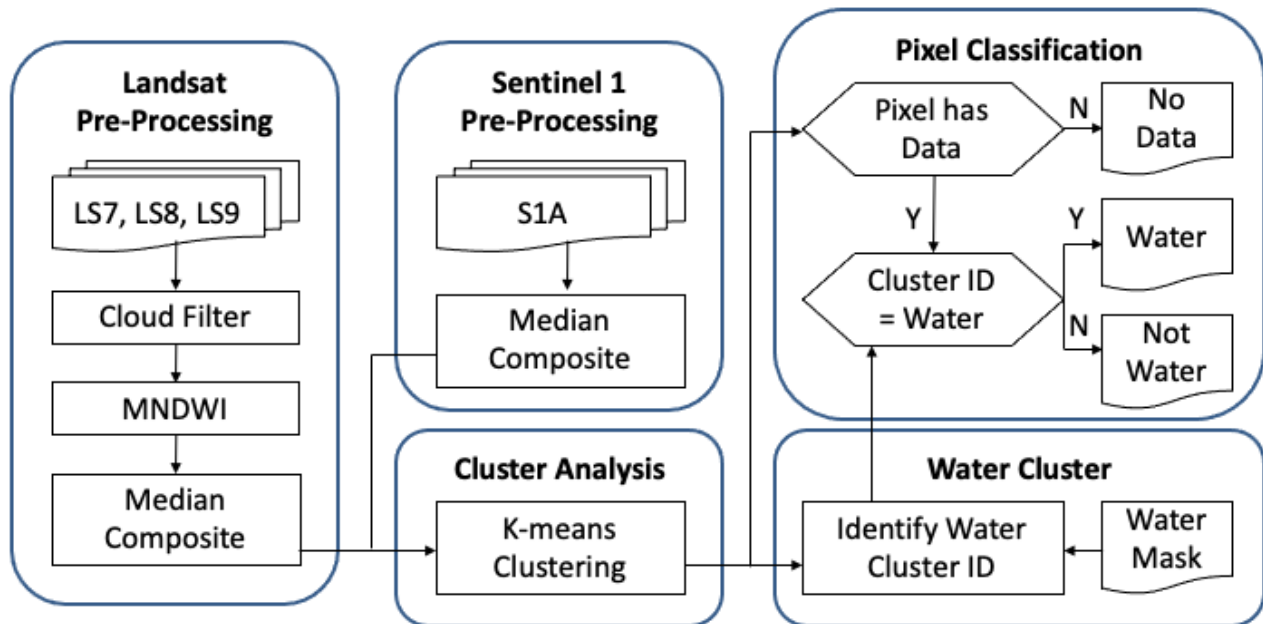
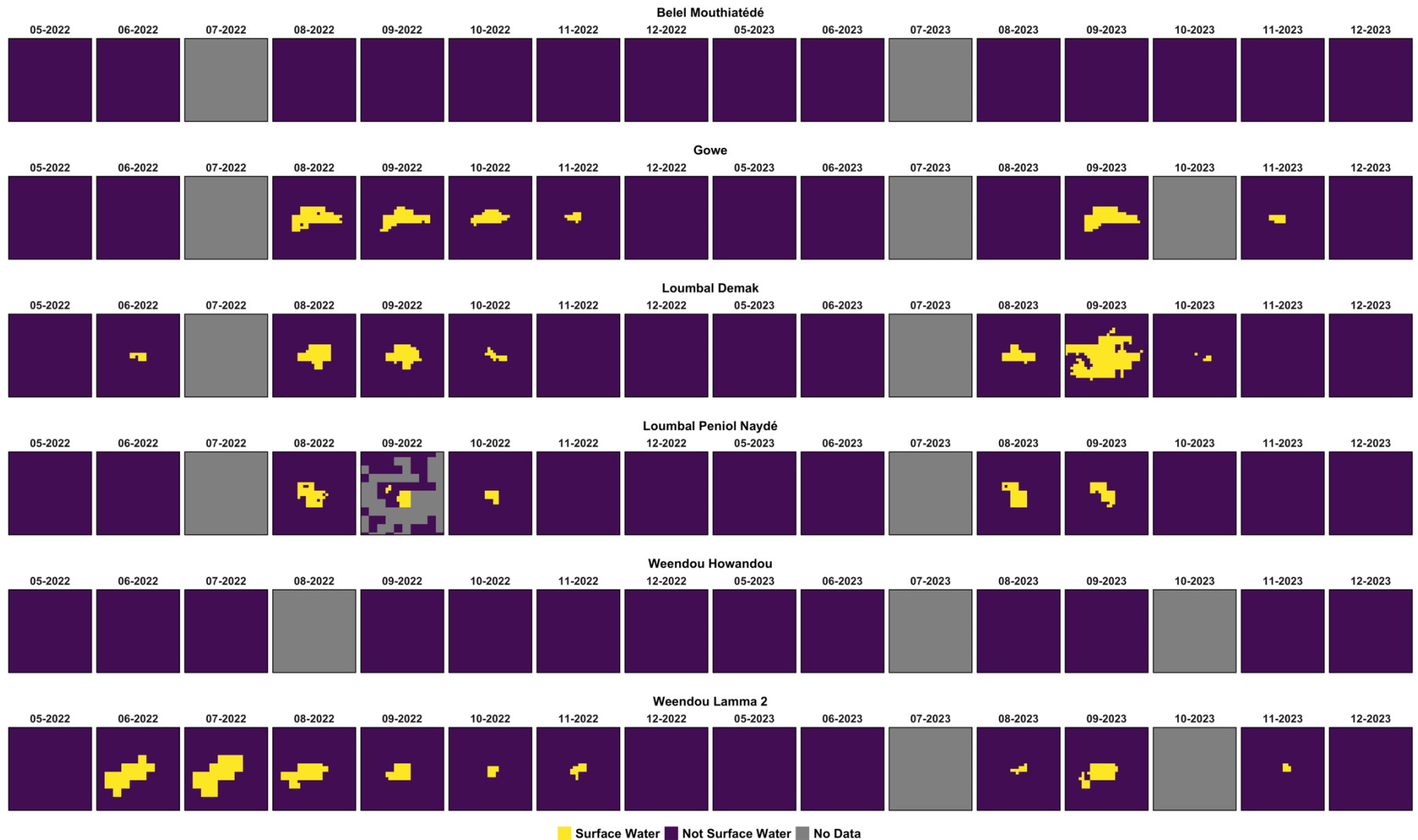


## Supplementary Material

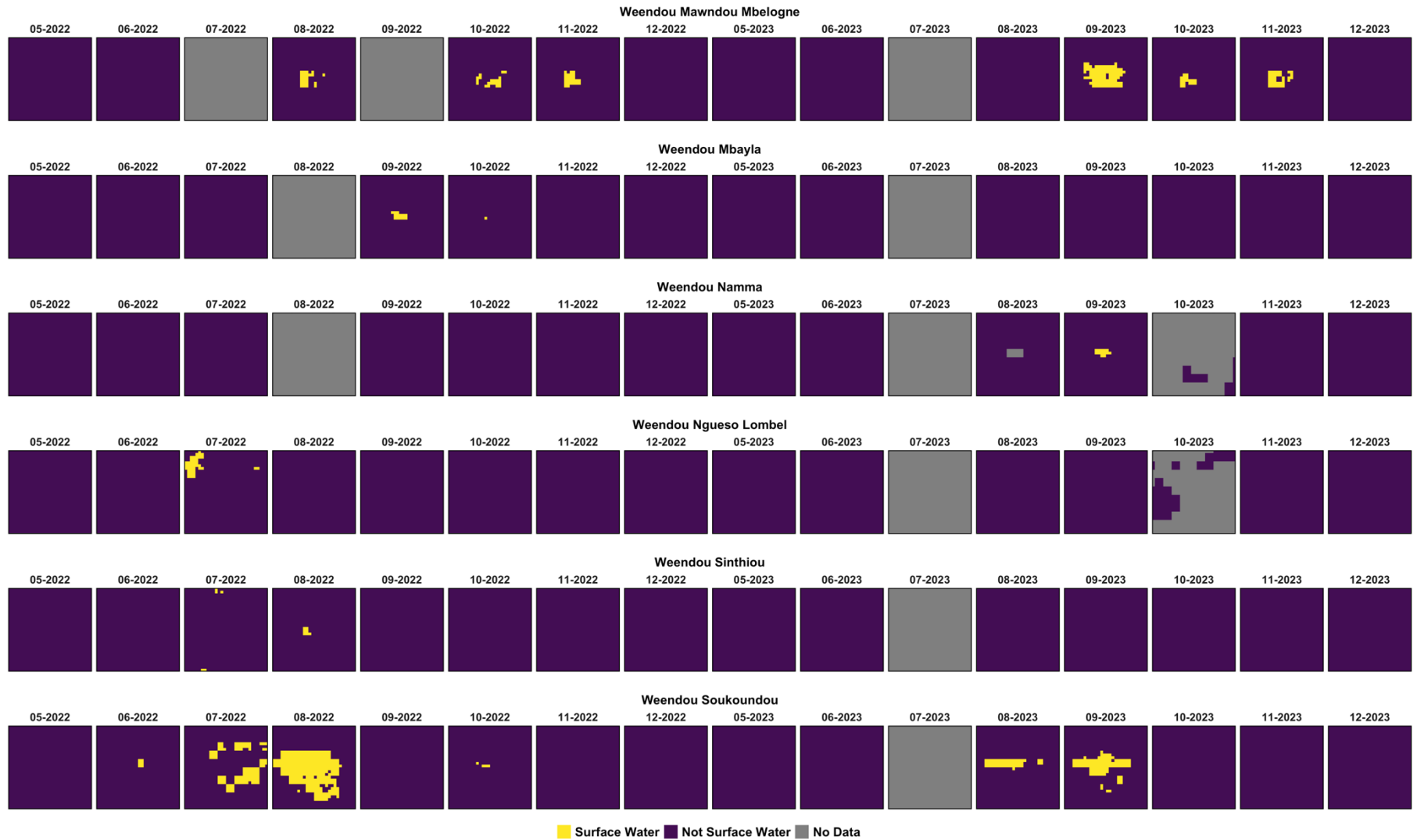
### 1 Supplementary Figures



**Supplementary Figure 1.** Flow chart of the Active-Passive Water Classification (APWC) methodology. LS7, LS8, and LS9 refer to the Landsat 7, 8, and 9 surface reflectance datasets, respectively. S1A refers to the Sentinel 1A vertical transmit-vertical receive (VV) polarization ground range detected dataset. MNDWI is the modified normalized difference water index.



**Supplementary Figure 2.