

## Appendix A: WNMF Area Mapping

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We visited two known wet, non-farmable, and marginally farmable (WNMF) areas on Bacon and Bouldin islands in July 2012 and July 2011, respectively. [Figures A1](#) and [A2](#) show photos of these WNMF areas. Our field observations show that near levees, WNMF areas are generally characterized by large areas of wetland vegetation and saturated soils which prevent agricultural operations.

To map the WNMF areas, we used historical Google Earth images from 1993 through 2011 at approximately 1-m resolution. We also examined historical aerial photos, color infrared National Aerial Photography Program (NAPP) images, and color infrared National High Altitude Photography (NHAP) images available from the U.S. Geological Survey (USGS) database for 1970, 1974, 1984, and 1987 (<http://earthexplorer.usgs.gov/>). The NAPP color infrared images are at a scale of 1:40,000, and the NHAP color infrared photos are at a scale of 1:58,000. [Figure A3](#) shows an example 1984 color infrared image of the WNMF area delineated on Bouldin Island.

By identifying the signature for WNMF areas based on images of known WNMF areas (such as Bacon and Bouldin), we searched for similar signatures in other locations and verified selected WNMF areas with landowners and growers. Specifically, we viewed

WNMF areas on Grand, Tyler, Bacon, Twitchell, Sherman, and Holland islands, and the west side of Bouldin Island. By phone, we discussed the WNMF area on Grand Island with the farmer. We also visited and discussed with the farmer the WNMF area on the east side of Bacon Island, which appeared in 2010. We verified the WNMF areas on Holland Tract with the landowner. The WNMF areas on Venice Island were verified by phone with the farm manager, who reported that the acreage of the area has increased substantially in recent years. Finally, we discussed and verified the evolution of WNMF areas and land use changes on Bradford Island with a former grower.

[Figures A4](#) and [A5](#) show the delineation of the Bacon and Bouldin island WNMF areas through time using aerial photos from Google Earth (outlined in [Figures 15A](#) and [15B](#) in the main paper).



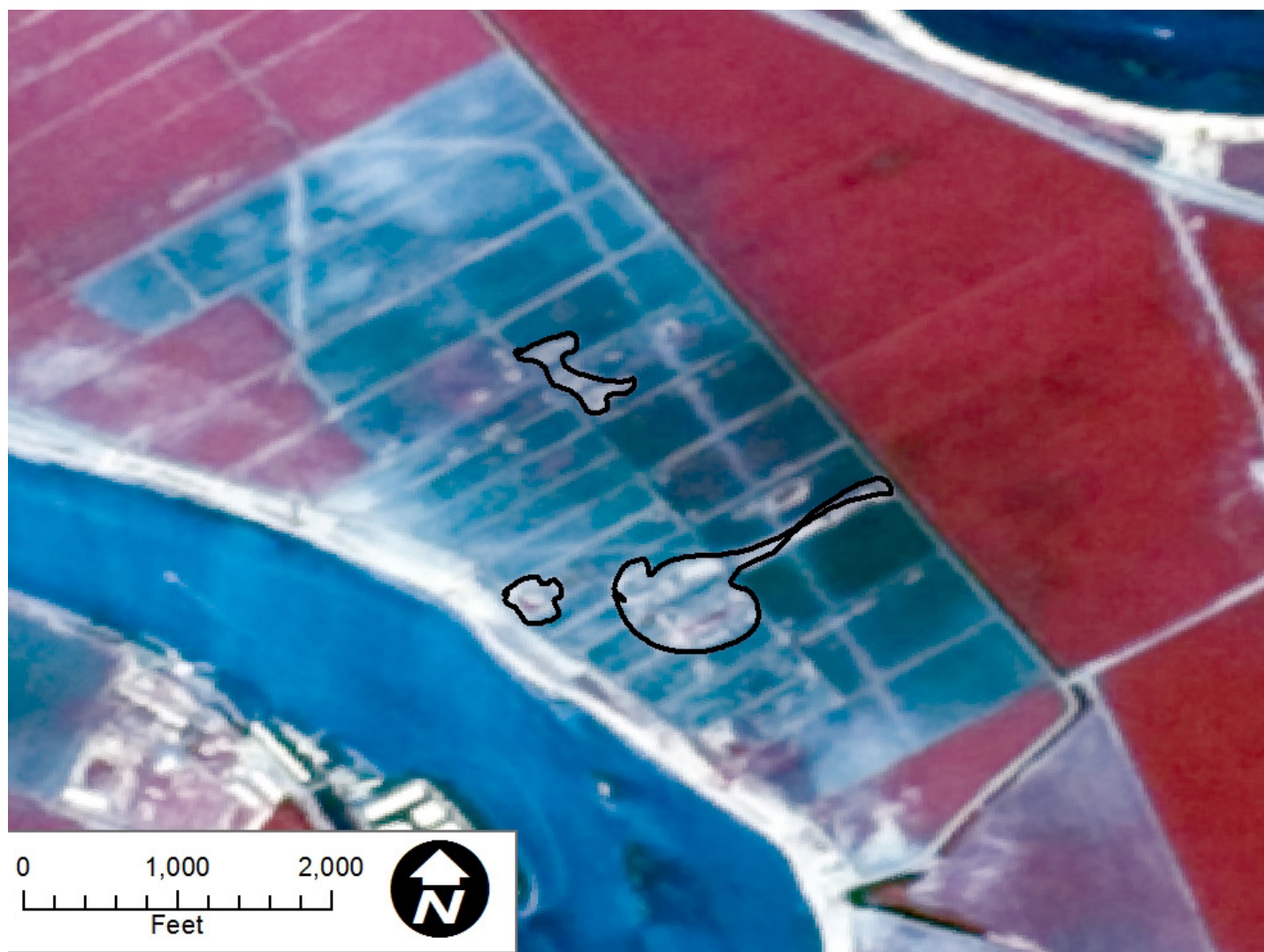
**Figure A1** WNMF area on Bacon Island in foreground, as observed in July 2012





