

Yamal Peninsula, Russia: Landsat TM Mosaic Image (1:1M scale), Land-Cover Maps and NDVI Maps of the LCLUC Study Areas (1:250K-1:300K scales)

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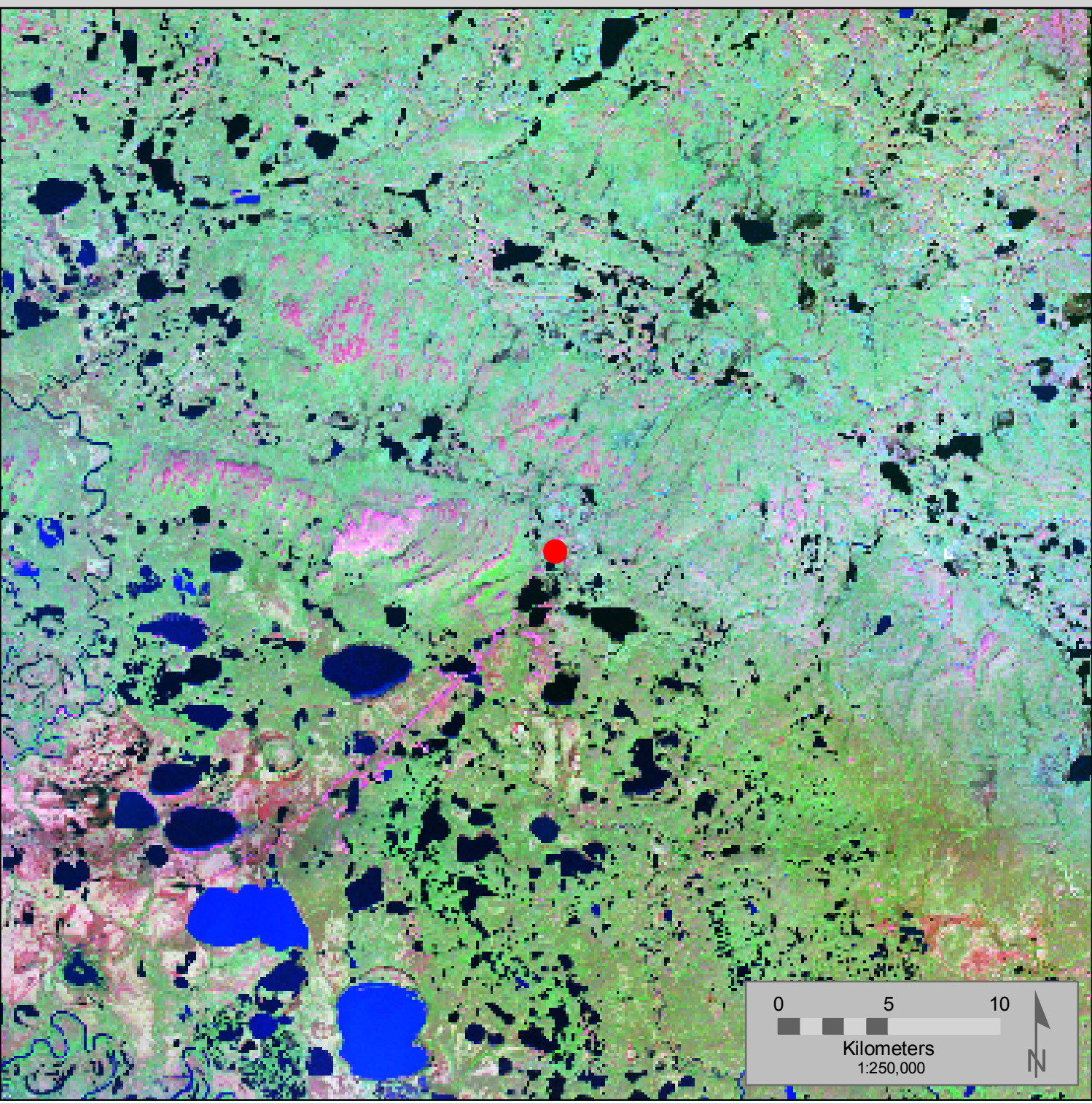
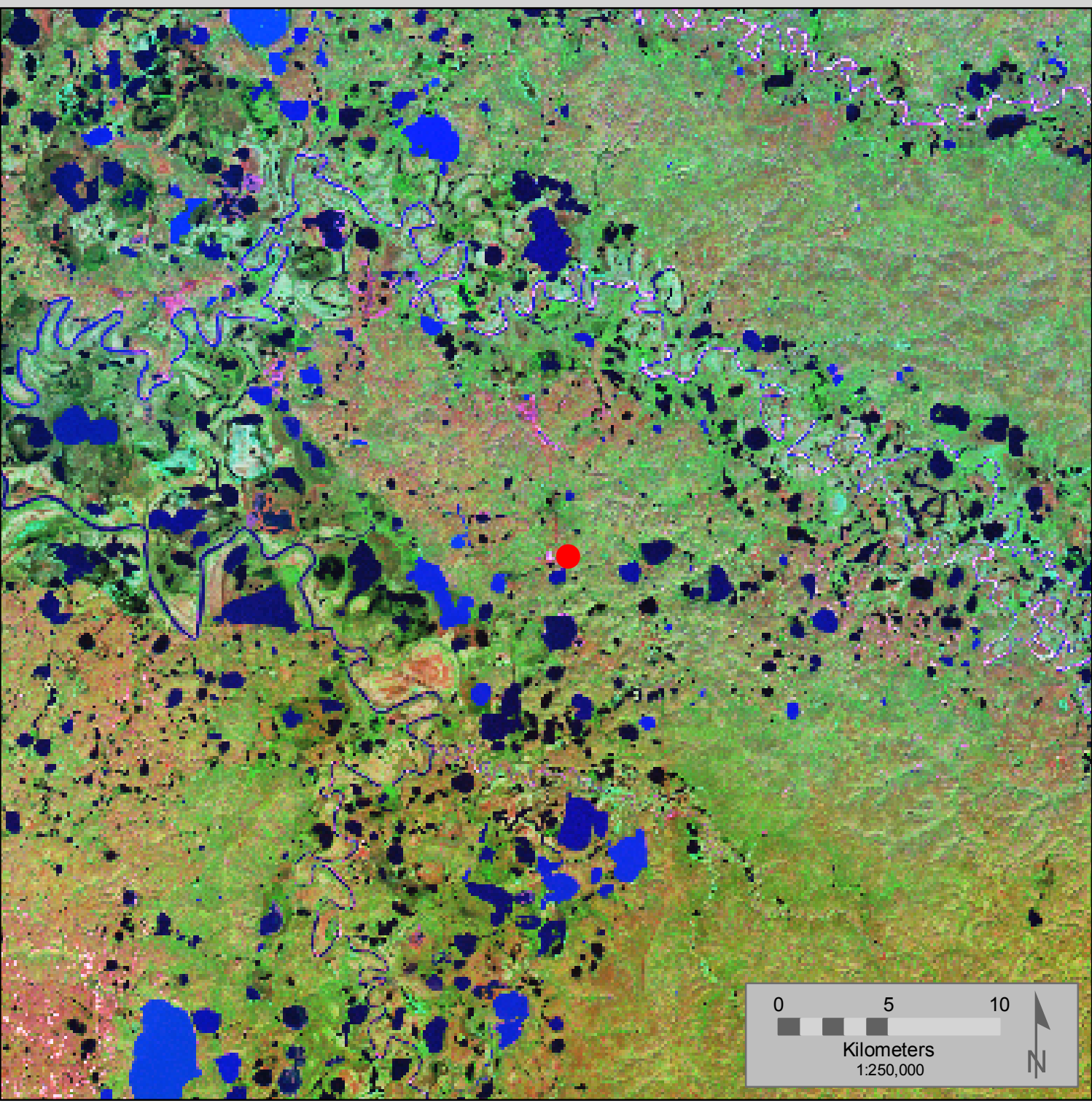
