

Supplementary Material

to

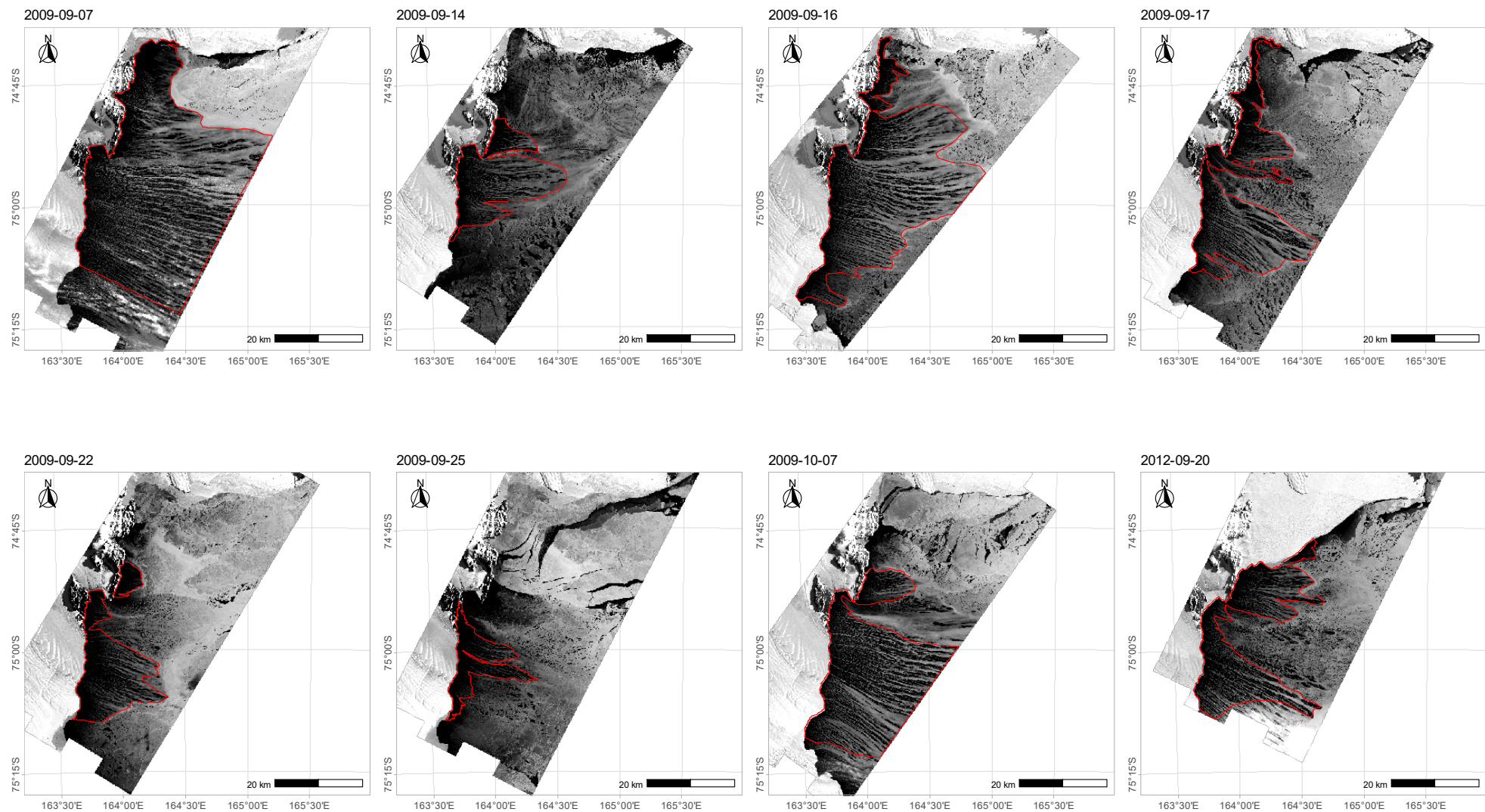
**Spatial characteristics of frazil streaks in the Terra Nova Bay Polynya
from high-resolution visible satellite imagery**

Katarzyna Bradtke^{1*}, Agnieszka Herman²

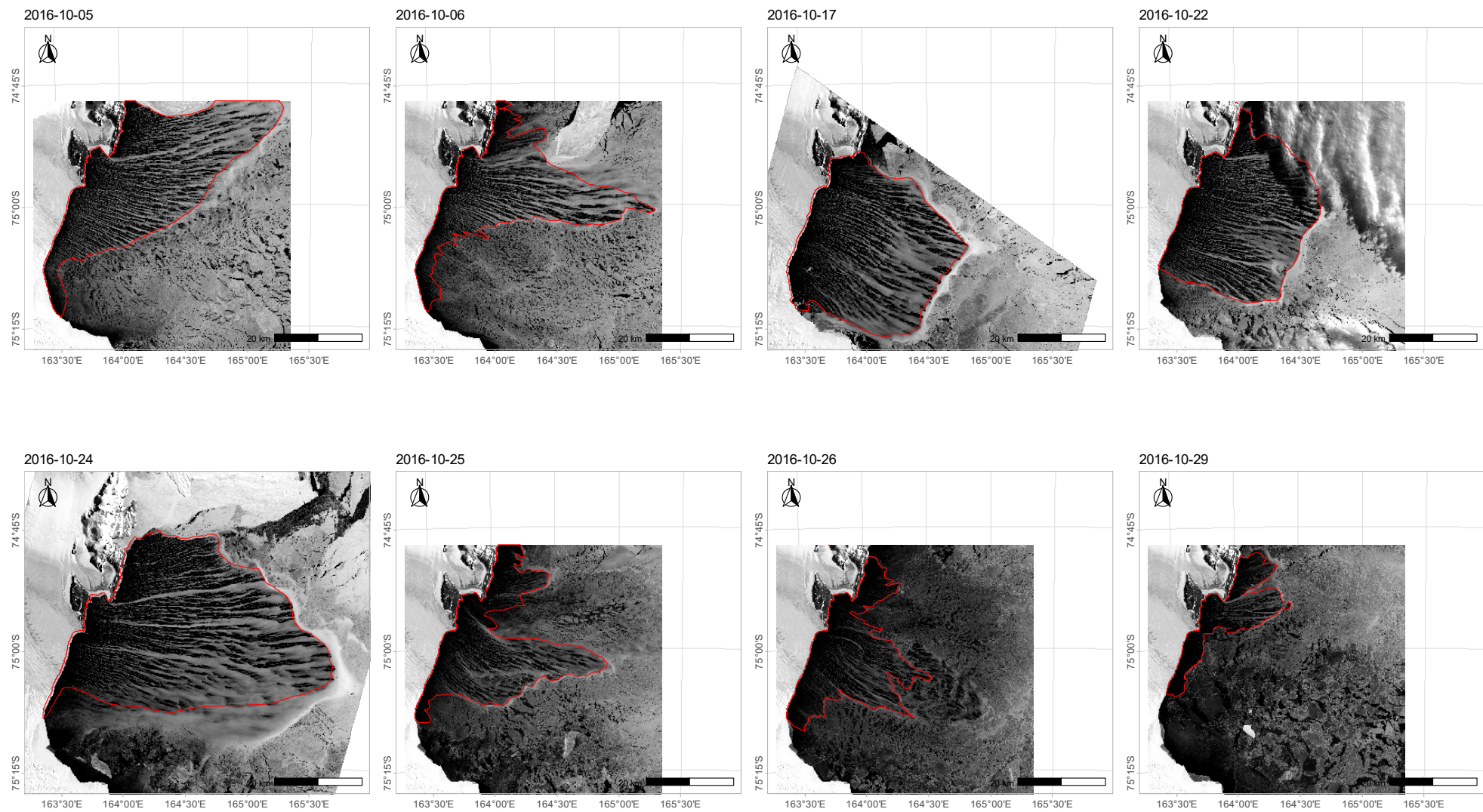
¹ Institute of Oceanography, University of Gdansk, Gdynia, Poland

² Institute of Oceanology, Polish Academy of Sciences, Sopot, Poland

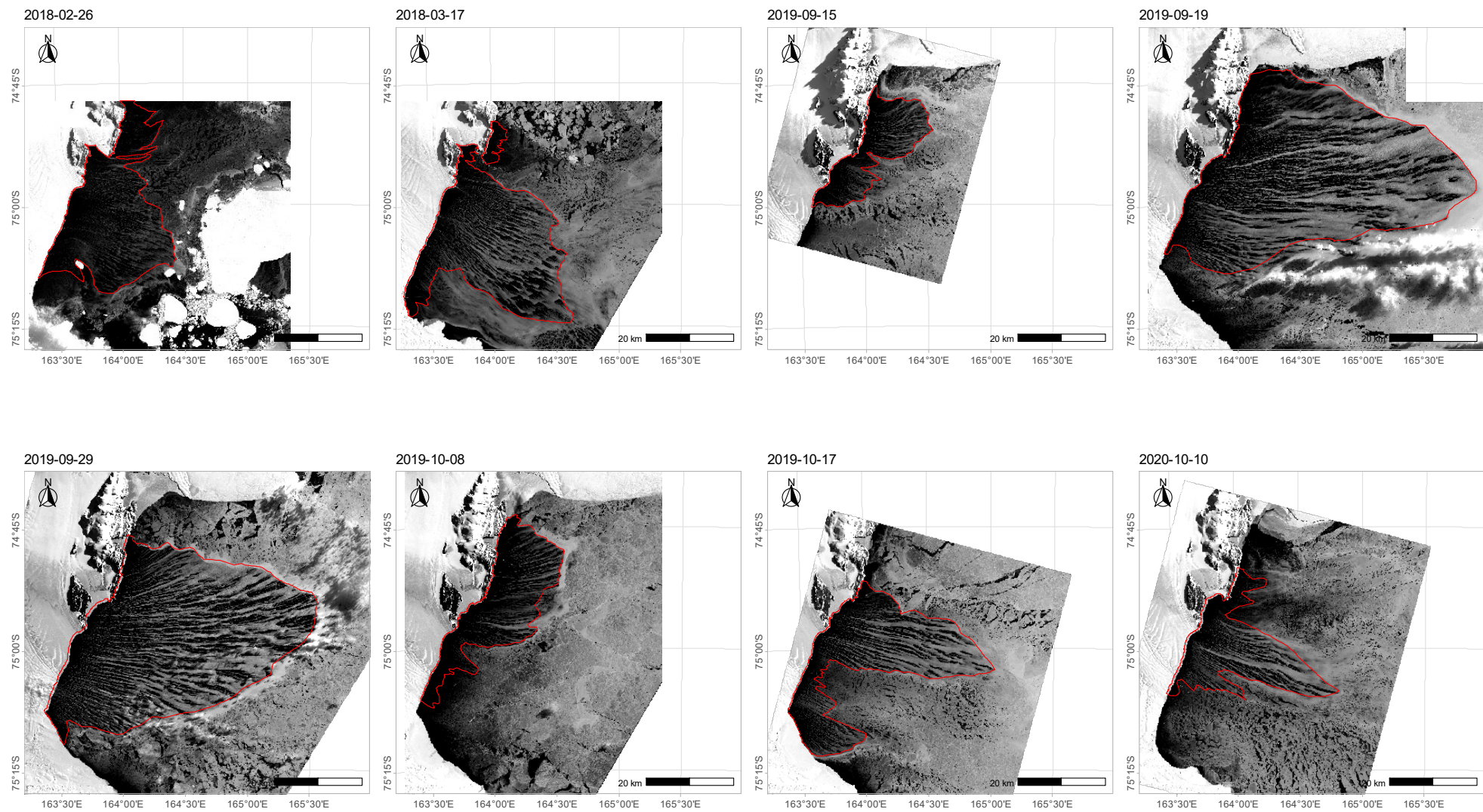
* corresponding author: katarzyna.bradtke@ug.edu.pl



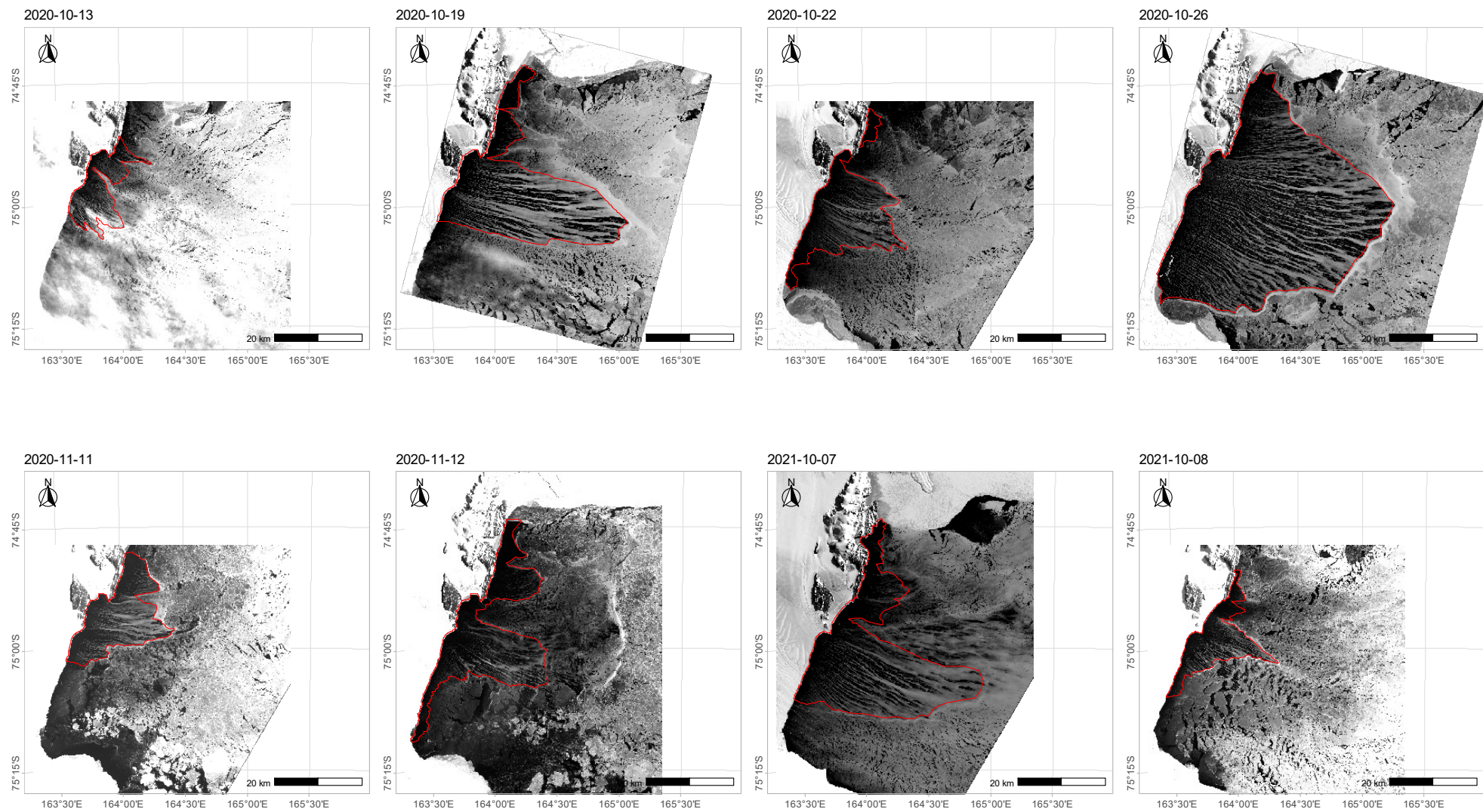
Supplementary **Figure S1** (continued on the following three pages): Satellite images analyzed in the study (panchromatic band reflectance). Red lines mark the boundaries of regions classified as polynyas.



