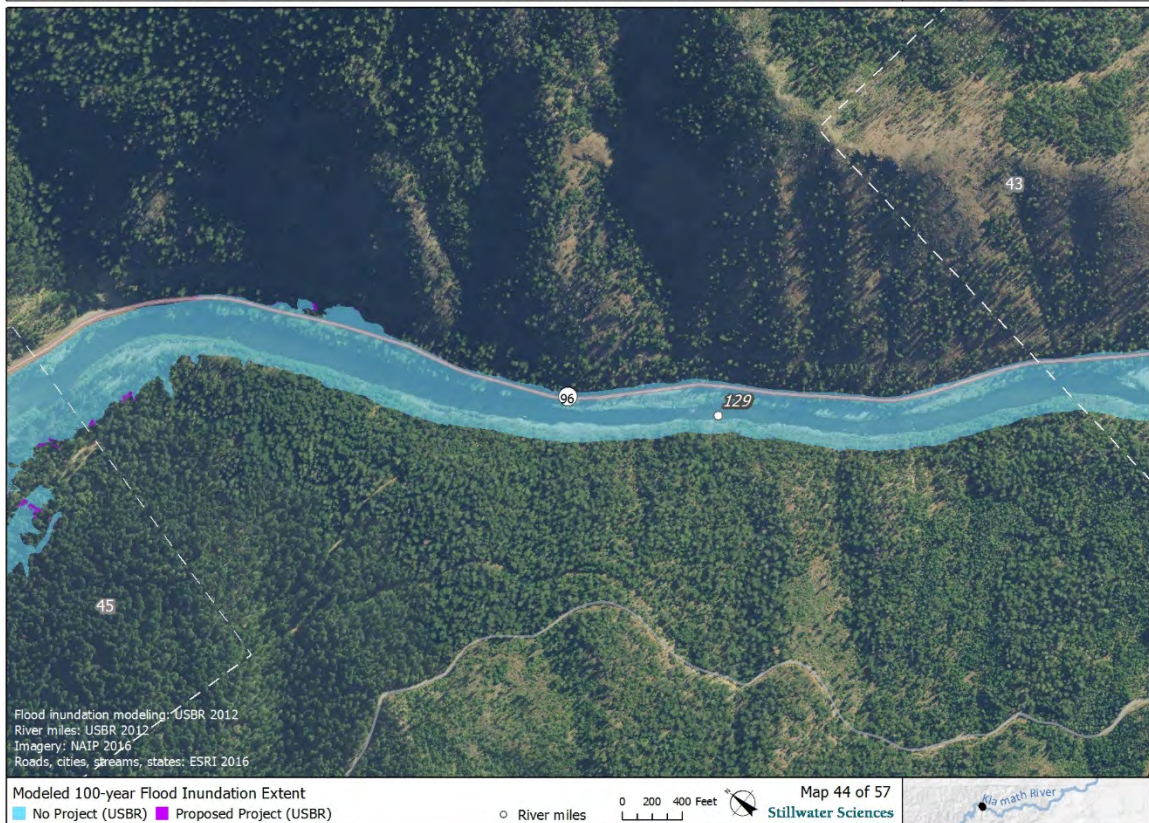
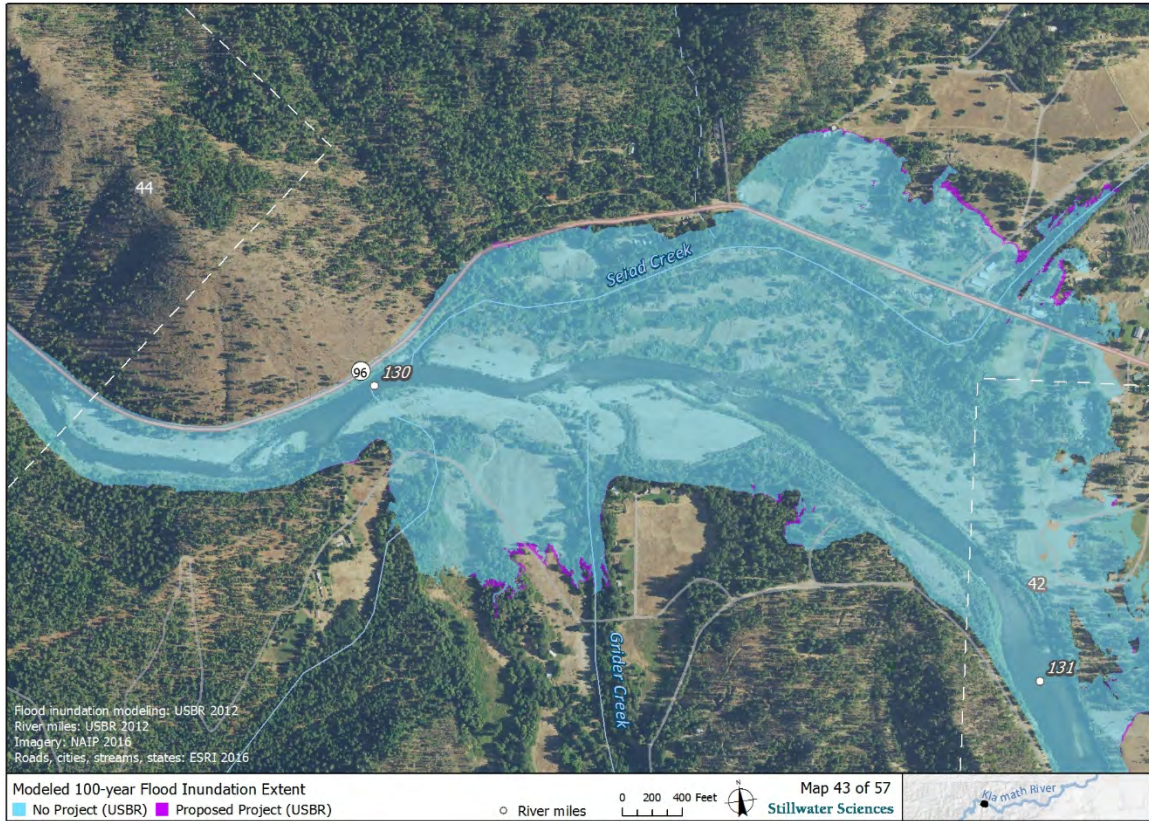


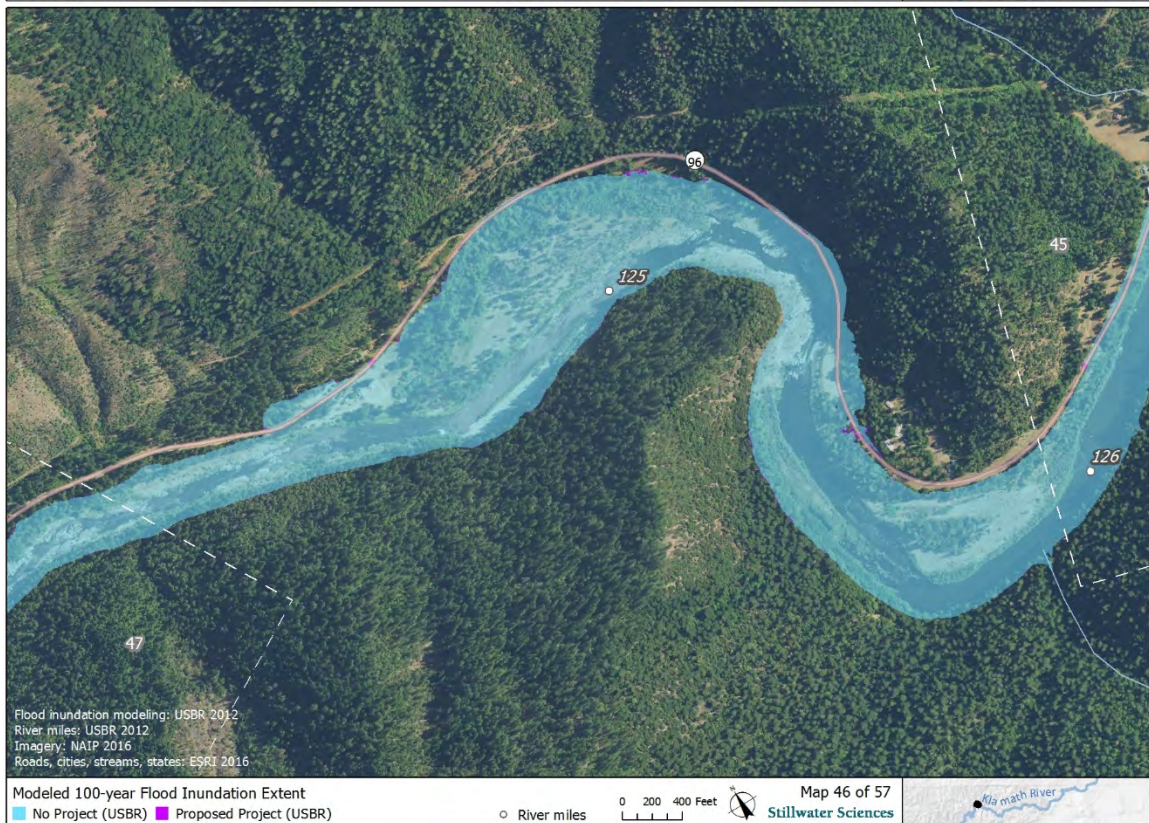
Modeled 100-year Flood Inundation Extent
No Project (USBR) Proposed Project (USBR)
River miles 0 200 400 Feet