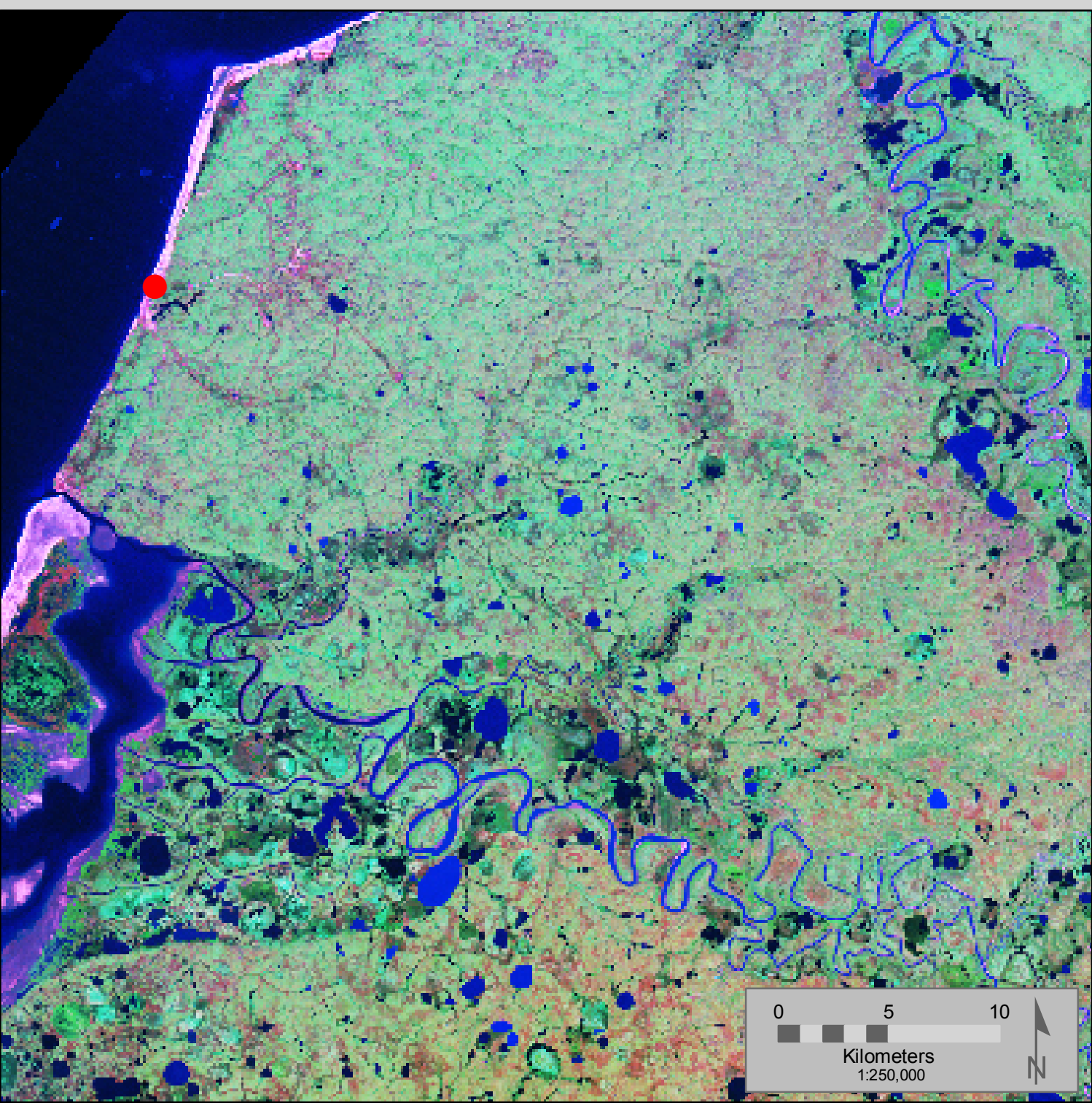
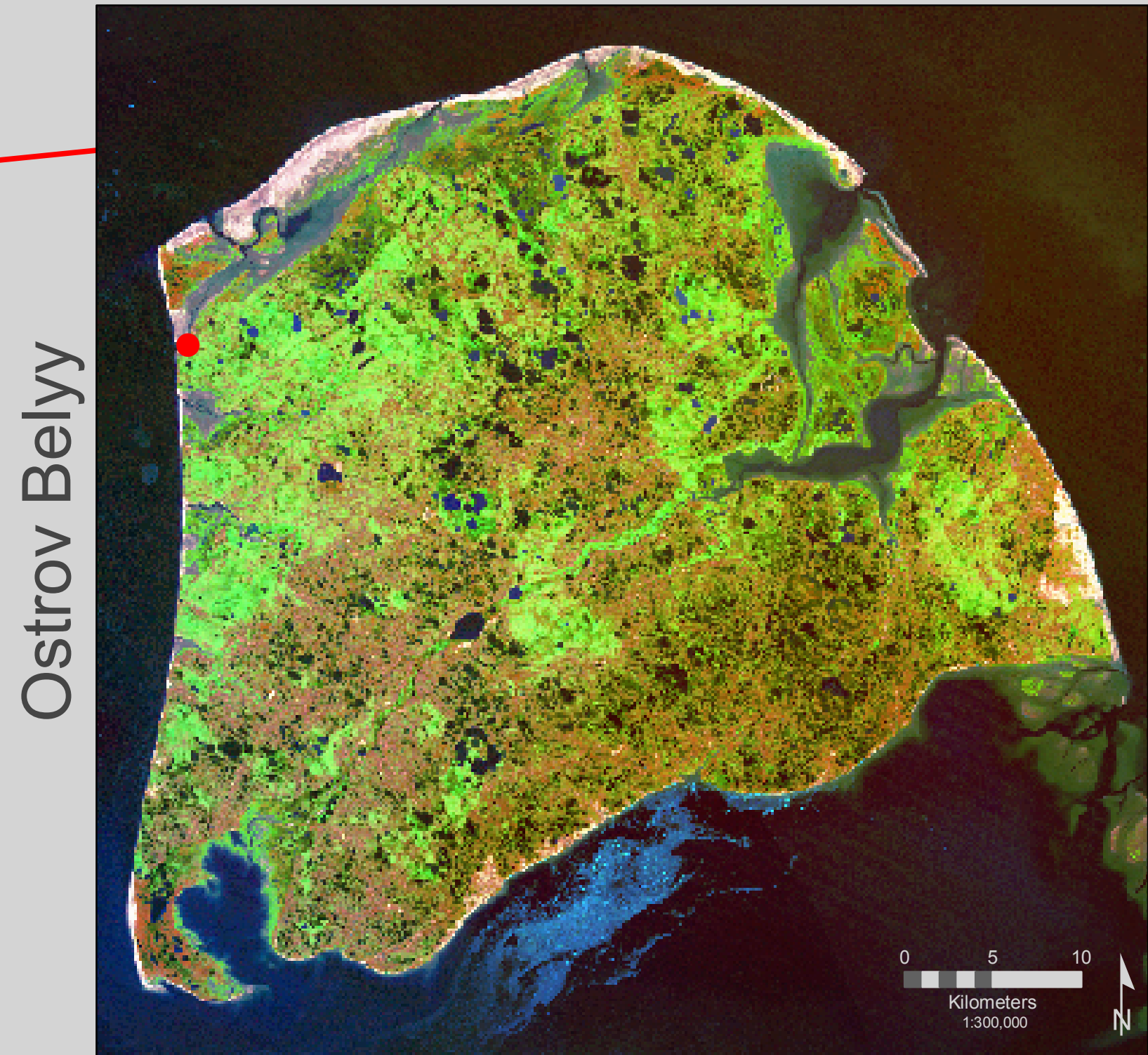
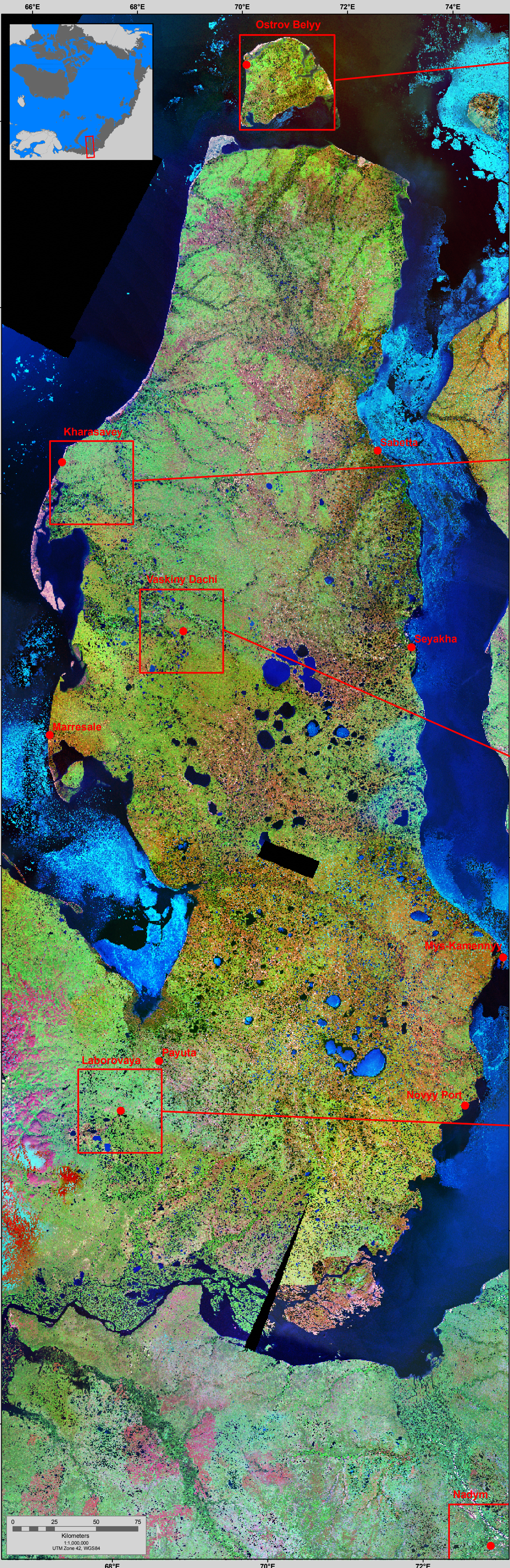
Alaska Geobotany Center, University of Alaska Fairbanks, Fairbanks, AK. <http://www.geobotany.org/>
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Landsat TM Orthorectified Mosaic

False color image of the Yamal Peninsula created from Landsat TM Orthorectified Mosaics (acquired 1986-1995). The false color composite displays Landsat TM bands 7 (2080-2350 nm; Mid-Infrared), 4 (760-900 nm; Near-infrared), and 2 (520-600; green) as red, green and blue channels. Vegetated areas are displayed as shades of green. Water is displayed as black and dark blue. Barren areas are displayed as shades of magenta and pink. Study regions are indicated by red squares (approximately 50x50 km). Yellow lines display the boundary of the Russian Landschaft units. The approximate treeline boundary is southern extent of the Landschaft polygons. Field sites are indicated by the red dots within the study regions (red boxes).