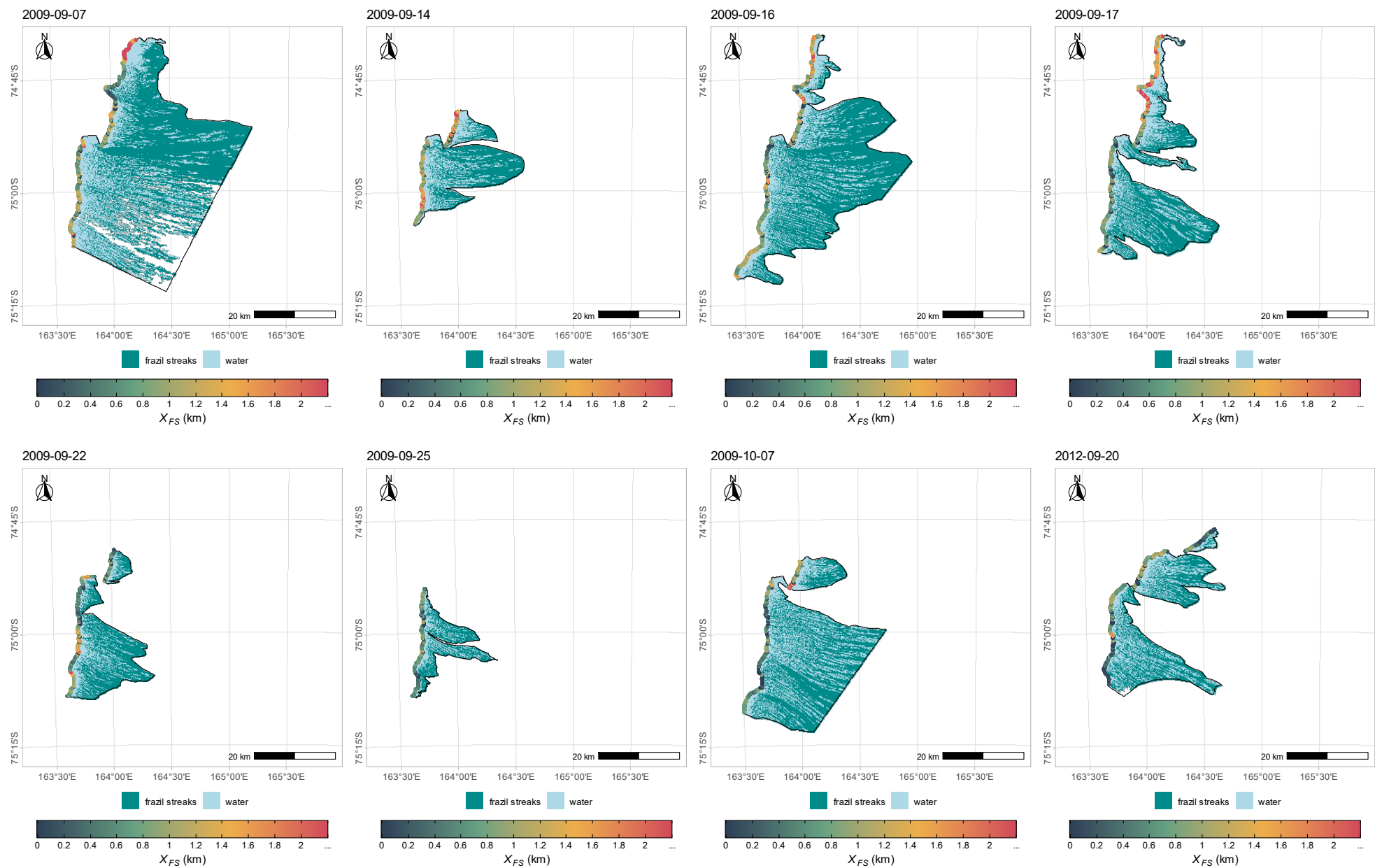
Supplementary **Figure S1** (*continued*)



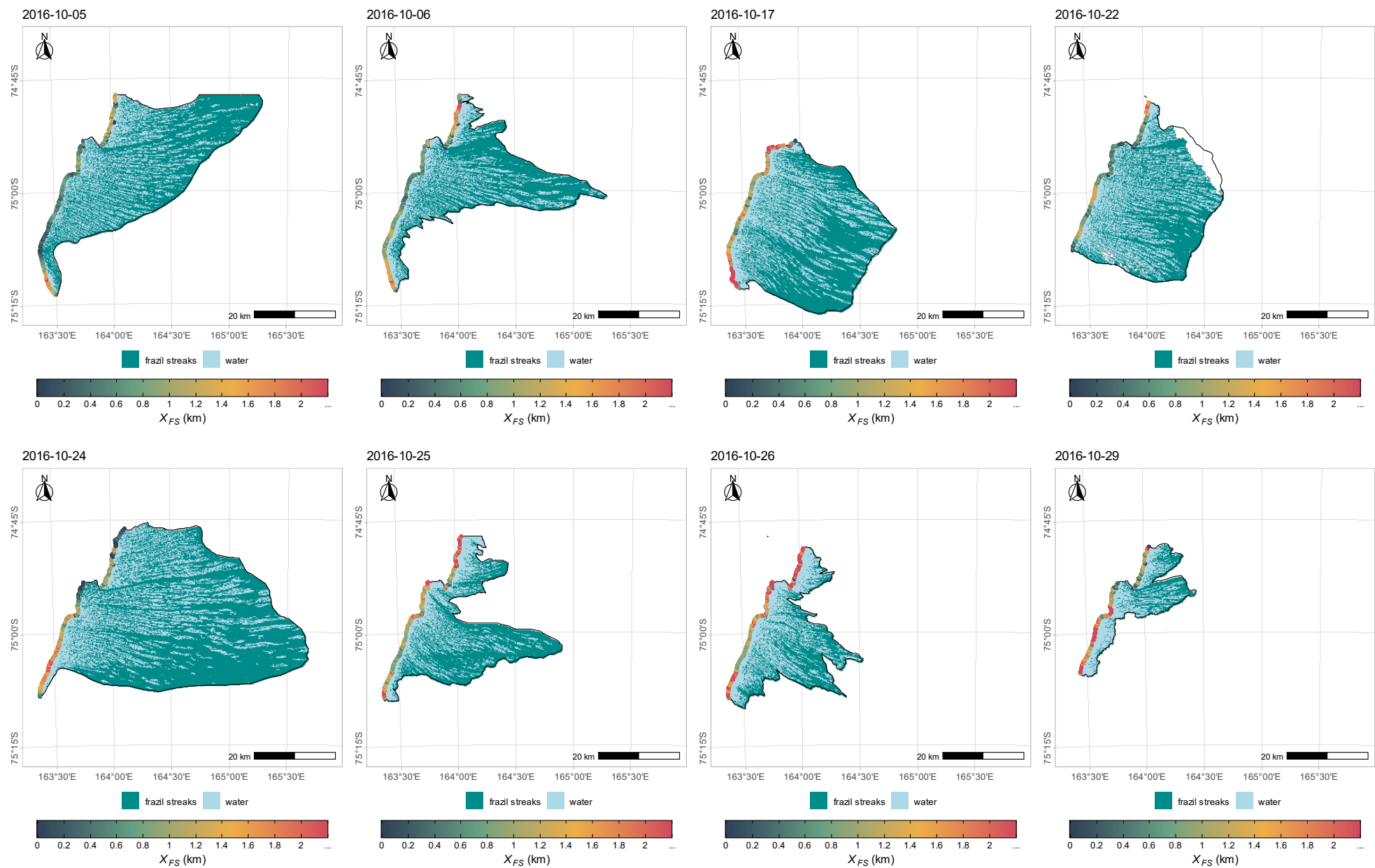
Supplementary **Figure S1** (*continued*)



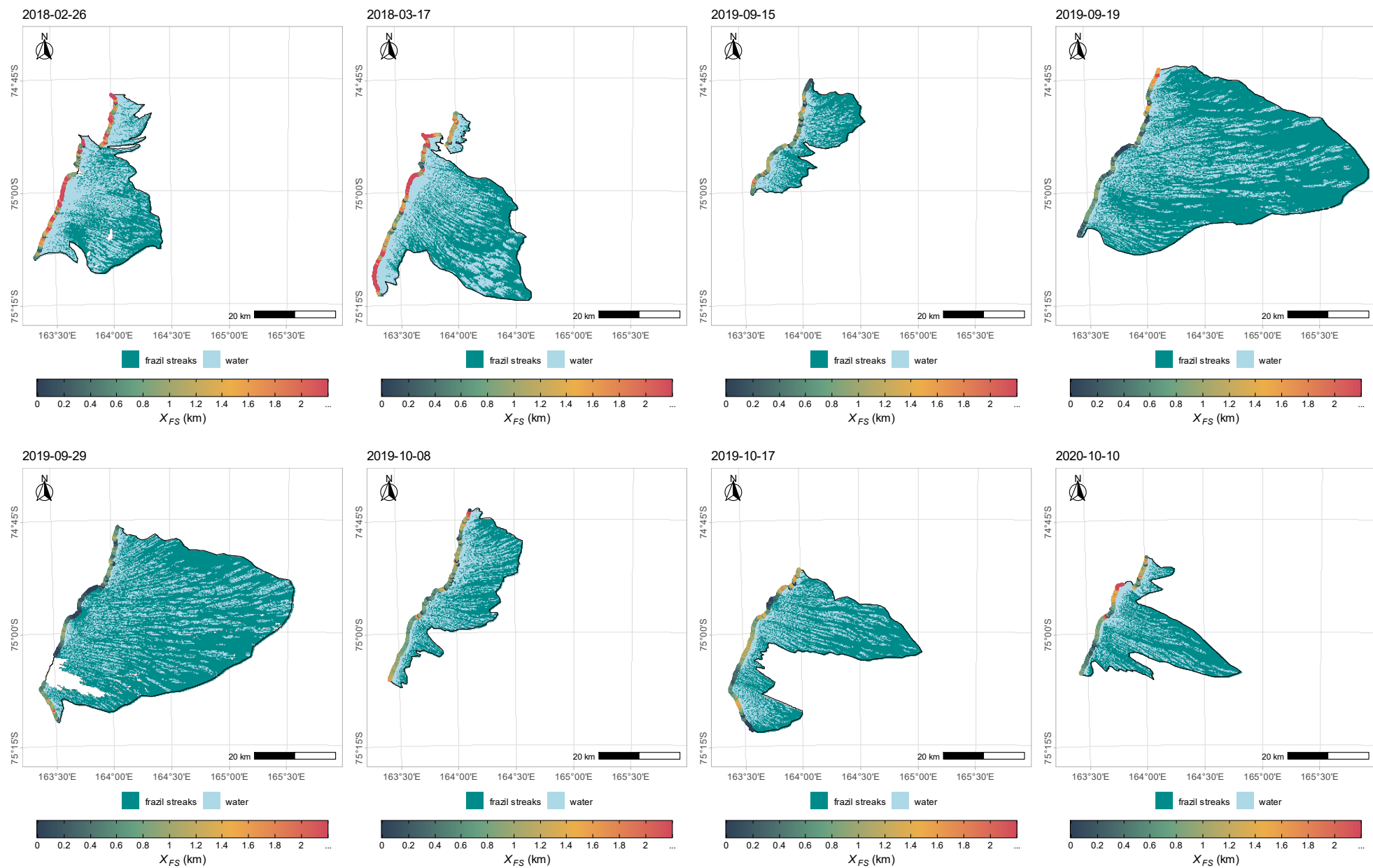
Supplementary **Figure S1** (*continued*)



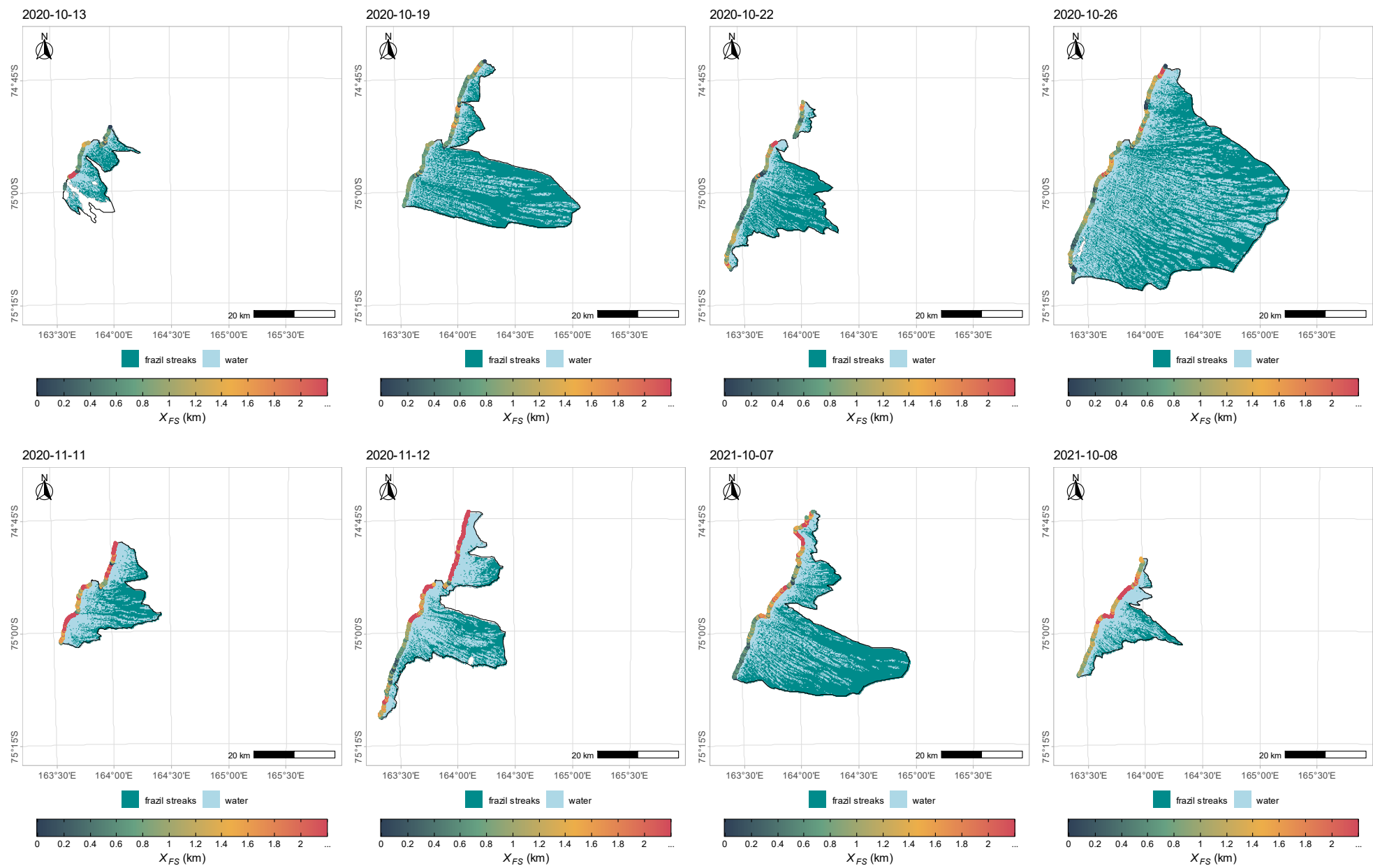
Supplementary Figure S2 (continued on the following three pages): Frazil streaks detected from the satellite data and distance X_{FS} (km) from the ice sheet/coast to the frazil streaks