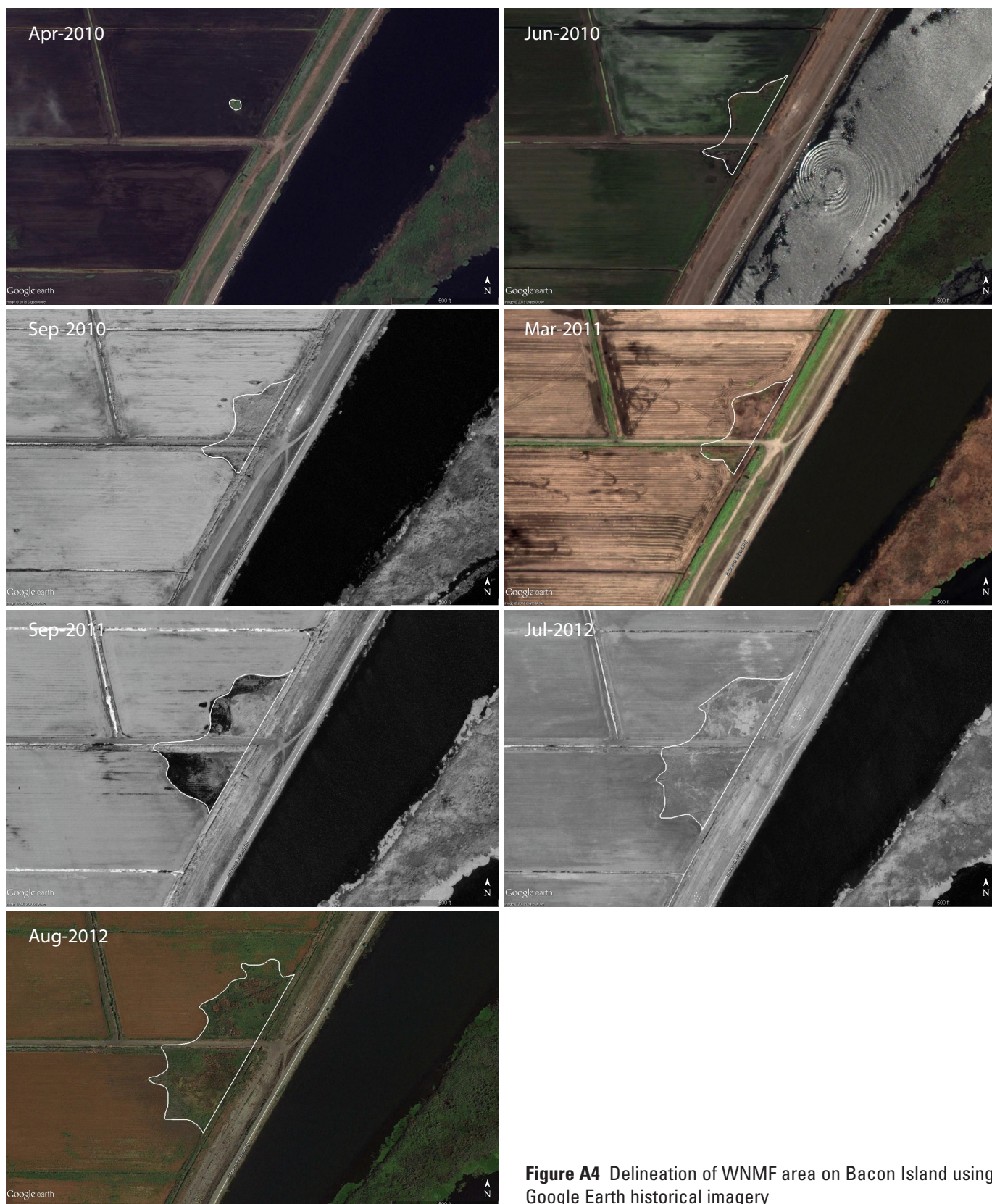
**Figure A2** WNMF area on Bouldin Island, as observed in July 2011





**Figure A3** 1984 color infrared image obtained from the U.S. Geological Survey (<http://earthexplorer.usgs.gov/>) showing the WNMF area on Bouldin Island









**Figure A5** Delineation of WNMF area on Bouldin Island using Google Earth historical imagery





**Figure A5** (continued) Delineation of WNMF area on Bouldin Island using Google Earth historical imagery