Map 39 of 57
Stillwater Sciences
Klamath River

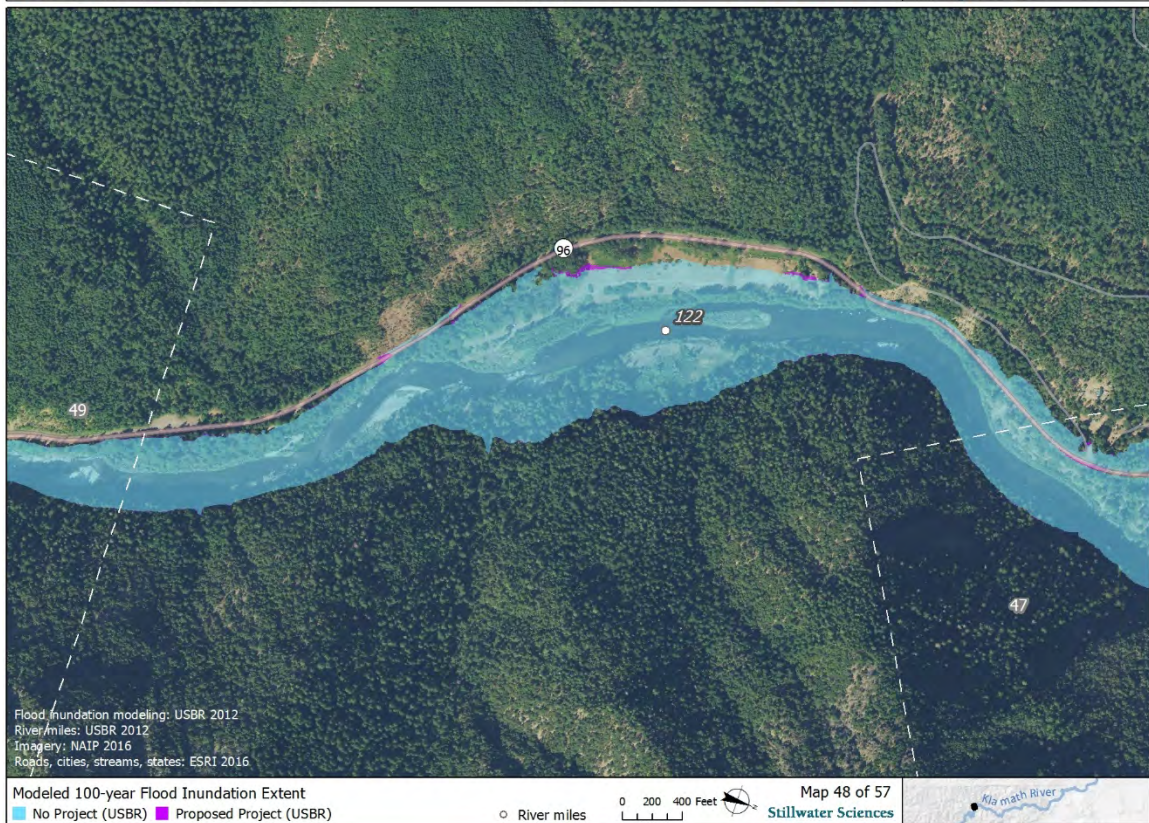


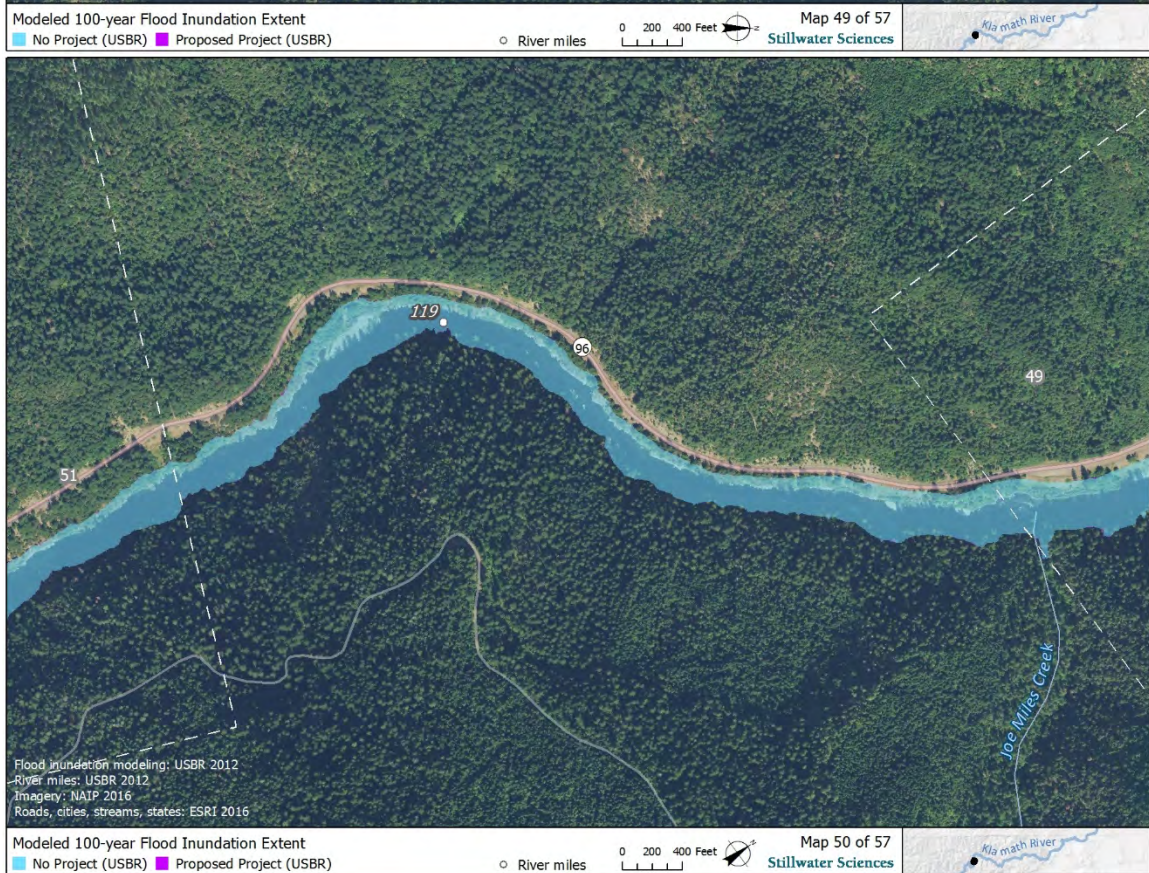
Modeled 100-year Flood Inundation Extent
No Project (USBR) Proposed Project (USBR)