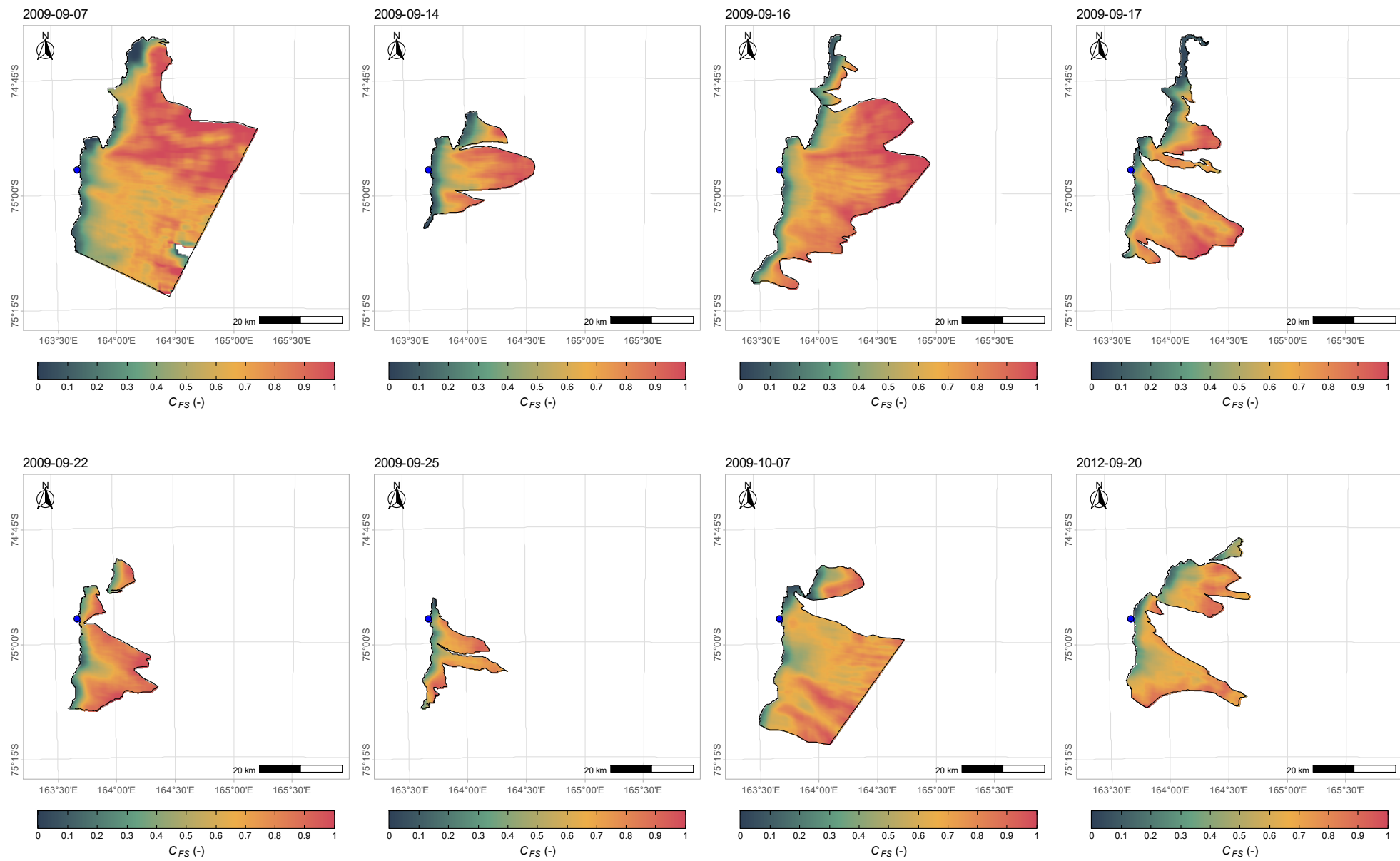
Supplementary Figure S2 (*continued*)



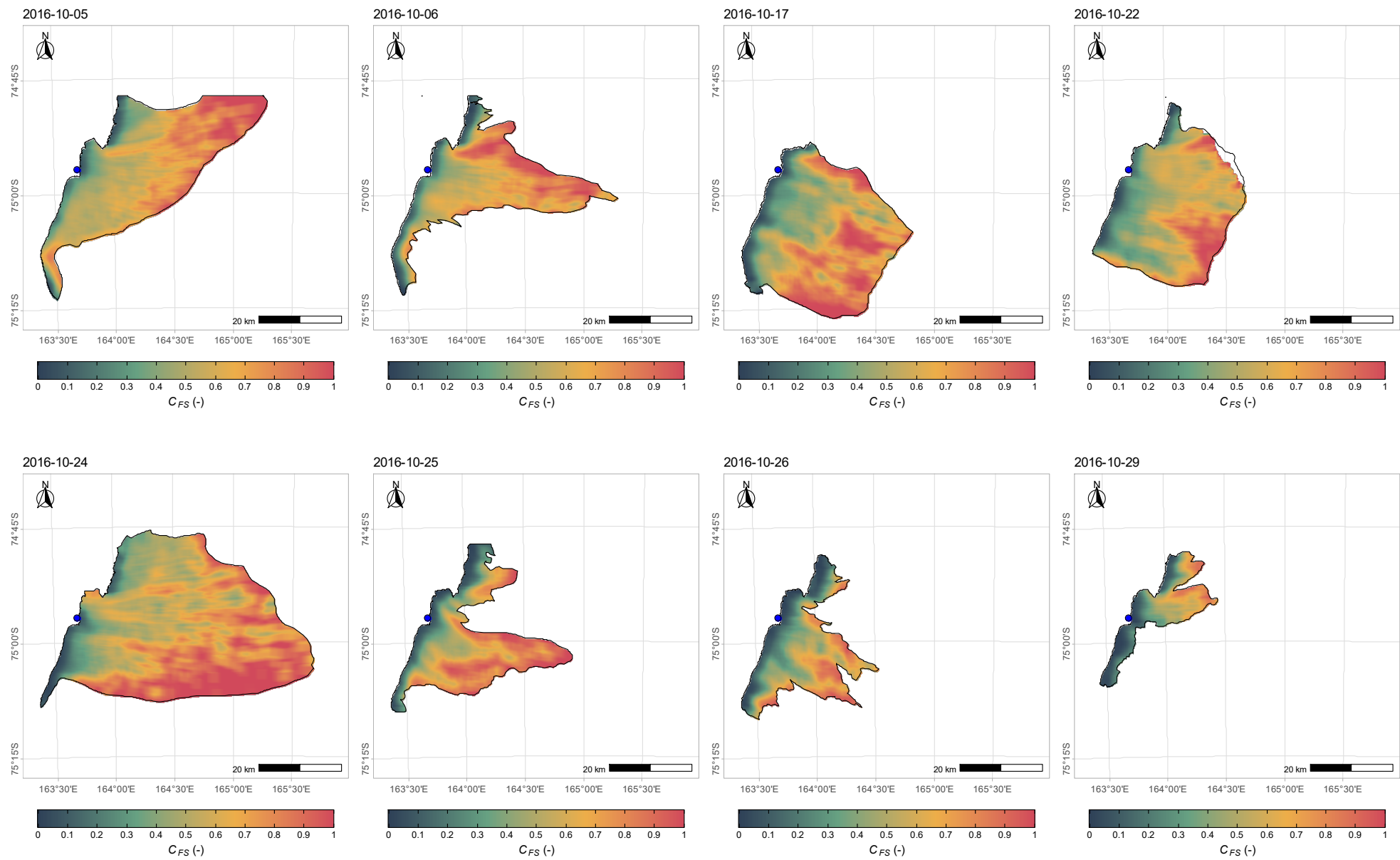
Supplementary Figure S2 (*continued*)



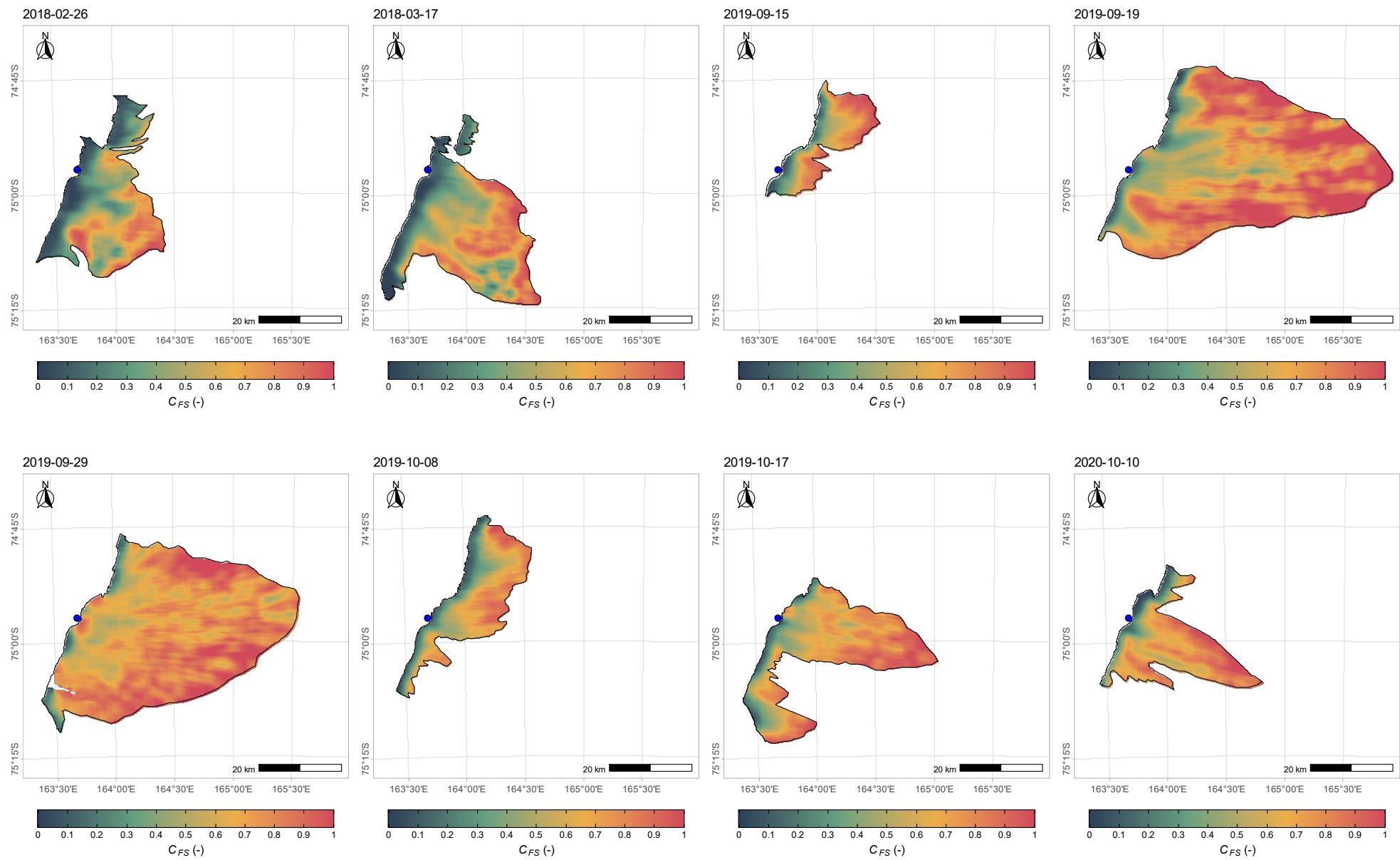
Supplementary Figure S2 (*continued*)



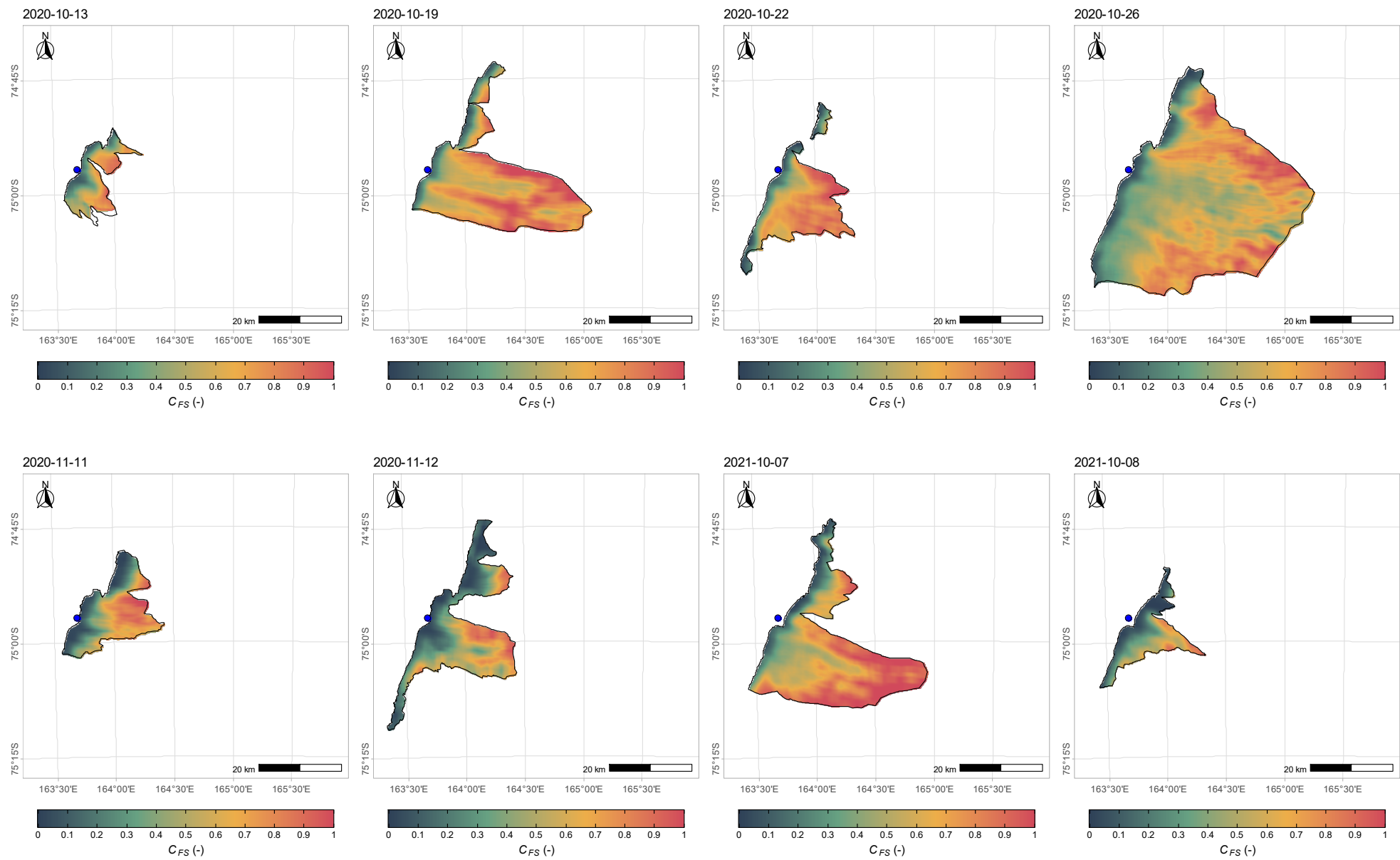
Supplementary Figure S3 (continued on the following three pages): Frazil concentration C_{FS} computed in 2.5×2.5 km (256×256 pixels) moving windows; the blue dot marks the location of the Manuela weather station.