False color image of the Yamal Peninsula

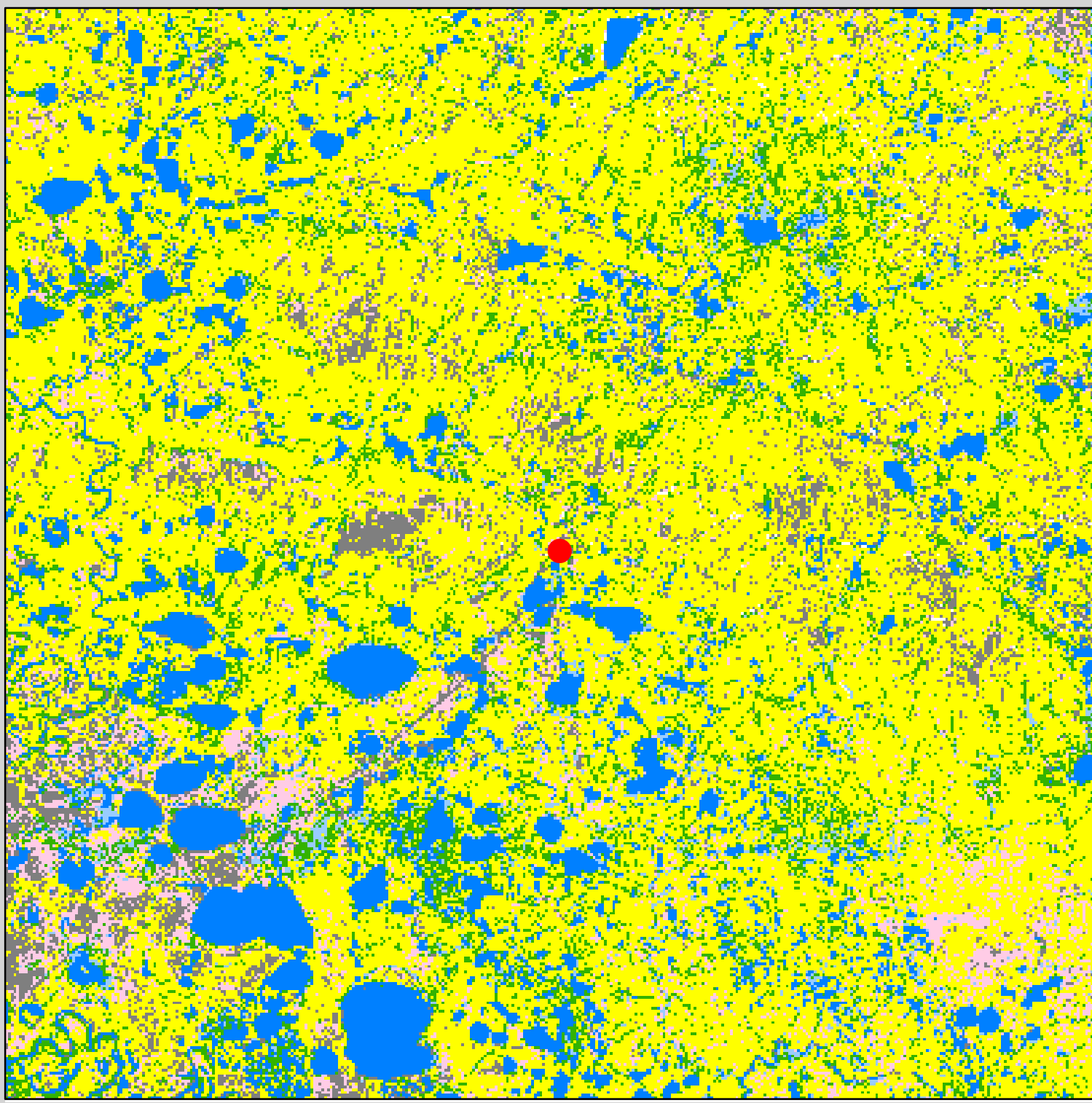
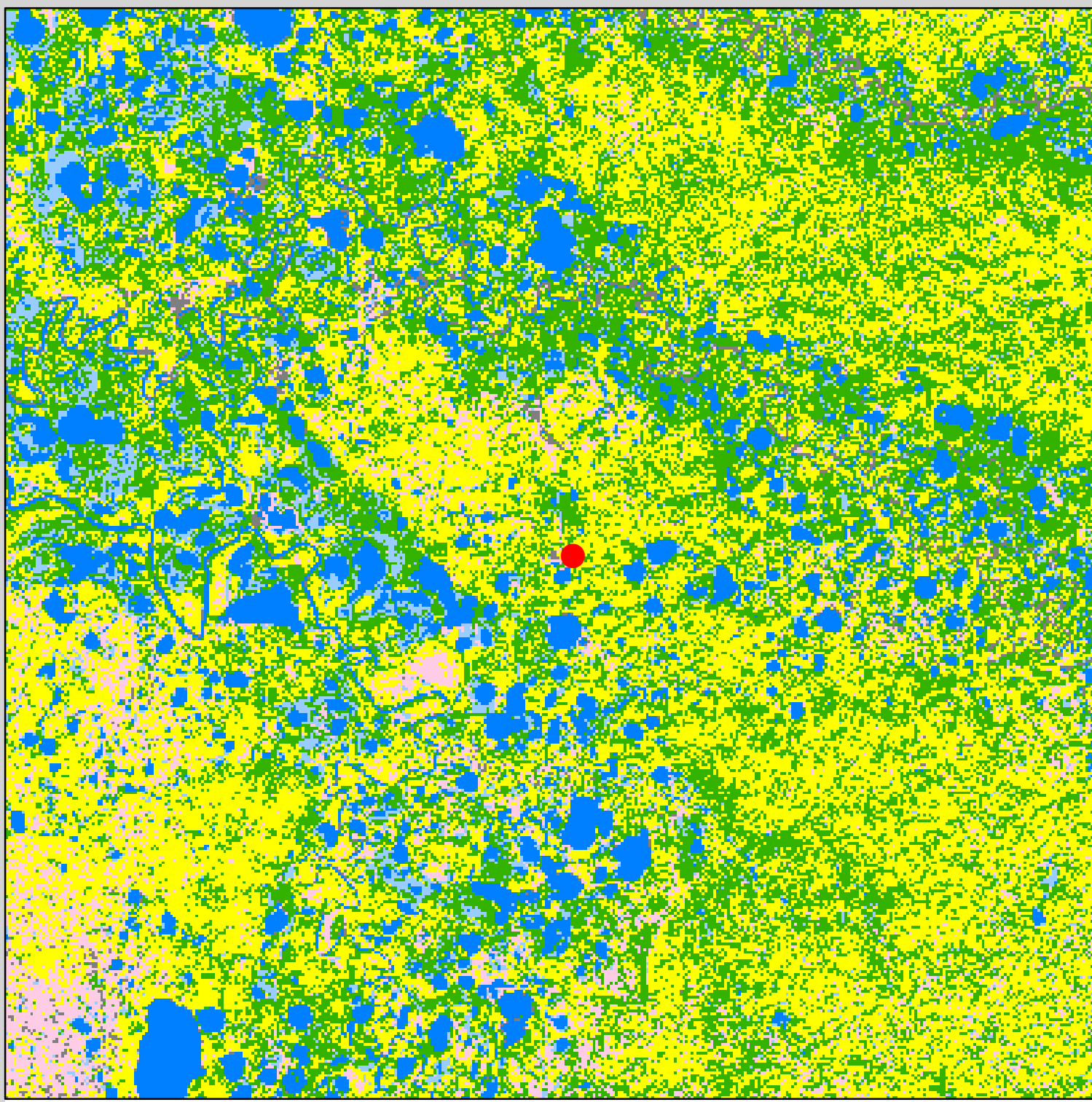