River miles 0 200 400 Feet
Map 40 of 57
Stillwater Sciences
Klamath River









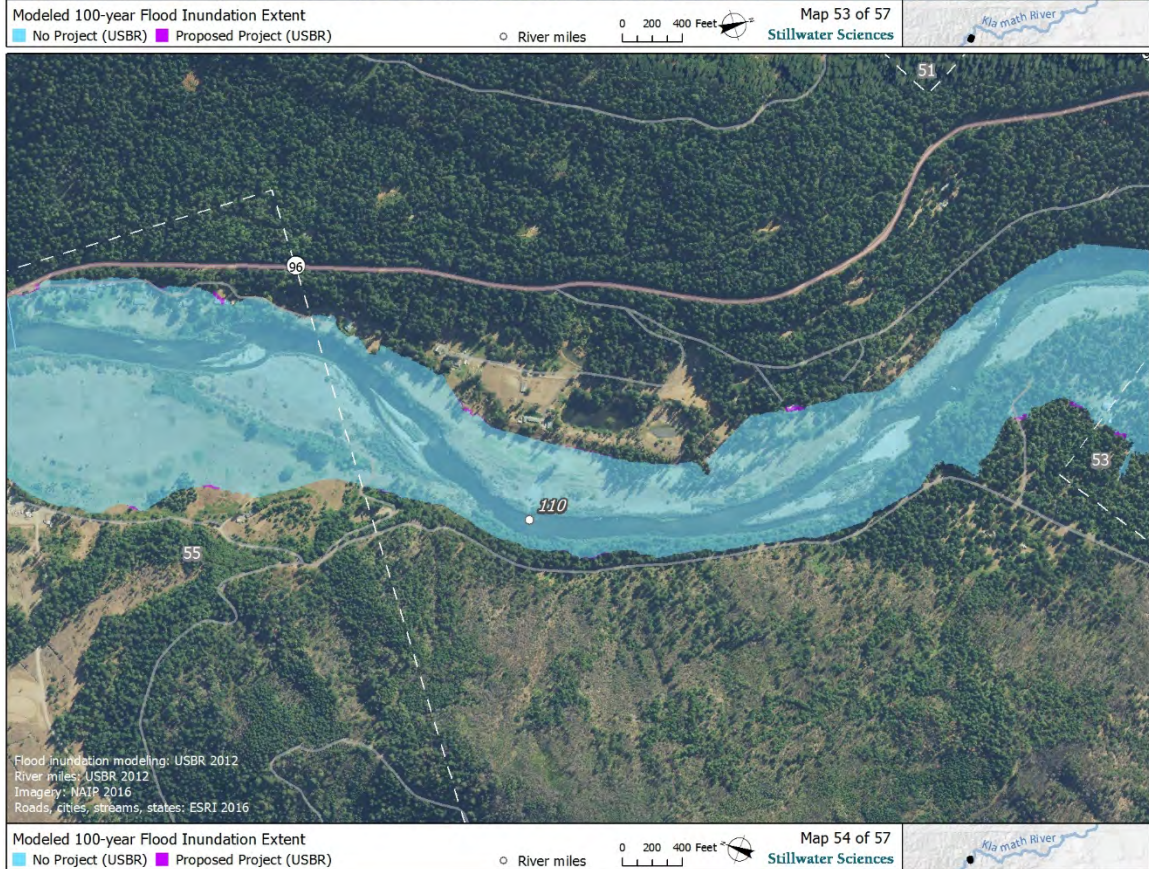
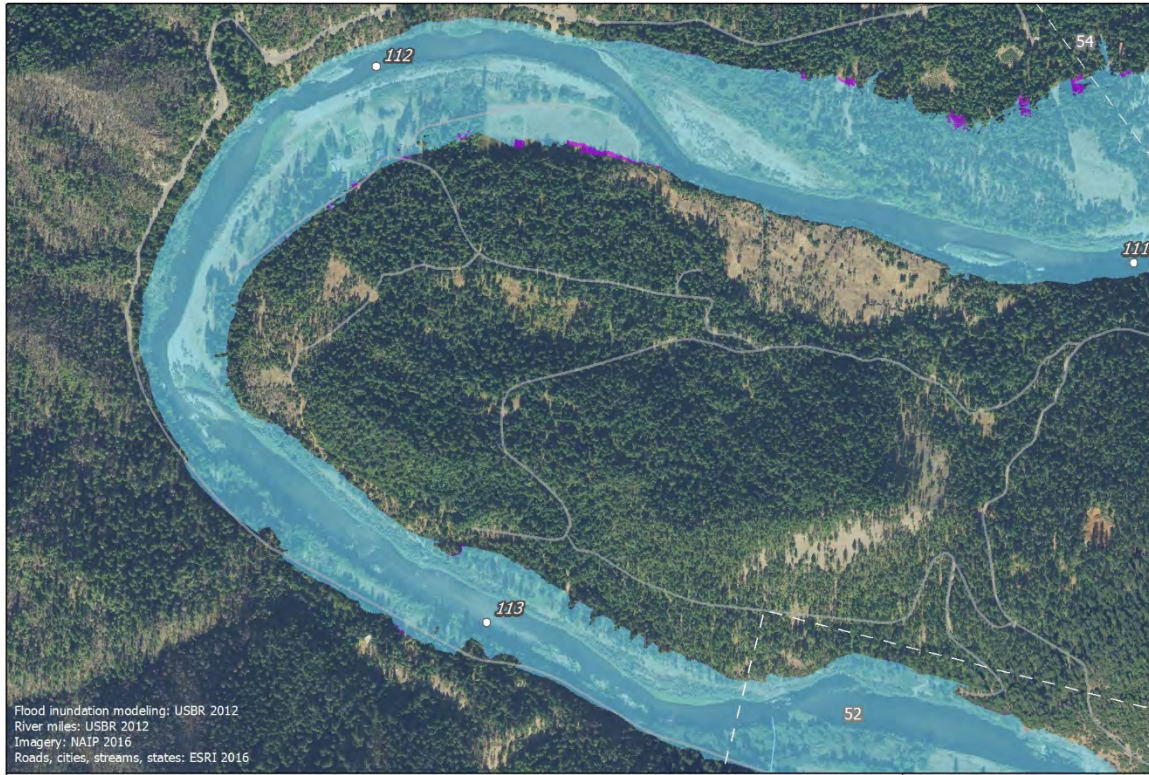


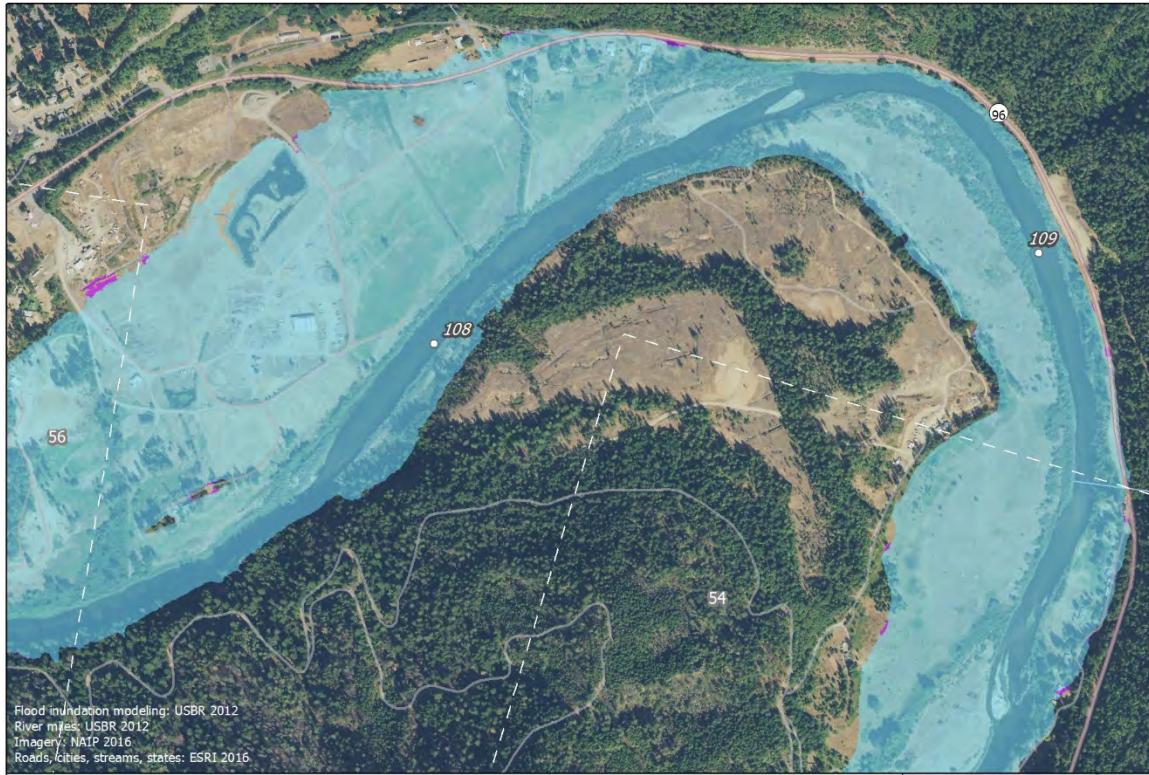


Modeled 100-year Flood Inundation Extent
No Project (USBR) Proposed Project (USBR)
River miles 0 200 400 Feet
Map 51 of 57
Stillwater Sciences
Klamath River



Modeled 100-year Flood Inundation Extent
No Project (USBR) Proposed Project (USBR)
River miles 0 200 400 Feet
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Stillwater Sciences
Klamath River





Modeled 100-year Flood Inundation Extent
No Project (USBR) Proposed Project (USBR)
River miles 0 200 400 Feet
Map 55 of 57
Stillwater Sciences
Klamath River



Modeled 100-year Flood Inundation Extent
No Project (USBR) Proposed Project (USBR)
River miles 0 200 400 Feet
Map 56 of 57
Stillwater Sciences
Klamath River