** Surface water classification results by month for 6 of the 12 Action Contre la Faim (ACF) ponds. Yellow denotes pixels classified as “Surface Water” and purple denotes pixels classified as “Not Surface Water”. Pixels with no data are shown in gray. Map projection: UTM 28N.



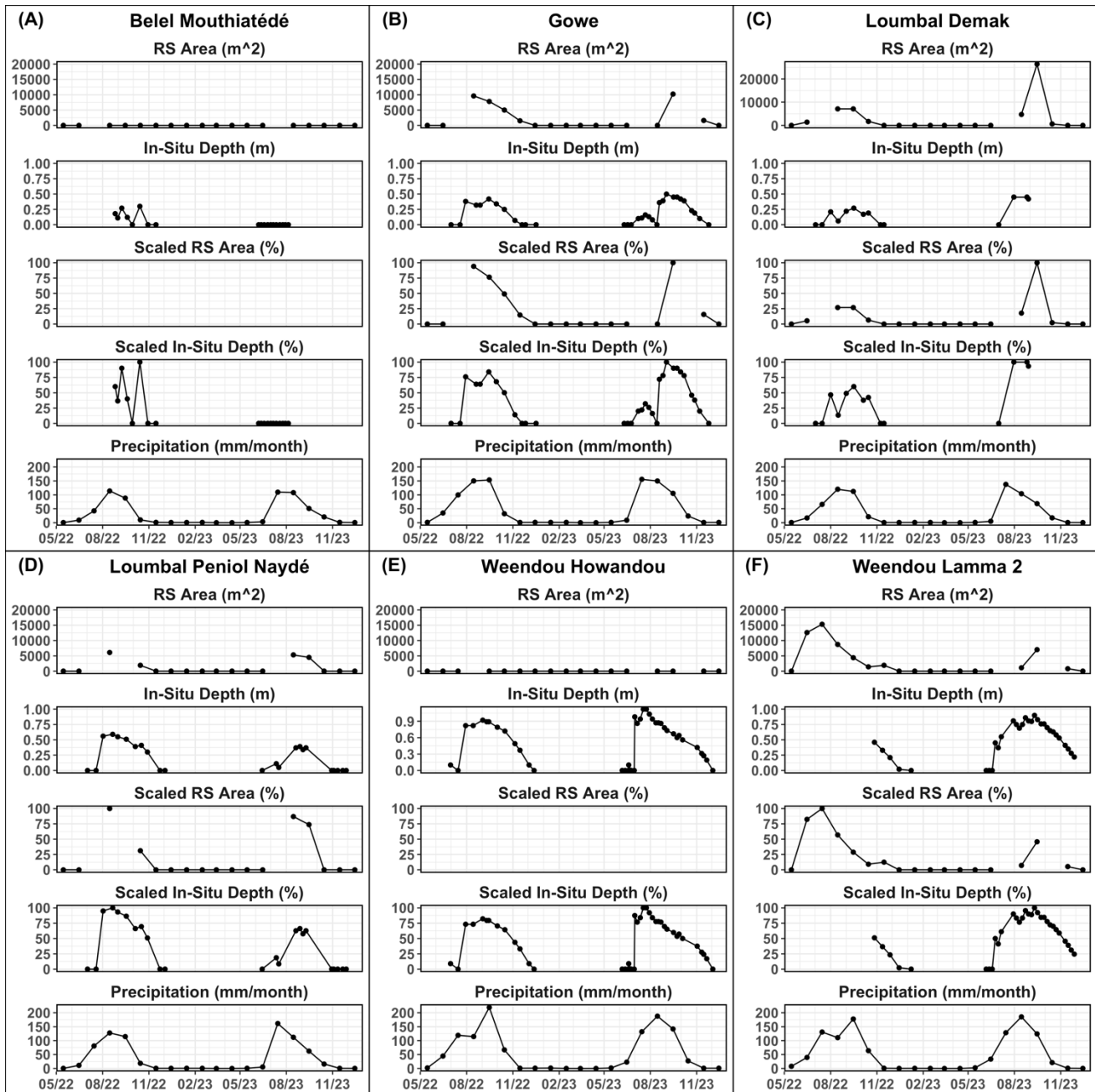
**Supplementary Figure 3.** Surface water classification results by month for 6 of the 12 Action Contre la Faim (ACF) ponds. Yellow denotes pixels classified as “Surface Water” and purple denotes pixels classified as “Not Surface Water”. Pixels with no data are shown in gray. Map projection: UTM 28N.



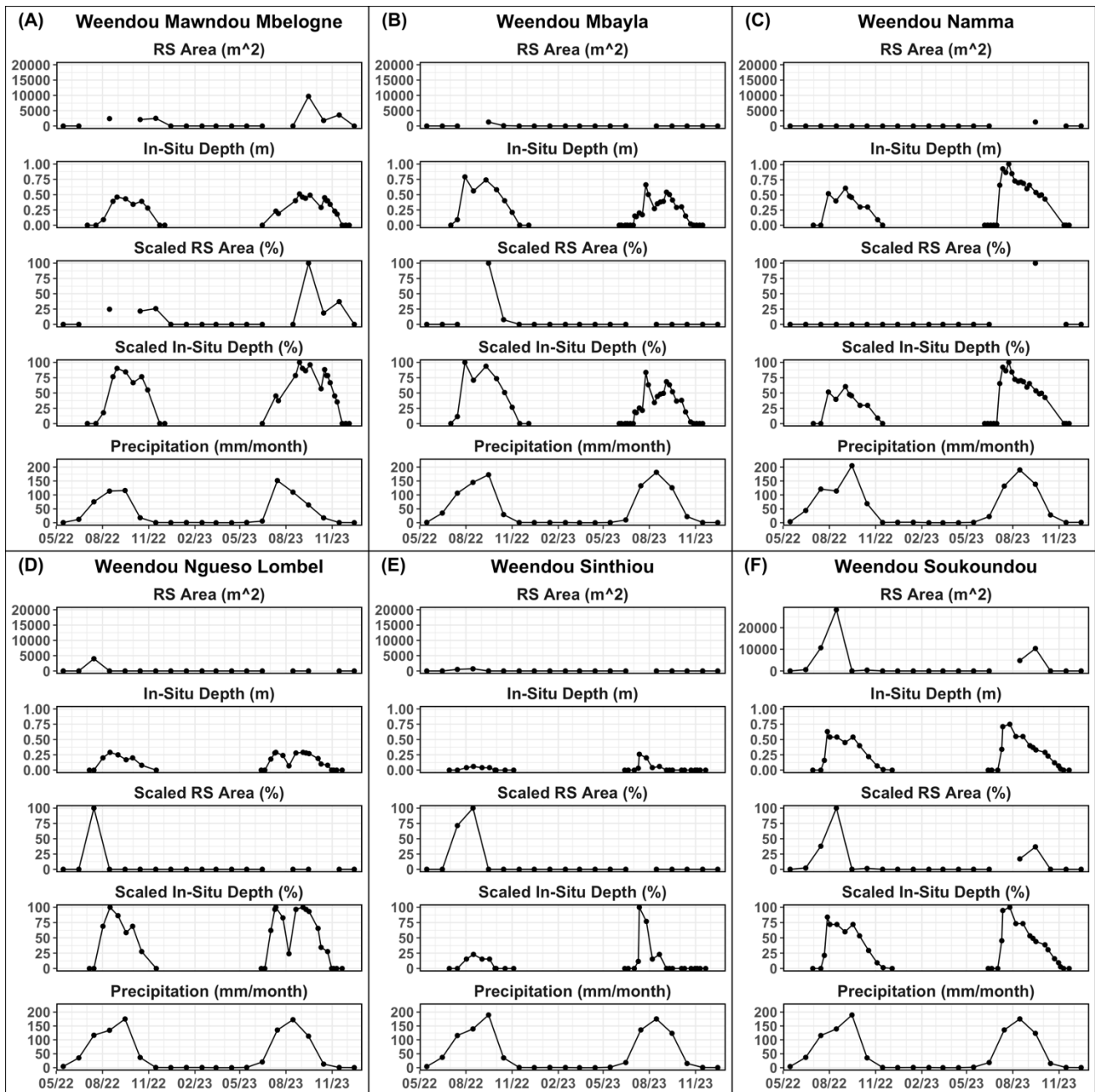
