# Figure captions

Figure 1. Schematic illustrating functions and typical workflow of the *LandsatTS* package. Each function is briefly described in Table 1, with further details provided in the Supplemental Material and package documentation. *LandsatTS* has primary been used for assessments of interannual variability and trends in vegetation greenness. However, *LandsatTS* facilitates other Landsat time series analyses by providing tools for general data extraction and processing.

Figure 2. Screenshot of a *leaflet* interactive map showing the Noatak National Preserve boundary in northern Alaska, USA, and 100 random sample points within the preserve. Landsat time series data were extracted for each of these sample points. Base map from ESRI World Imagery.

Figure 3. Annual availability of quality screened summer Landsat observations summarized across sample points in the Noatak National Preserve as returned by the function *lsat\_summarize\_data()*. Summaries are based on observations acquired between day of year 152 (beginning of June) and 273 (end of September). Note the limited availability of observations before the year 2000. Lines with points denote median counts while shaded bands encompass the 2.5th to 97.5th percentiles of counts among sample points.

Figure 4. Relationships between Landsat 7 NDVI and both (a) Landsat 5 NDVI and (b) Landsat 8 NDVI using (left panels) original data and (right panels) data that were calibrated using polynomial regression models. Each point is a sample location from the Arctic – Boreal domain with temporally overlapping measurements from pairs of Landsat sensors. Orange diagonal lines depict 1:1 relationships. Model performance metrics are provided in Table 2. Cross-calibration substantially reduces biases between sensors.

Figure 5. Seasonal progression of Landsat NDVI and phenological curves for nine random sample points in the Noatak National Preserve. Each dot is an observation that is colored by the year of acquisition ranging between 1985 and 2022. Each line represents a phenological curve that was fit to observations pooled over a 7-year window centered on the focal year as indicated by the color of the line. Color coding helps illustrate how individual curves are fit to observations. These figures can visually highlight long-term changes in phenology and canprovide a quick visual assessment of how well curves are being fit to observations, especially when the function is run using the parameter *test.run =* TRUE.

Figure 6. Raw estimates of annual maximum NDVI (NDVImax) are biased low when only a few Landsat observations are available from a given growing season, whereas phenologically modeled estimates of NDVImax are minimally impacted by the availability of observations. The figure summarizes how raw and modeled estimates of NDVImax differ from observed NDVImax based on number of observations, as determined using *lsat\_evaluate\_phenological\_max().*

Figure 7. Histogram of relative change in Landsat NDVImax from 2000 to 2022 among sample points across the Noatak National Preserve. Relative changes in percent are calculated based on the Theil-Sen slope and intercept estimates (Table 3).

Figure 8. Screenshot of a *leaflet* interactive map showing the trends in NDVImax from 2000 to 2022 for sample points in the Noatak National Preserve located in northern Alaska, USA. The symbol for each sample point is colored based on a combination of NDVImax trend direction and significance (α = 0.10), and then sized based on the magnitude of relative change. For *leaflet* code simplicity, symbol size varies even for sample points without a significantly significant trend. Base map from ESRI World Imagery.