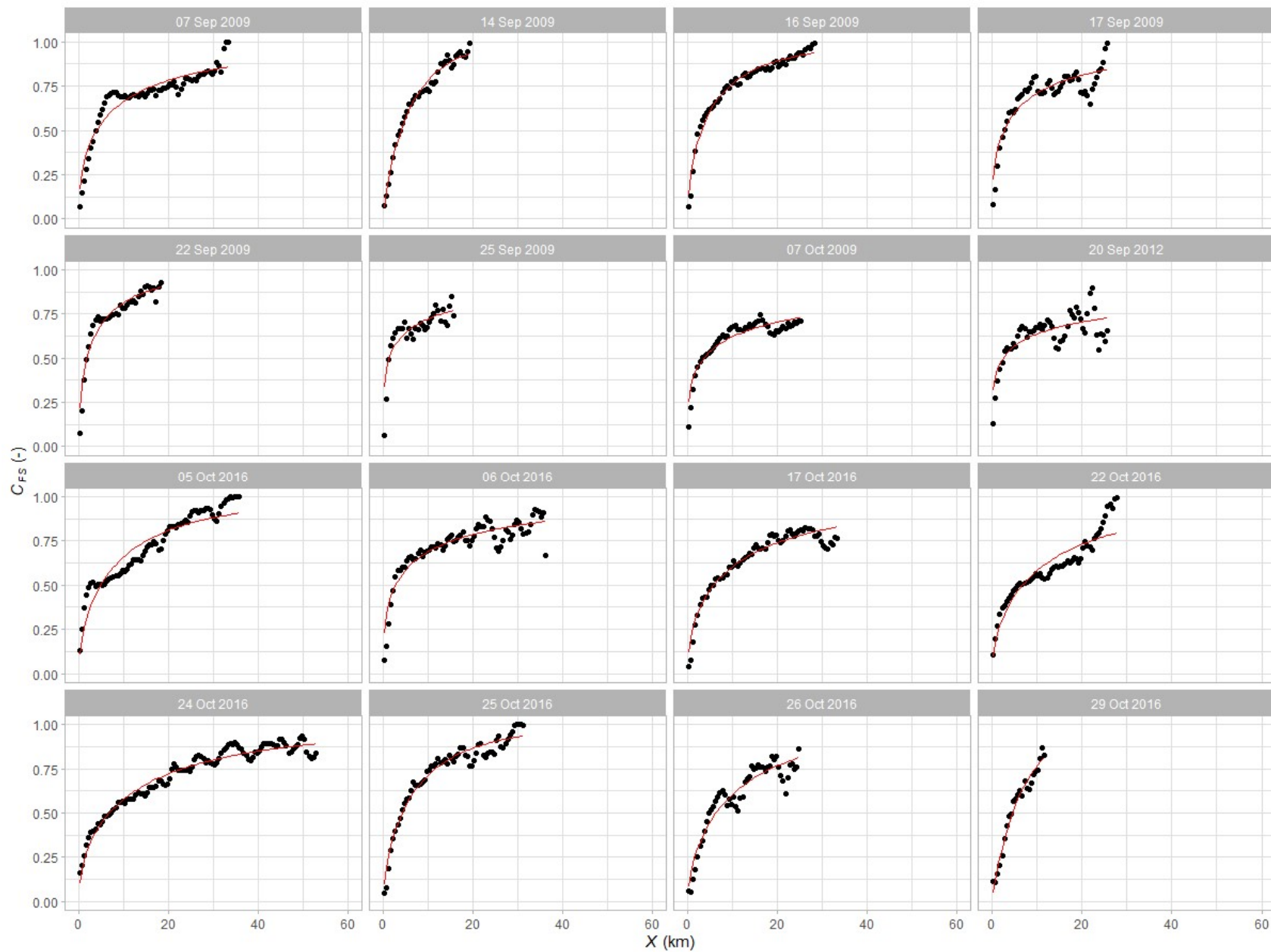
Supplementary Figure S3 (*continued*)



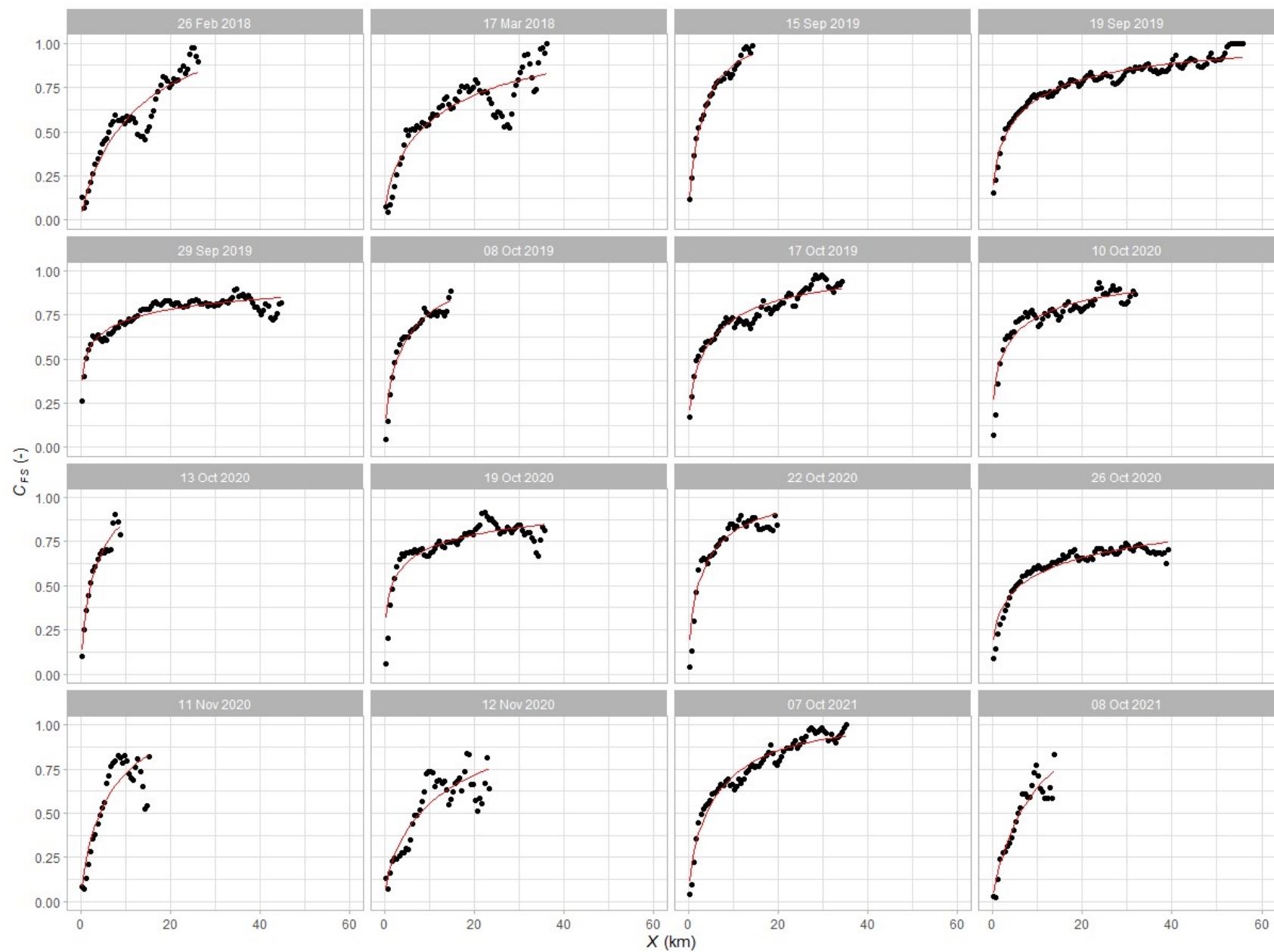
Supplementary Figure S3 (*continued*)



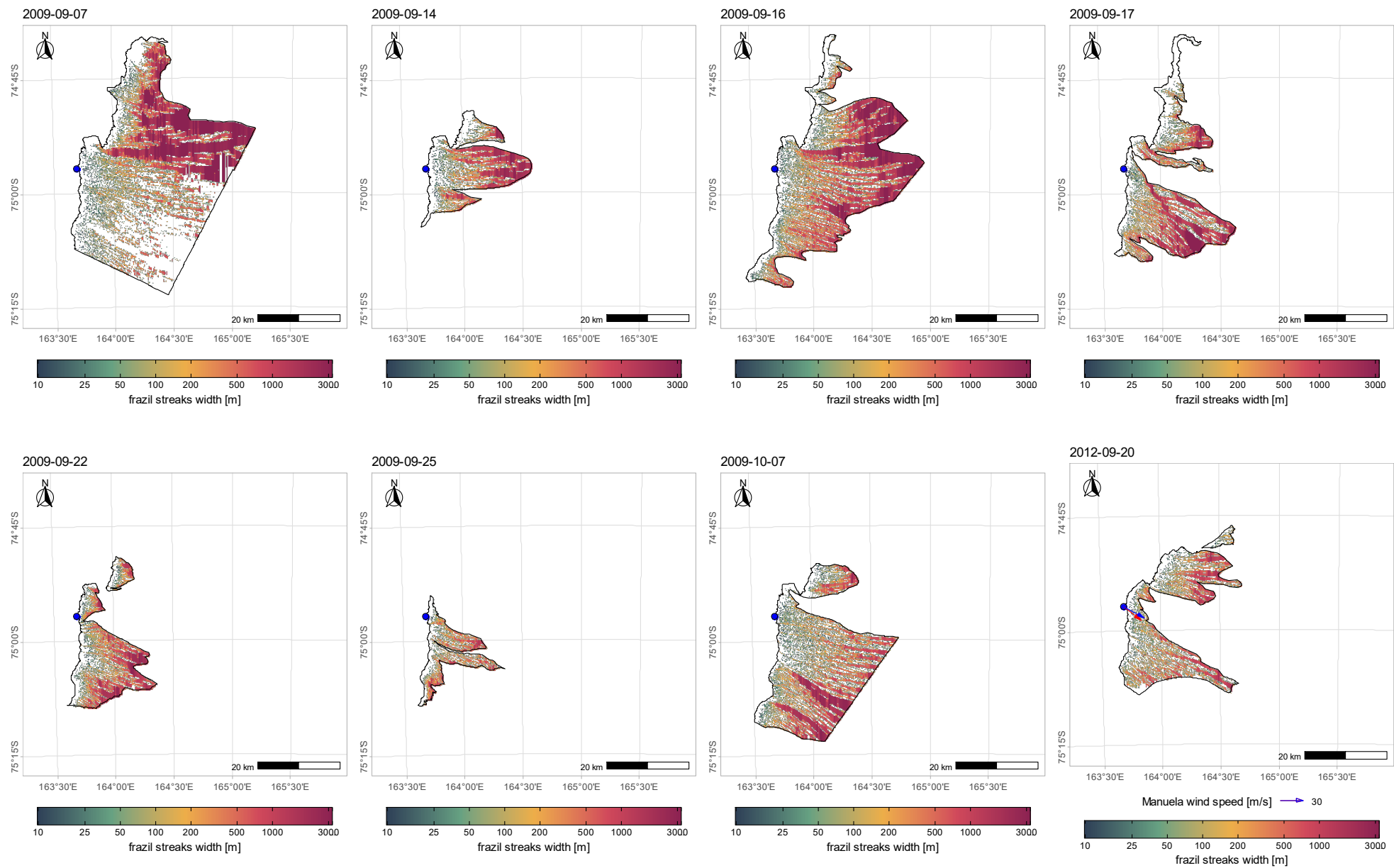
Supplementary Figure S3 (*continued*)



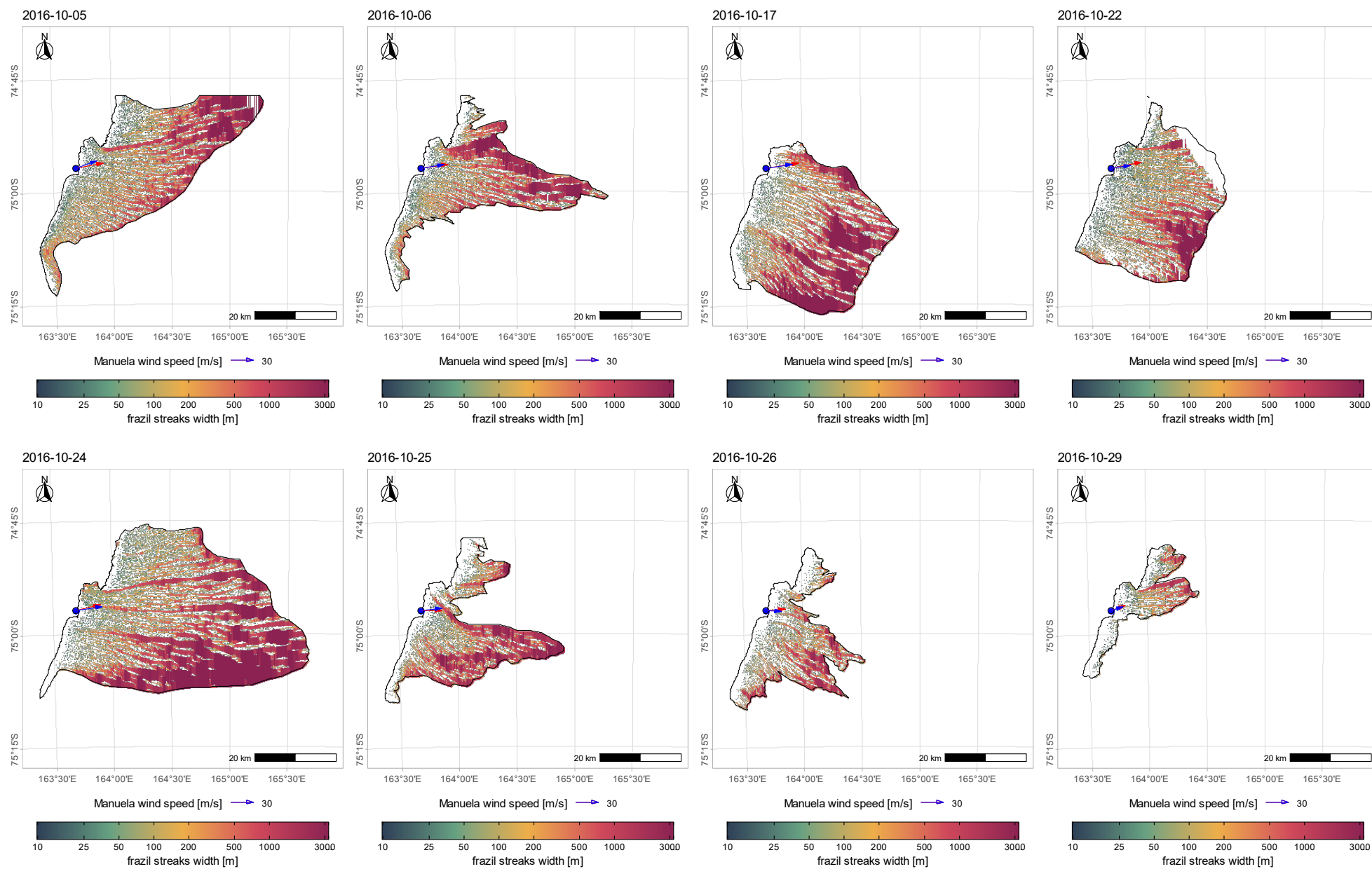
Supplementary Figure S4 (continued on the following page): Frazil ice concentration C_{FS} in function of the distance from the ice sheet/coast X . The dots show values of C_{FS} averaged within 500-m wide stripes perpendicular to X . Red lines show the least-square fit to the functions (9),(10) in the main text.