**Supplementary Figure 4.** Surface water classification results by month for 6 of the 10 Famine Early Warning Systems Network (FEWS NET) ponds. Yellow denotes pixels classified as “Surface Water” and purple denotes pixels classified as “Not Surface Water”. Pixels with no data are shown in gray. Map projection: UTM 28N.



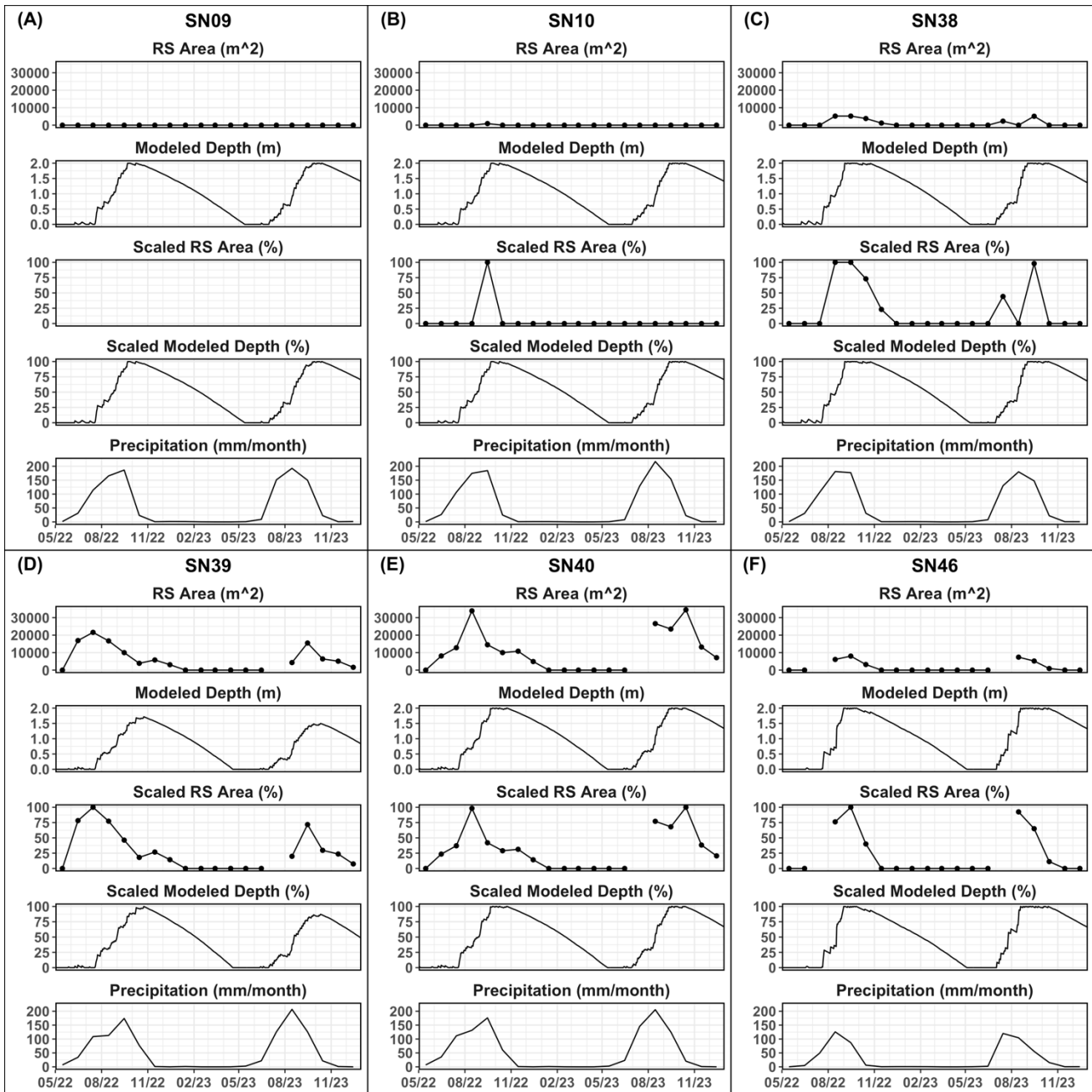
**Supplementary Figure 5.** Surface water classification results by month for 4 of the 10 Famine Early Warning Systems Network (FEWS NET) ponds. Yellow denotes pixels classified as “Surface Water” and