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This package of scripts (developed January 2026 by Ida Maria Bonnevie at AAU-CPH) support waterbody cooling studies to find turning points with cooling distances and cooling intensities in belts of distance bins calculated from the lake perimeter but within the 30 meters raster grid provided by the Landsat-8 image which provides a raster template for the analysis and the extent of the land surface temperature data (LST).

Scripts:

- 1A: CalculateLST[DATE] calculates LST for the specific Landsat-8 image date. The Landsat-8 input band data is located in subfolders called landsat[DATE]
- 1B: Imperviousness transforms imperviousness density 2018 to the study area to be used as a parameter in correlation studies with cooling intensity
- 1C: Waterbody_statistics_[DATE] takes LST from the selected date as input and calculates turning point information (cooling distances and cooling intensities) for the date in focus for different subsets of waterbodies and plot the individual lake patterns as well as the mean trends, together with log-linear models of the cooling trends.
- 2: mapped_cooling_effects_[DATE] takes LST as input as well as other background variables (imperviousness (calculated in 1B), NDVI and MNDWI (calculated in 1A as part of the LST dataset) as input. It calculates Moran's I and different maps of the cooling patterns. It also provides a few Ordinary Least Square statistics and scatterplots.
- 3A: mapped_compare_across2018_2019 calculates difference maps of how the cooling patterns changed in 2019 compared with 2018 (red for decreasing cooling; green for increasing cooling).
- 3B: mapped_compare_across2019_2020 calculates difference maps of how the cooling patterns changed in 2020 compared with 2019 (red for decreasing cooling; green for increasing cooling).
- 3C: mapped_compare_across2018_2020 calculates difference maps of how the cooling patterns changed in 2020 compared with 2018 (red for decreasing cooling; green for increasing cooling).