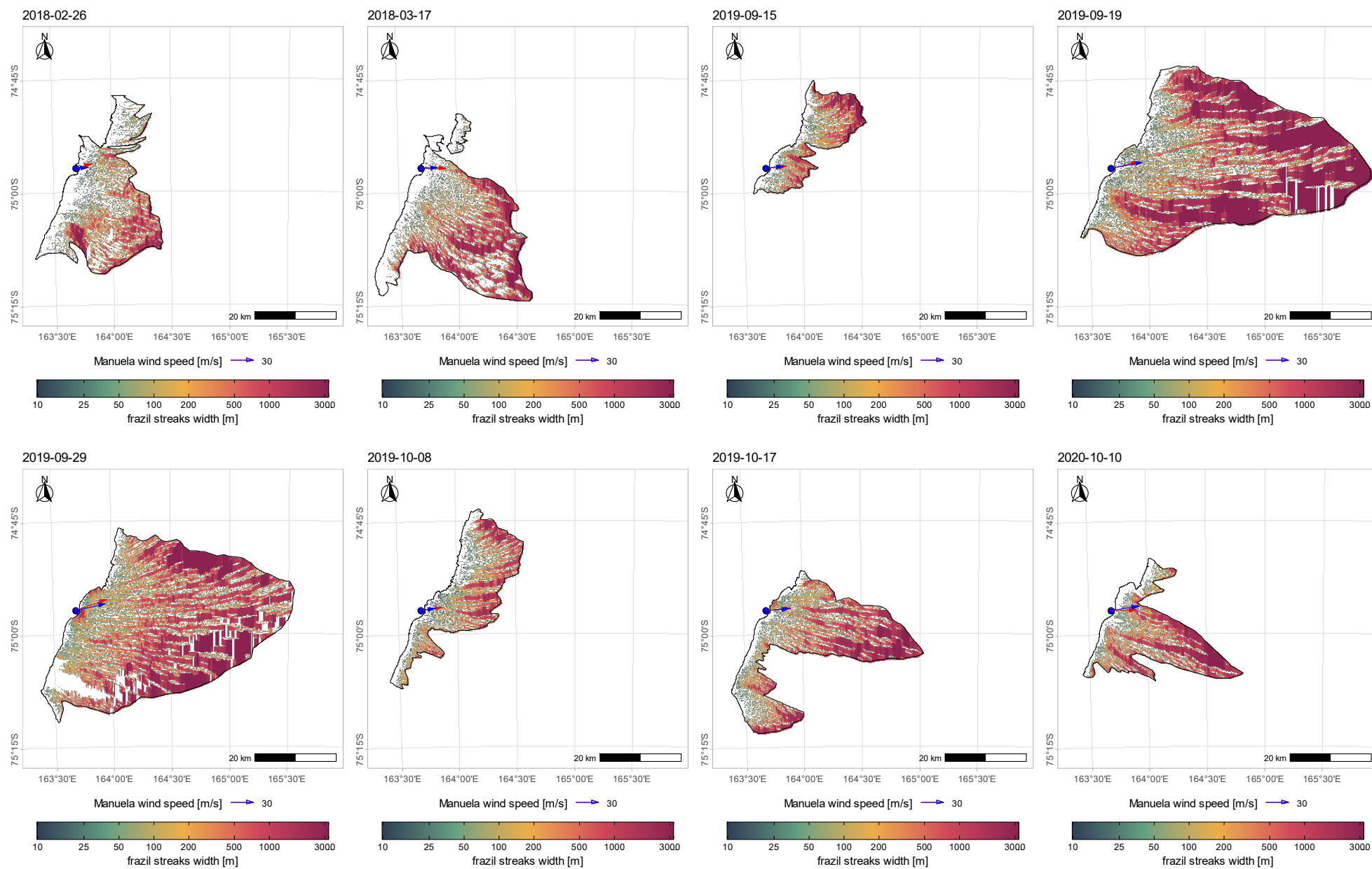
Supplementary Figure S4 (continued)



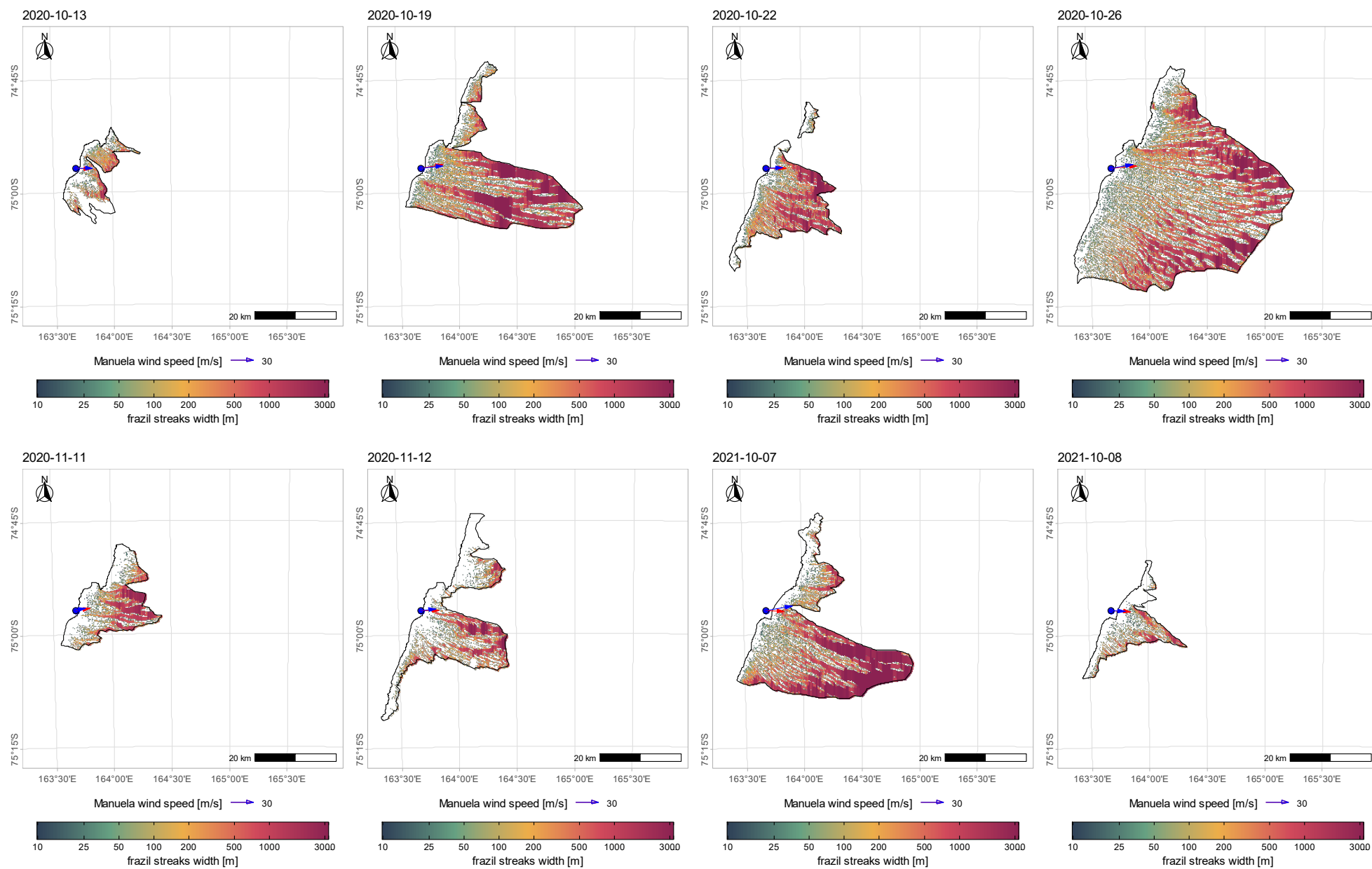
Supplementary Figure S5 (continued on the following three pages): Frazil streaks width measured in the direction of raster columns (i.e., along the UTM58S Y axis; profiles in 10m steps). Arrows indicate the wind direction measured at the Manuela station (red – instantaneous, blue – averaged over 24 h; note that they are available only from 2012 onwards)



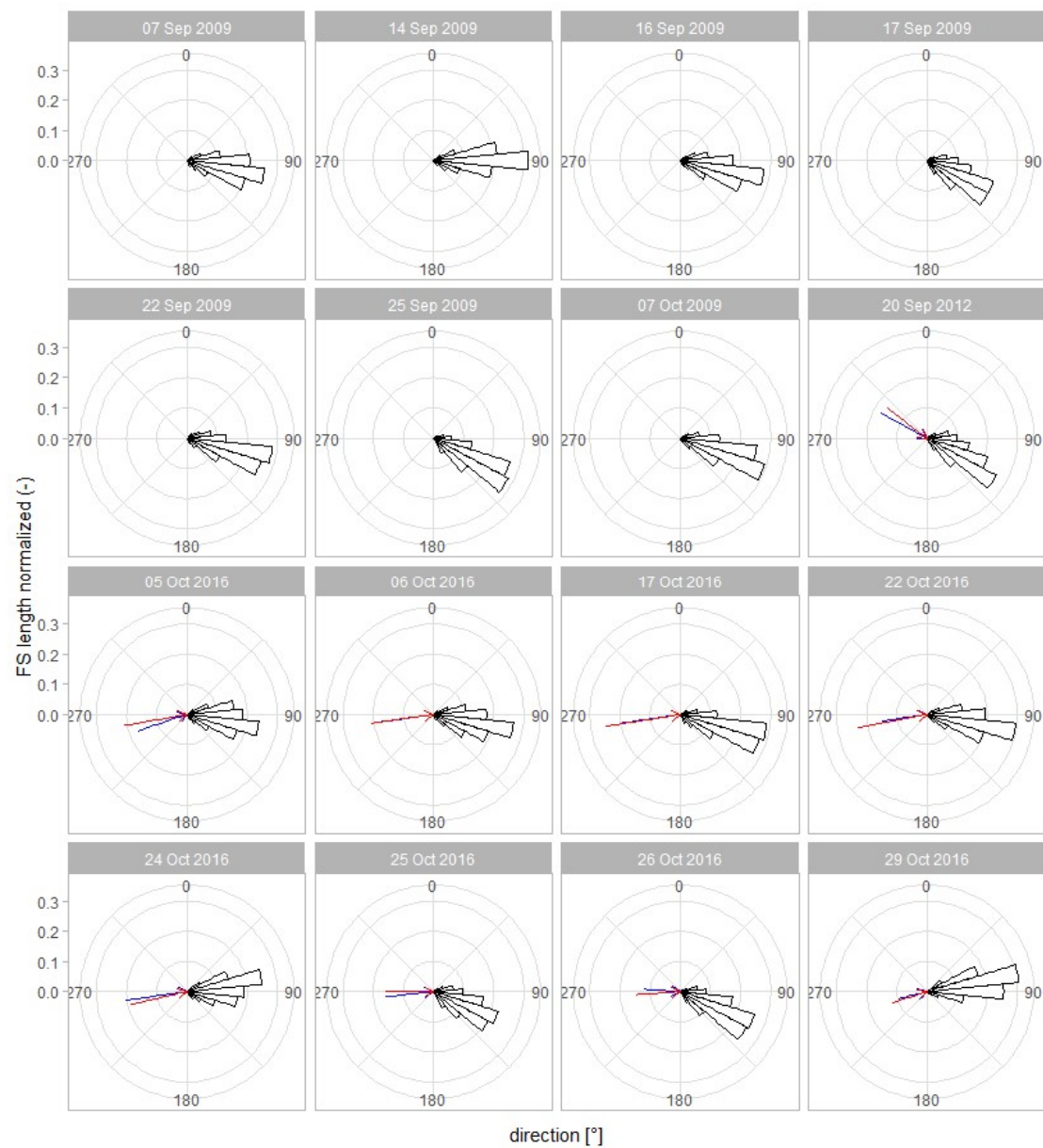
Supplementary Figure S5 (continued)