purple denotes pixels classified as “Not Surface Water”. Pixels with no data are shown in gray. Map projection: UTM 28N.



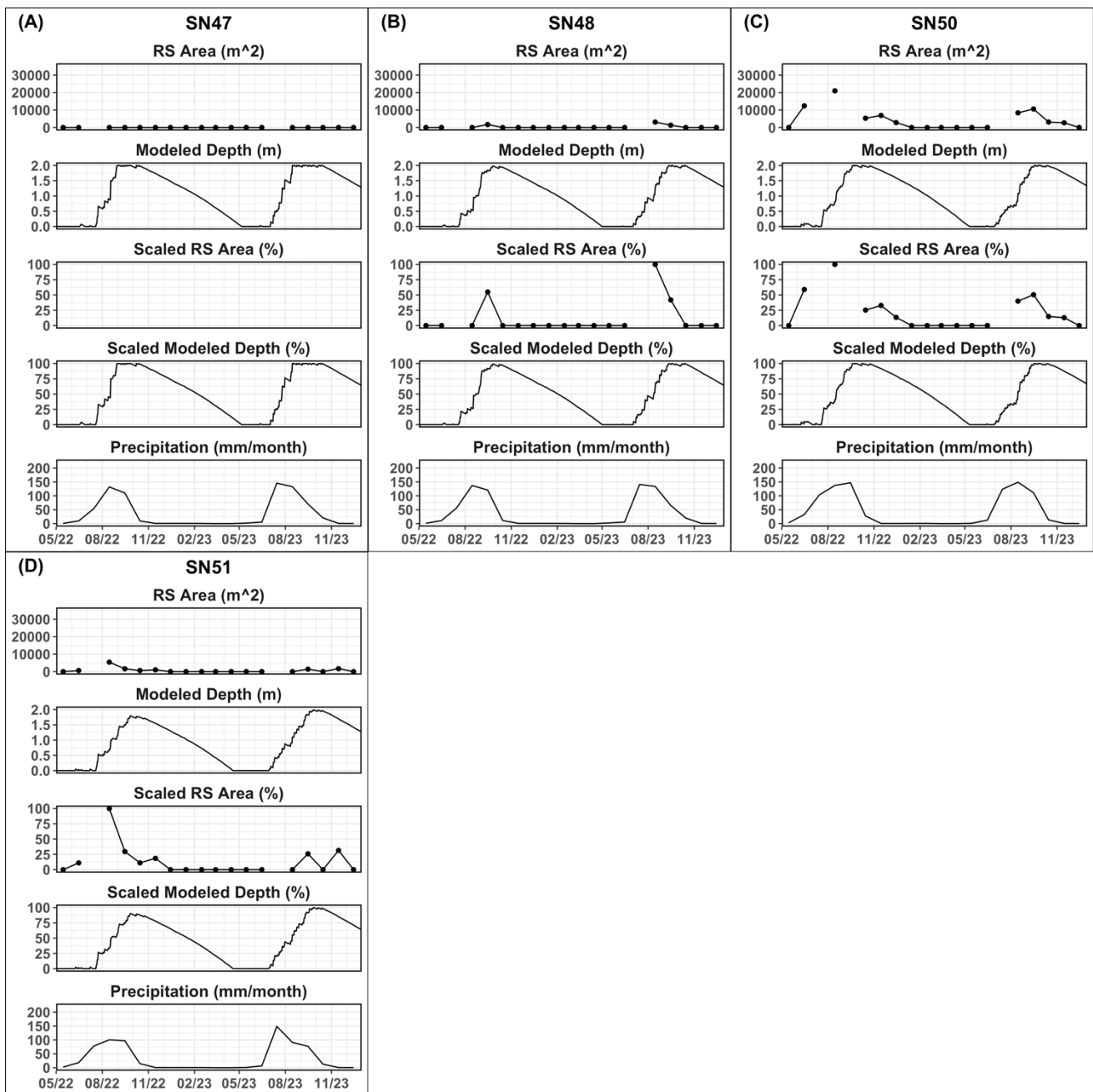
**Supplementary Figure 6.** Comparison of satellite remote sensing-derived surface water area (RS Area) in square meters, scaled RS Area as percent of maximum measured, in situ water depth (In situ Depth) in meters, scaled In situ Depth as percent of maximum measured, and Climate Hazards Group InfraRed Precipitation with Station (CHIRPS) precipitation (Precipitation) (Funk et al. 2015) at the pond in millimeters per month for Belel