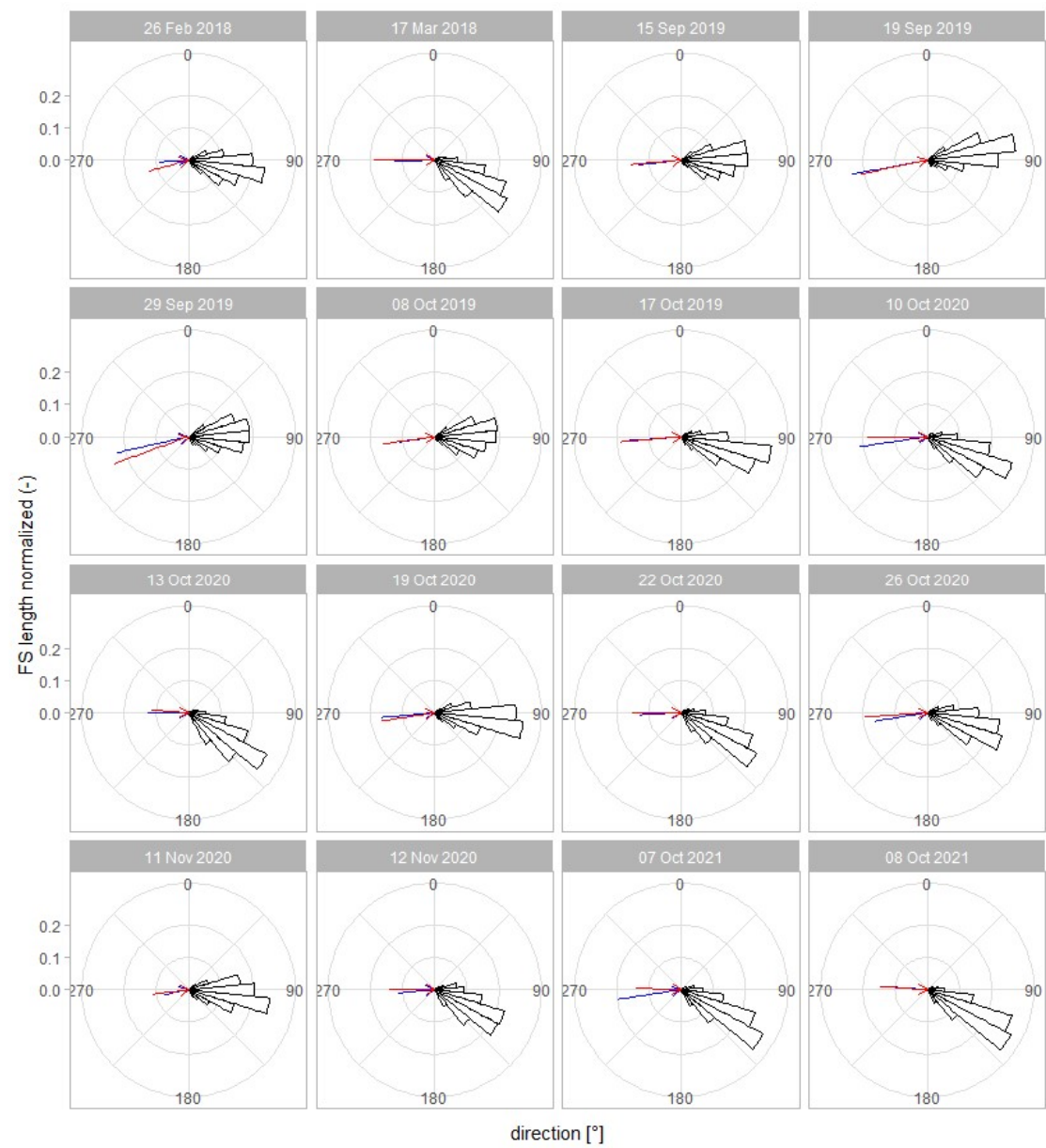
Supplementary Figure S5 (continued)



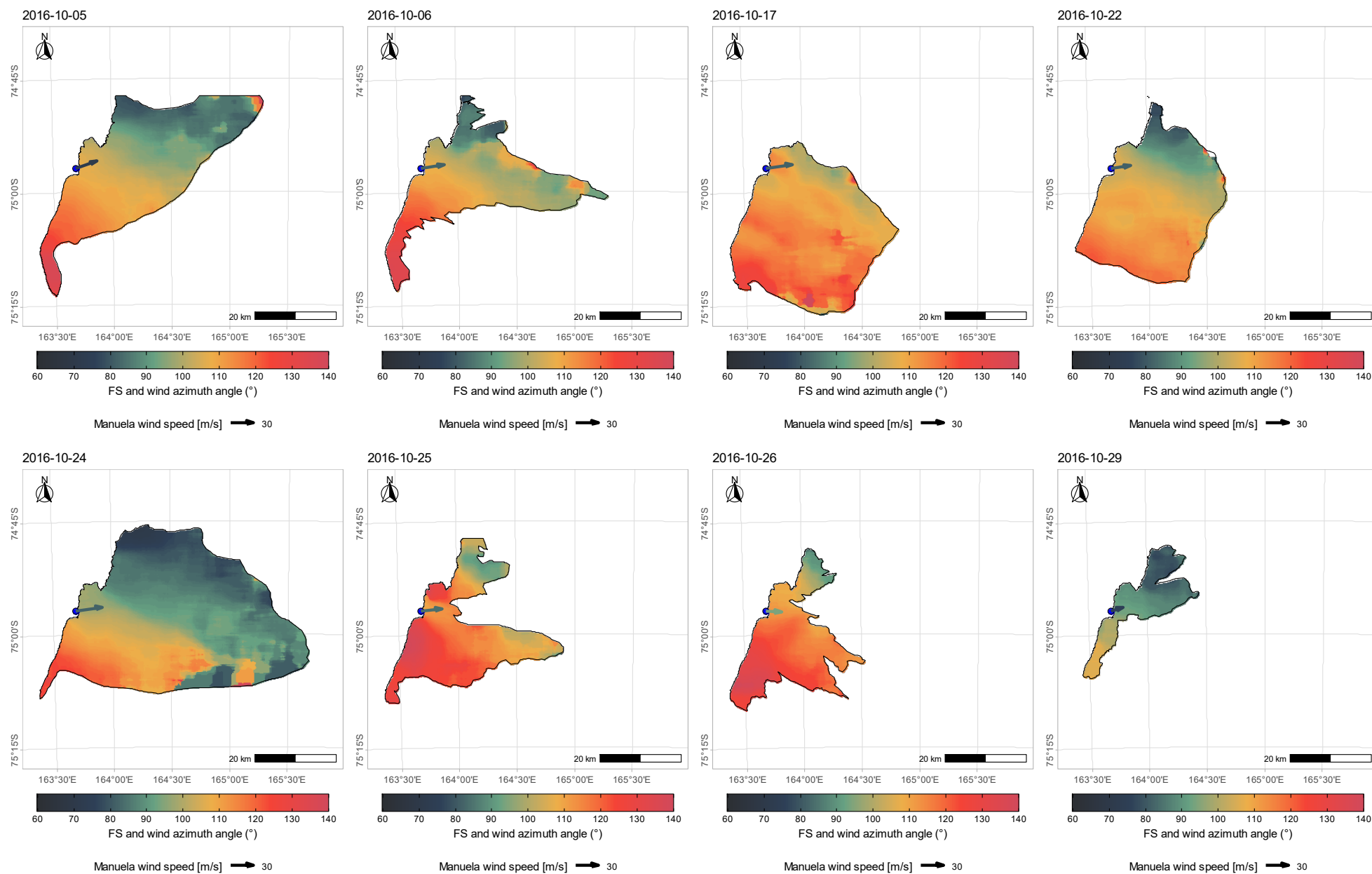
Supplementary Figure S5 (continued)



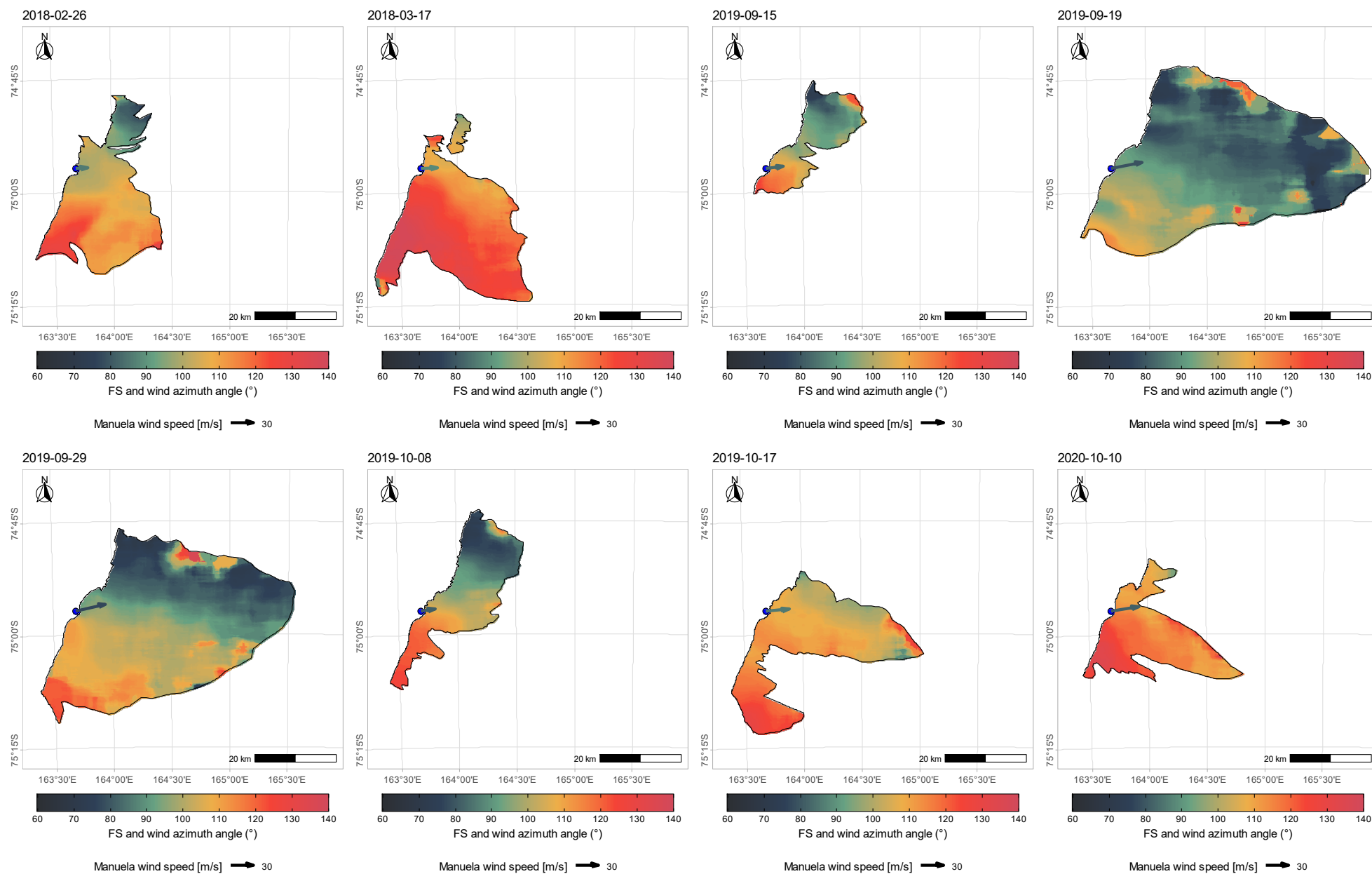
Supplementary Figure S6 (continued on the following page): Histograms of frazil streaks orientation. Arrows indicate the wind direction measured at the Manuela station (red – just before satellite overpass, blue – averaged over 24 h; length of arrow relative to the wind speed; note that they are available only from 2012 onwards)



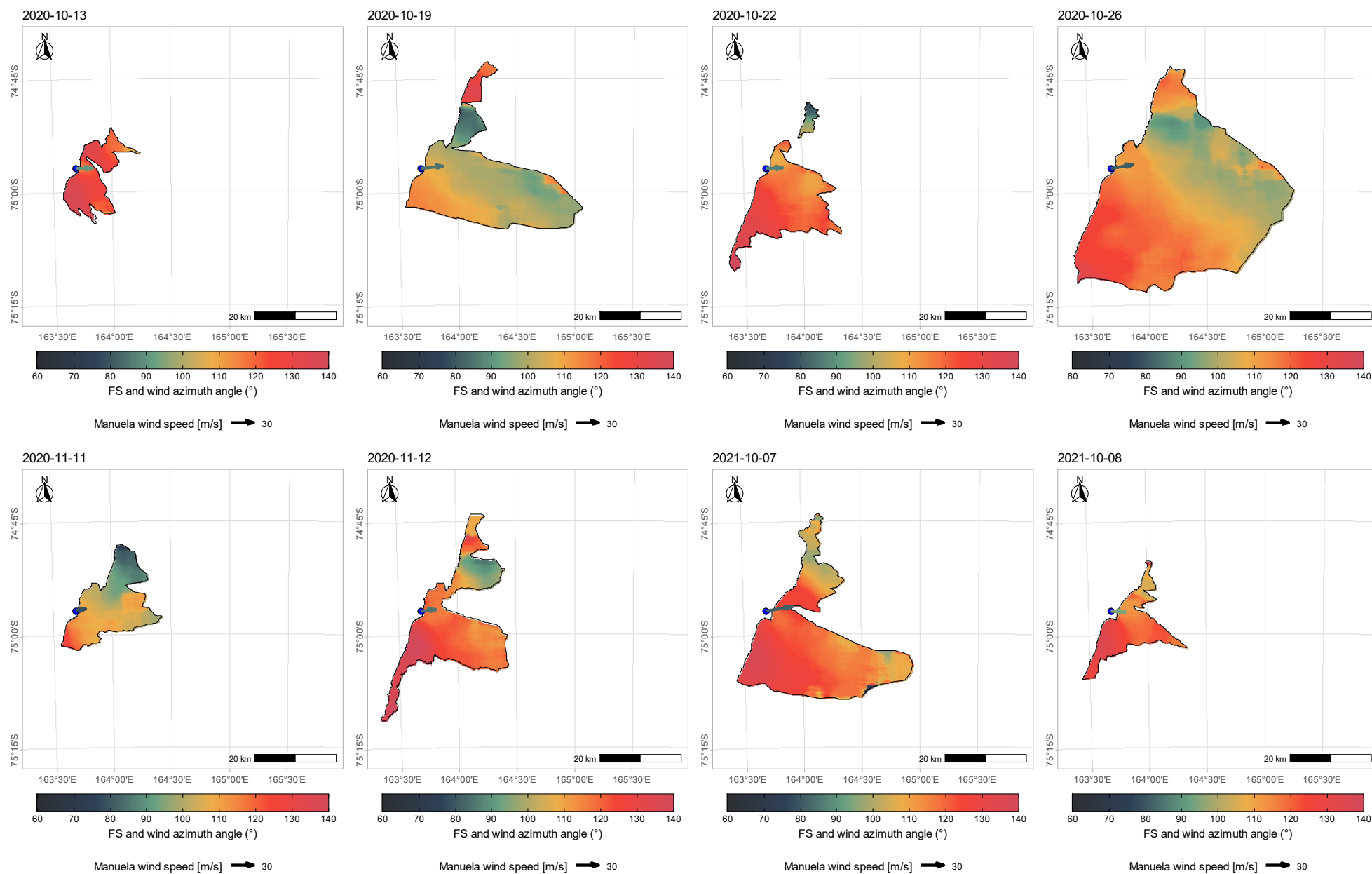
Supplementary Figure S6 (*continued*)



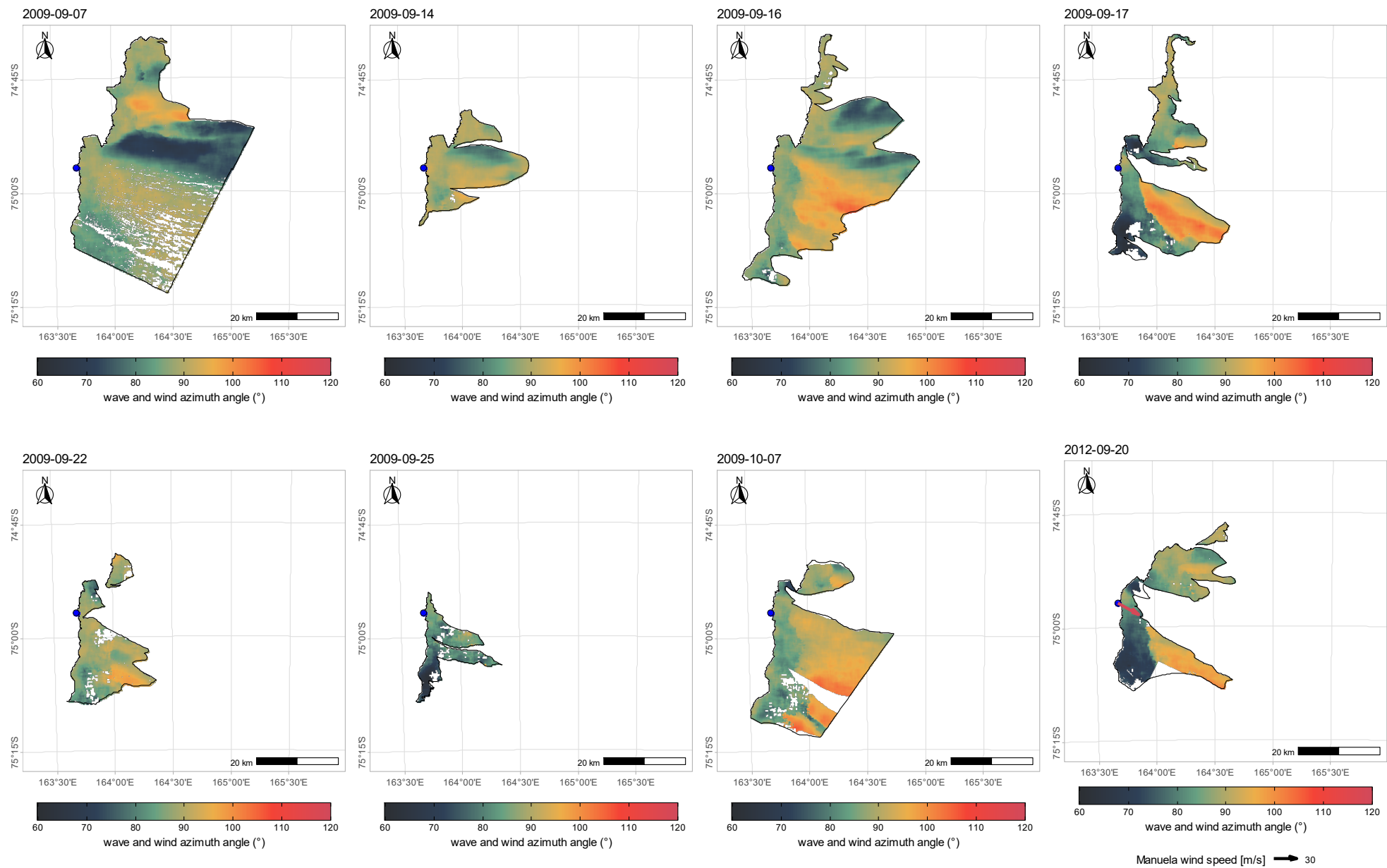
Supplementary Figure S7 (*continued*)



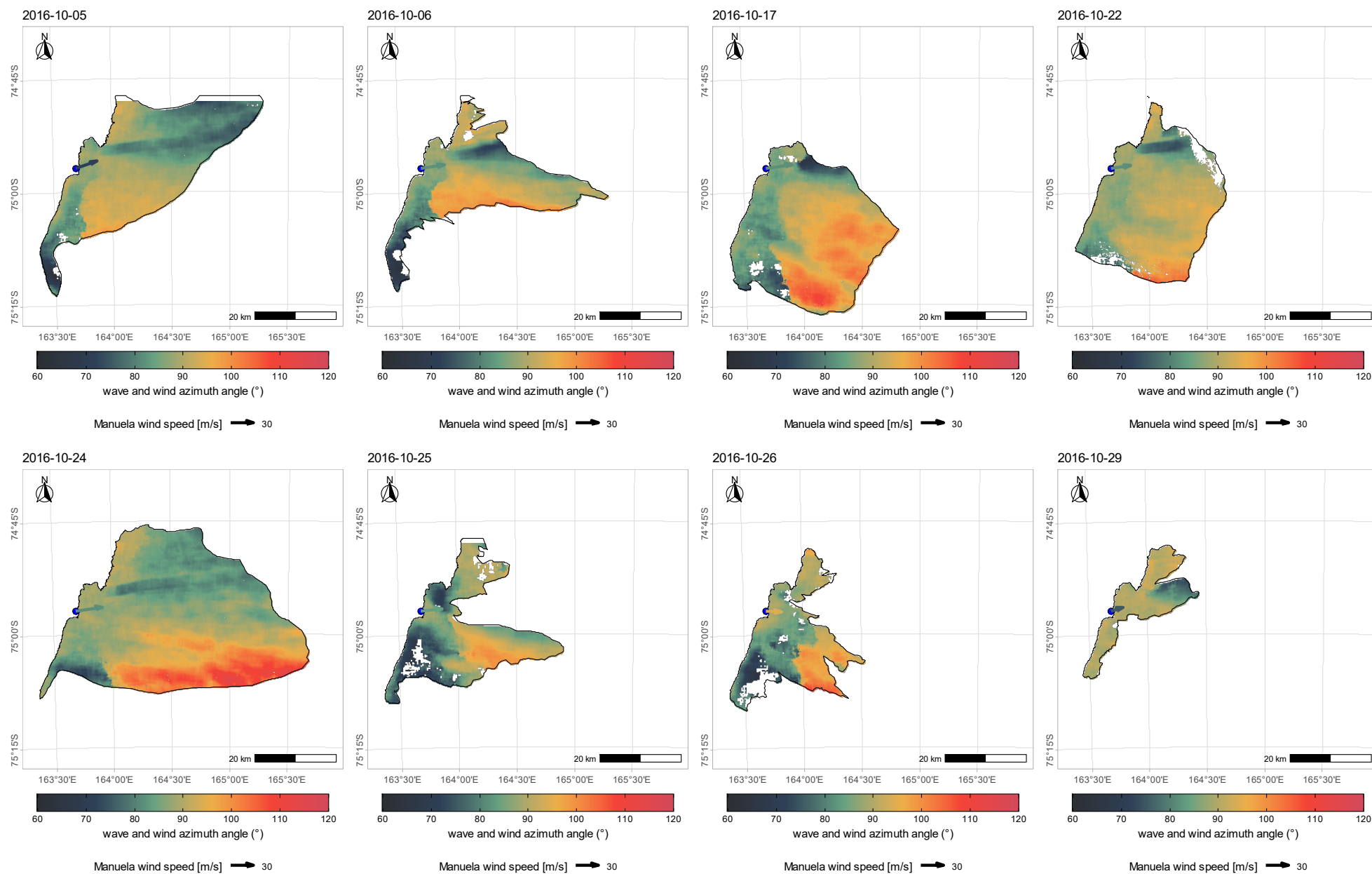
Supplementary Figure S7 (continued)



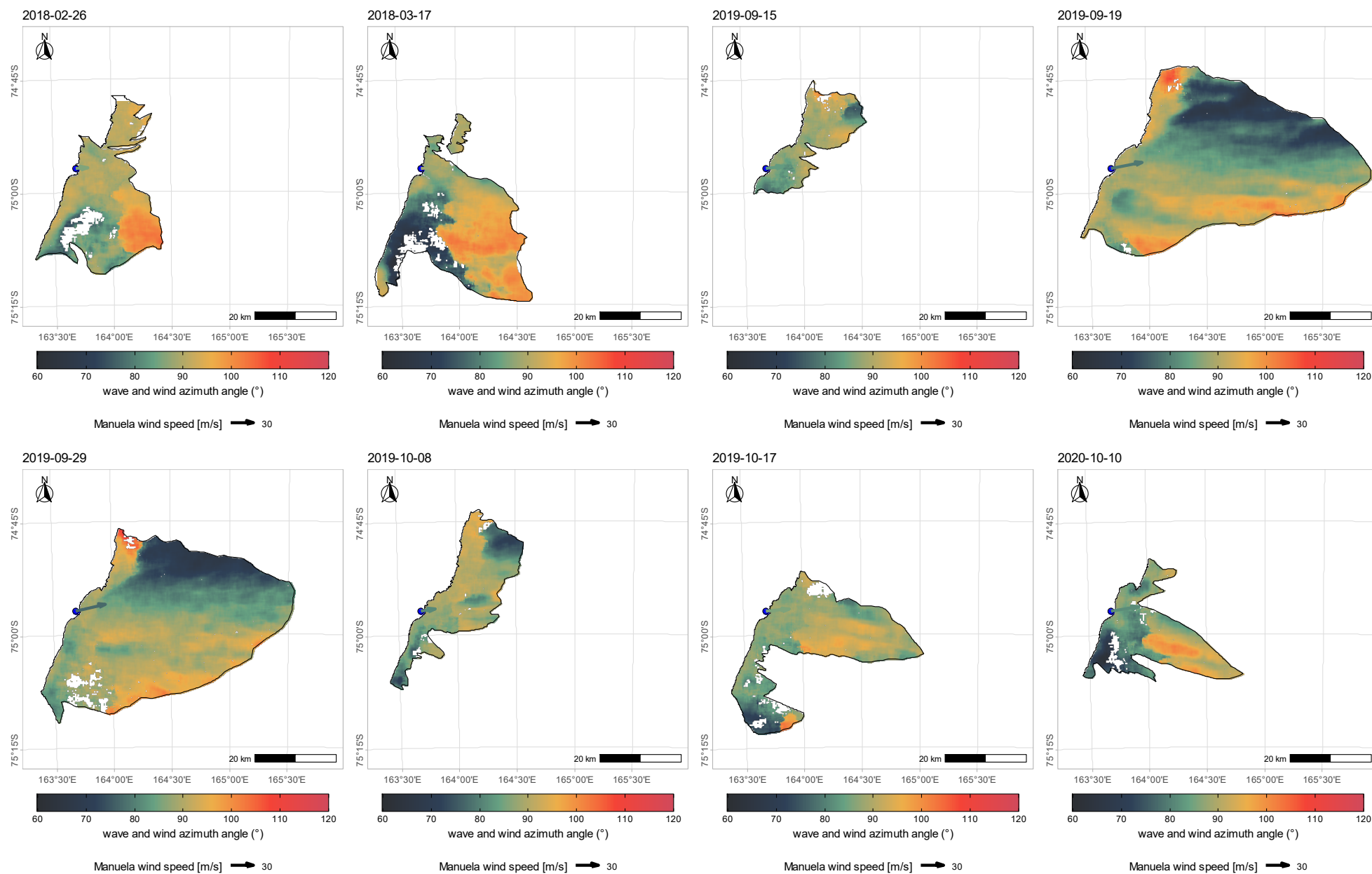
Supplementary Figure S7 (continued)



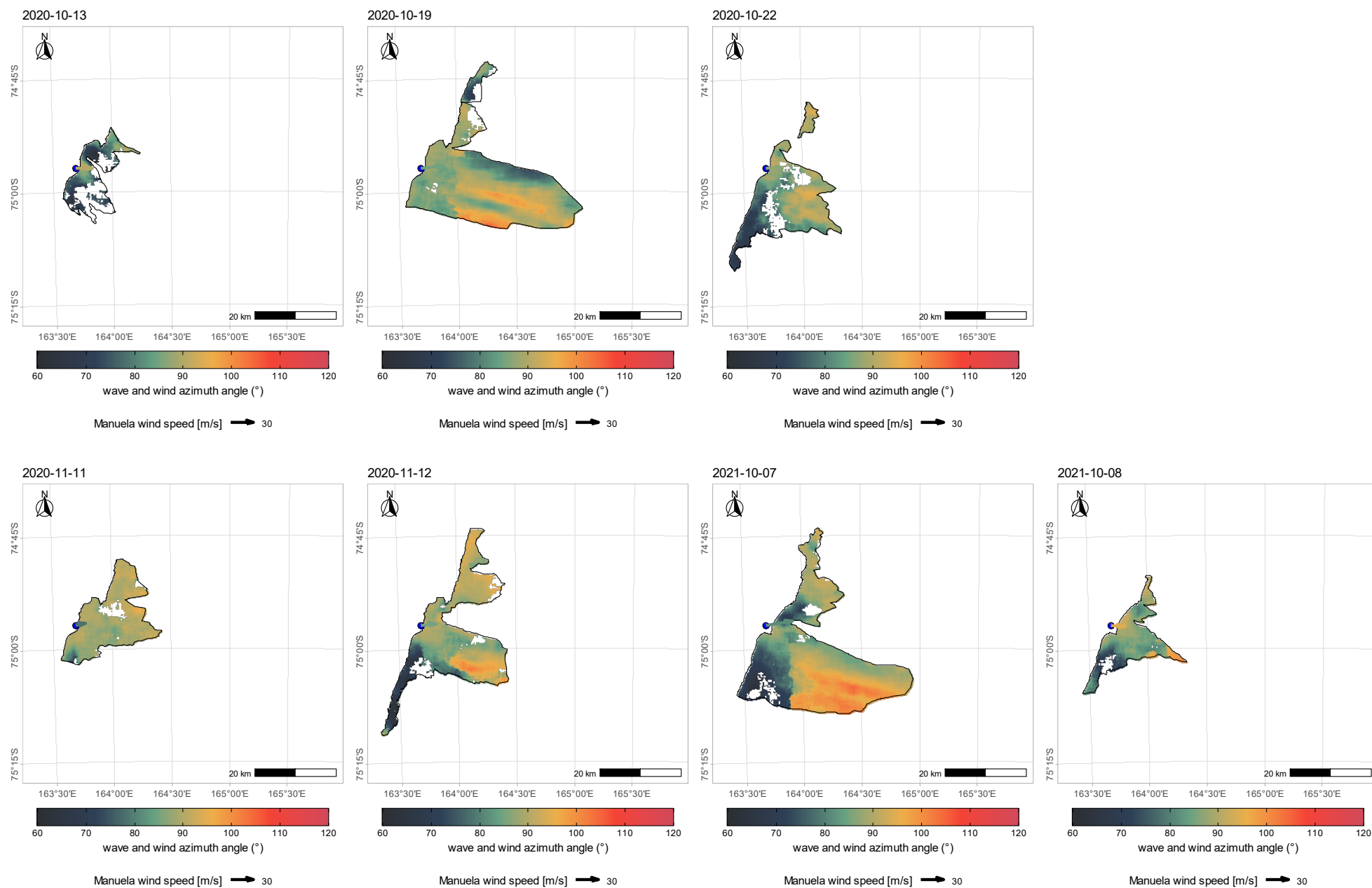
Supplementary Figure S8 (continued on the following three pages): Peak wave direction (in degrees) obtained from the Fourier analysis. Arrows indicate the wind direction measured at the Manuela station (averaged over 24 h)