Mouthiatédé, Gowe, Loumbal Demak, Loumbal Peniol Naydé, Weendou Howandou, and Weendou Lamma 2 ponds (Panels (A), (B), (C), (D), (E), and (F) respectively).



**Supplementary Figure 7.** Comparison of satellite remote sensing-derived surface water area (RS Area) in square meters, scaled RS Area as percent of maximum measured, in situ water depth (In situ Depth) in meters, scaled In situ Depth as percent of maximum measured, and Climate Hazards Group InfraRed Precipitation with Station (CHIRPS) precipitation (Precipitation) (Funk et al. 2015) at the pond in millimeters per month for Weendou Mawndou Mbelogne, Weendou Mbayla, Weendou Namma, Weendou Ngueso Lombel, Weendou Sinthiou, and Weendou Soukoundou ponds (Panels (A), (B), (C), (D), (E), and (F) respectively).



**Supplementary Figure 8.** Comparison of satellite remote sensing-derived surface water area (RS Area) in square meters, scaled RS Area as percent of maximum measured, model water depth (Modeled Depth) in meters, scaled Modeled Depth as percent of maximum measured, and Climate Hazards Group InfraRed Precipitation with Station (CHIRPS) precipitation (Precipitation) (Funk et al. 2015) at the pond in millimeters per month for SN09, SN10, SN38, SN39, SN40, and SN46 ponds (panels (A), (B), (C), (D), (E), and (F), respectively).



**Supplementary Figure 9.** Comparison of satellite remote sensing-derived surface water area (RS Area) in square meters, scaled RS Area as percent of maximum measured, model water depth (Modeled Depth) in meters, scaled Modeled Depth as percent of maximum measured, and Climate Hazards Group InfraRed Precipitation with Station (CHIRPS) precipitation (Precipitation) (Funk et al. 2015) at the pond in millimeters per month for SN47, SN48, SN50, and SN51 (panels (A), (B), (C), and (D), respectively).