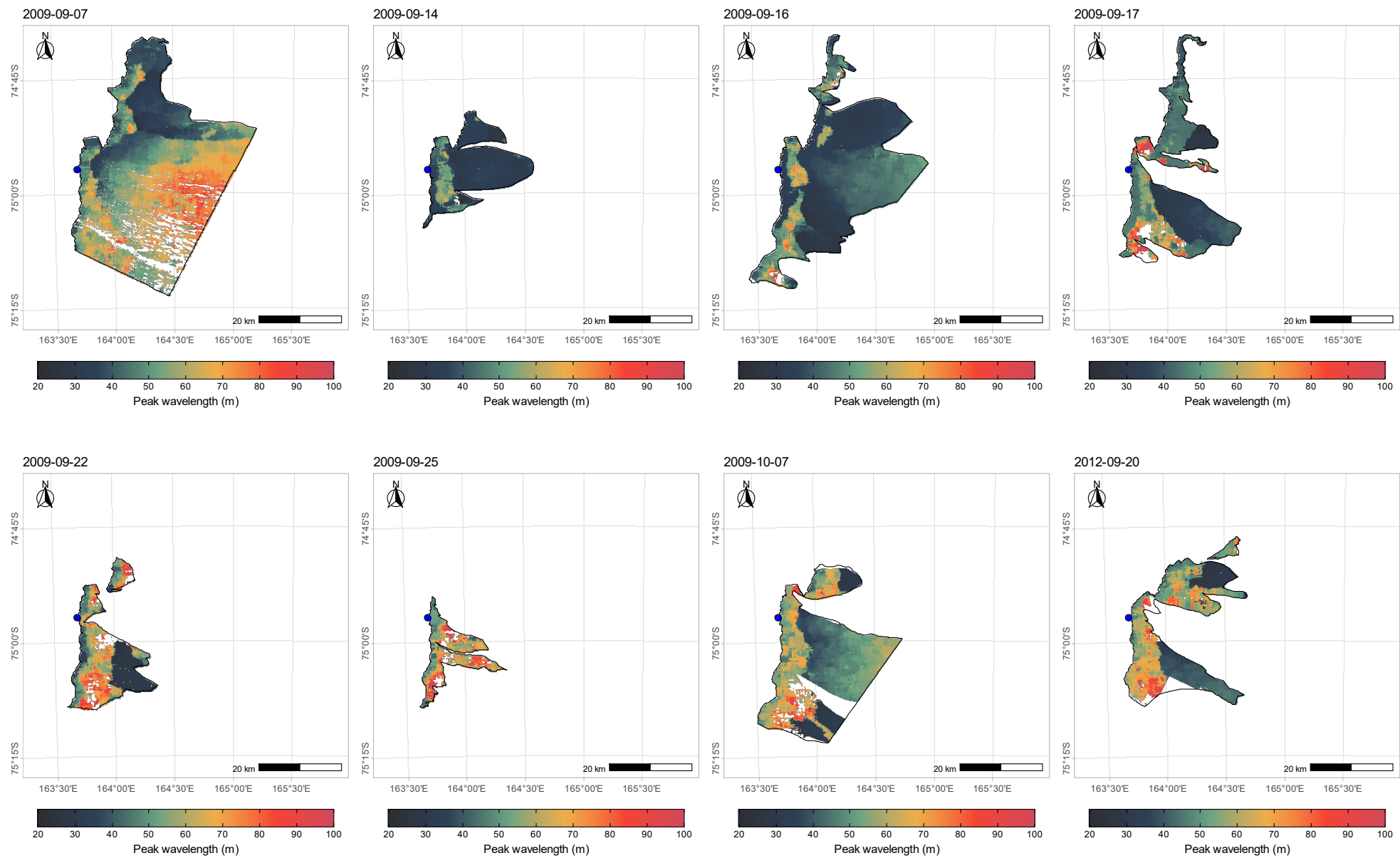
Supplementary Figure S8 (*continued*)



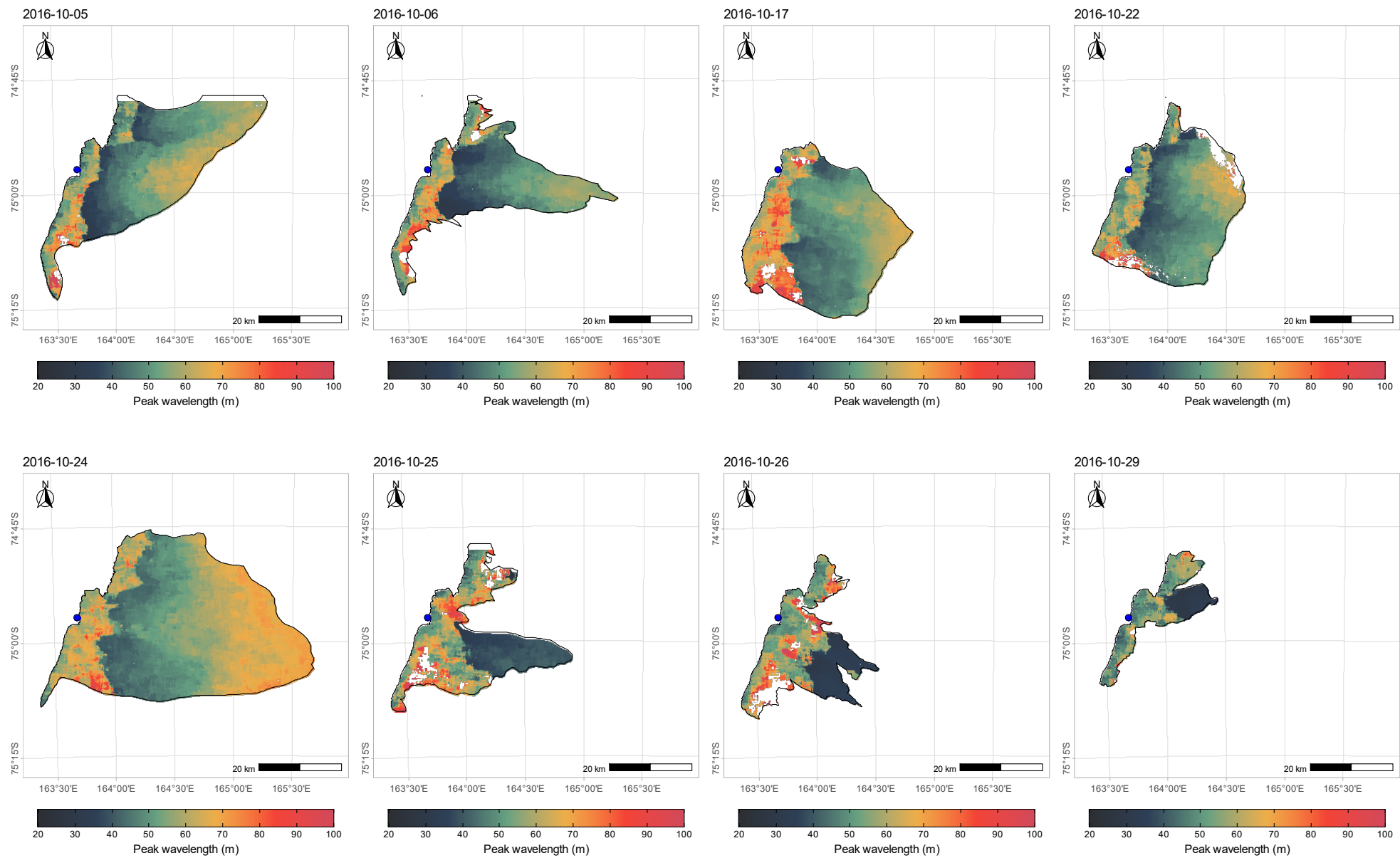
Supplementary Figure S8 (continued)



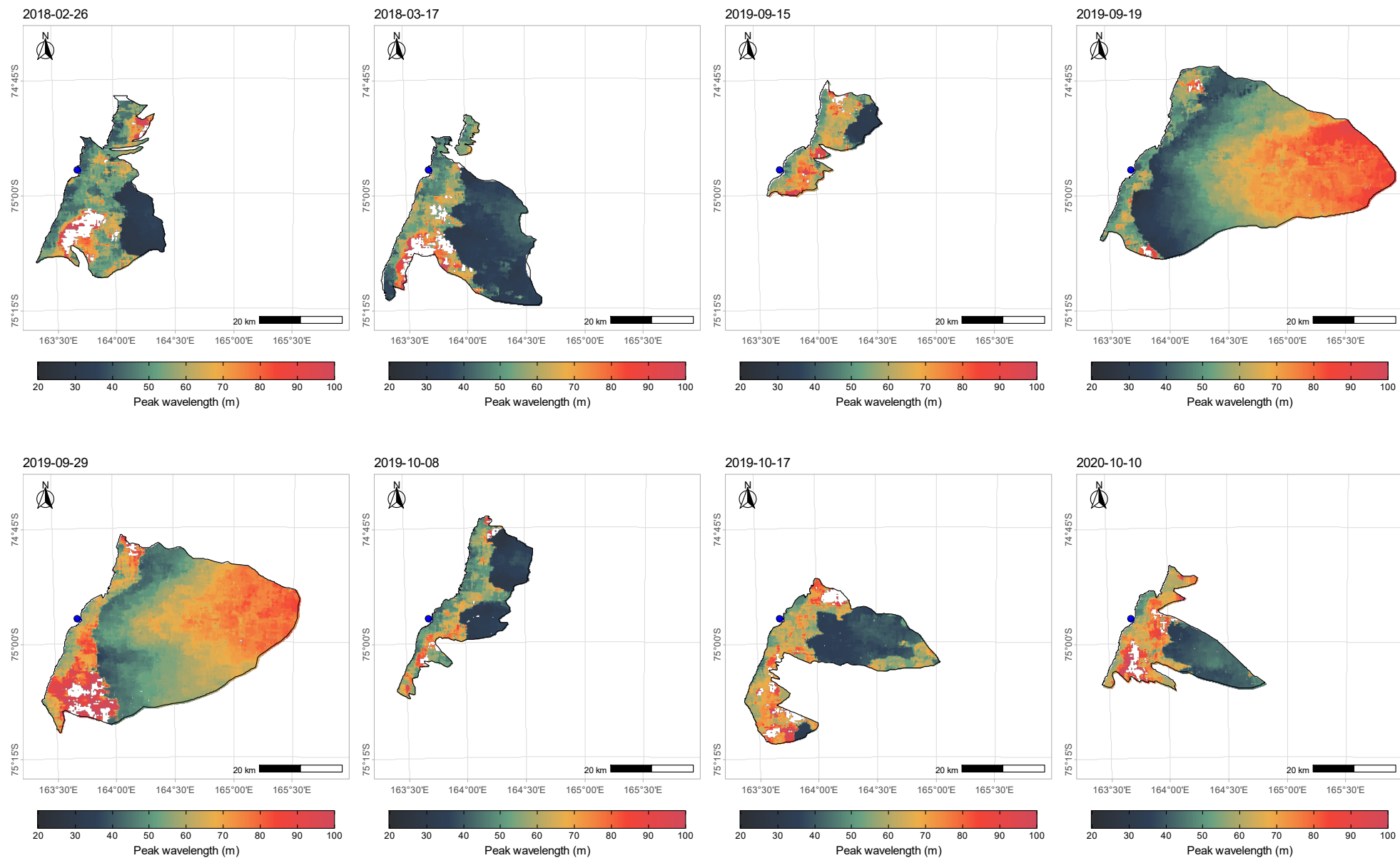
Supplementary Figure S8 (*continued*)



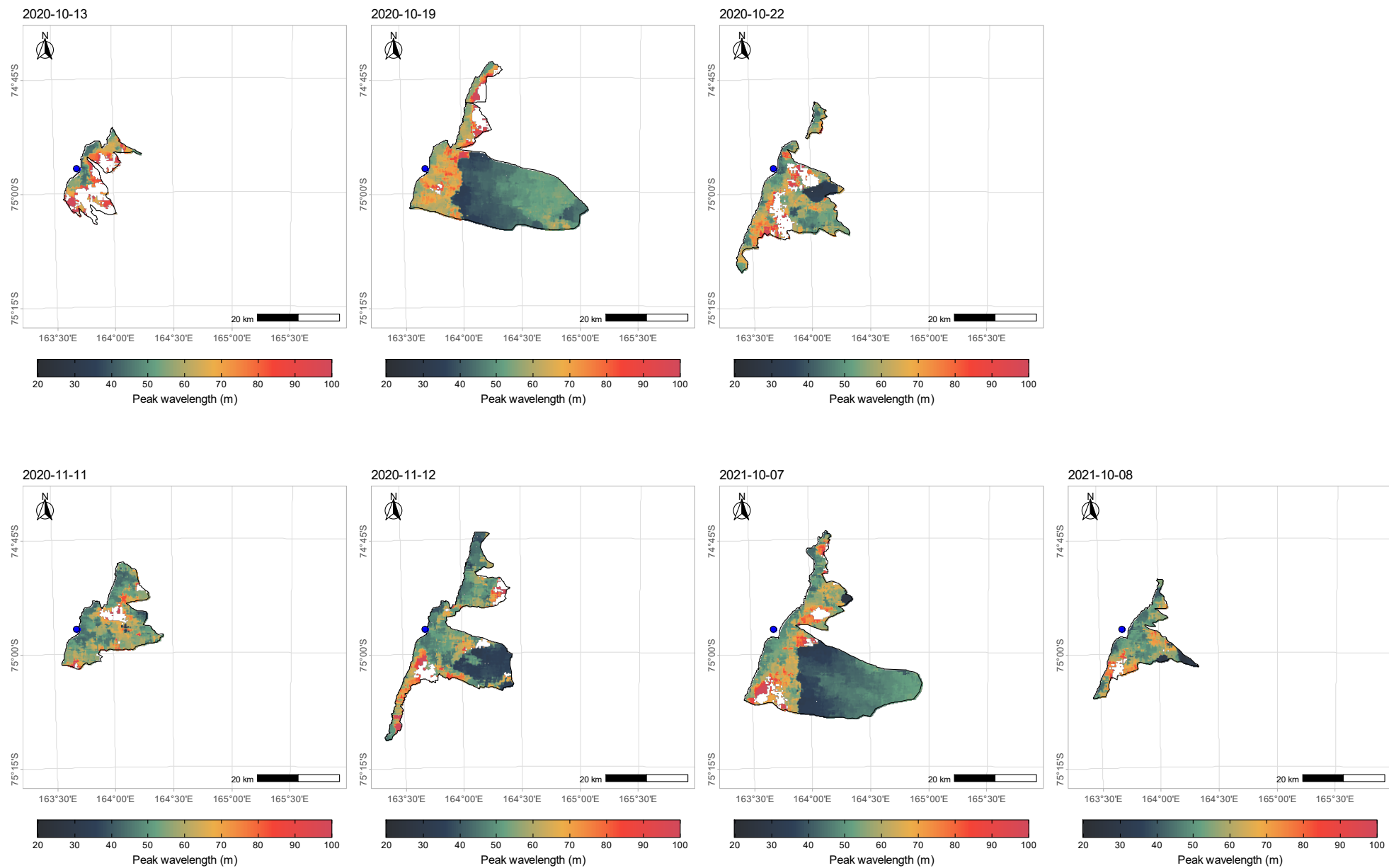
Supplementary Figure S9 (*continued on the following three pages*): Peak wave length (m) obtained from the Fourier analysis.



Supplementary Figure S9 (*continued*)



Supplementary Figure S9 (*continued*)



Supplementary Figure S9 (continued)