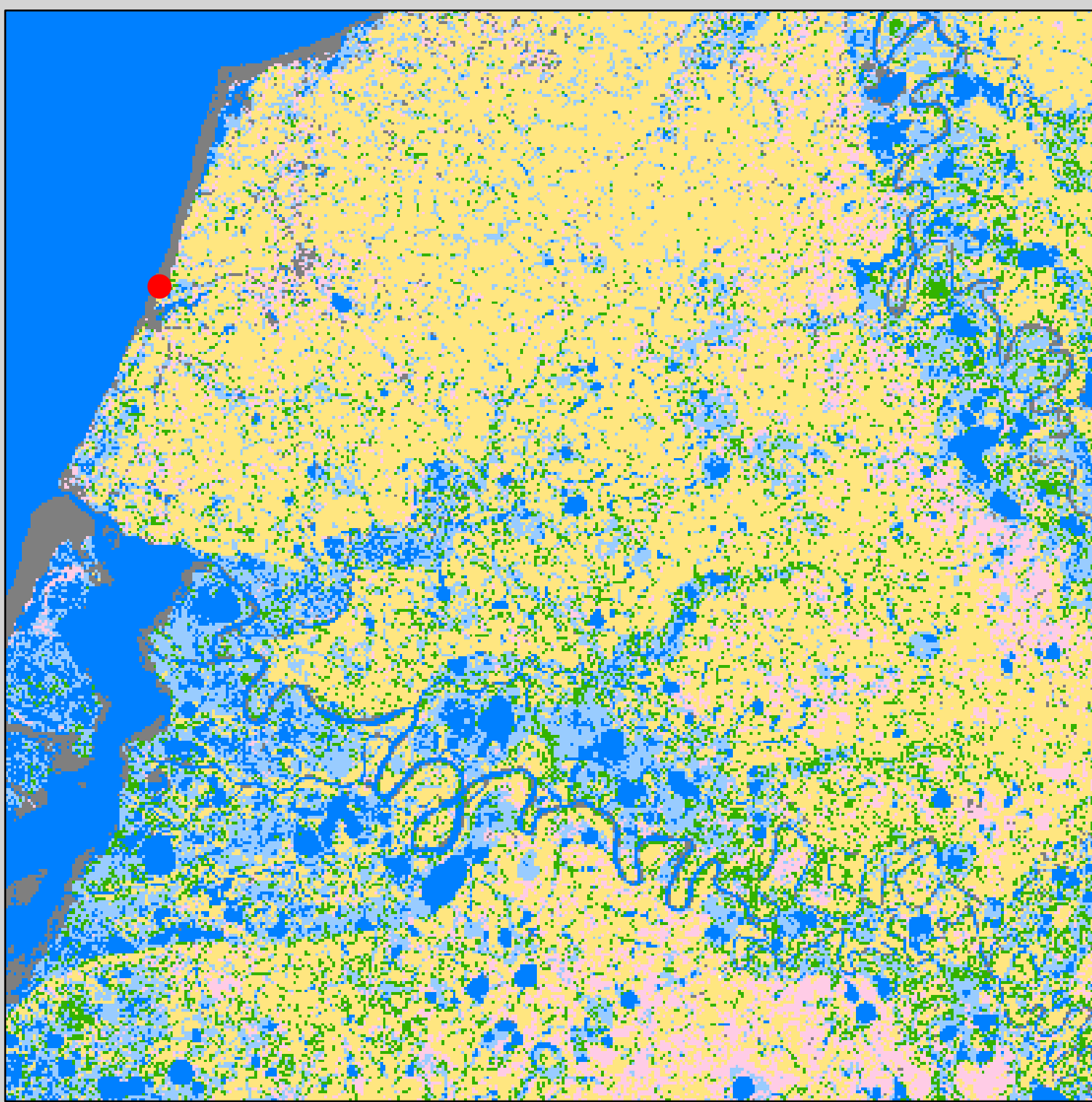
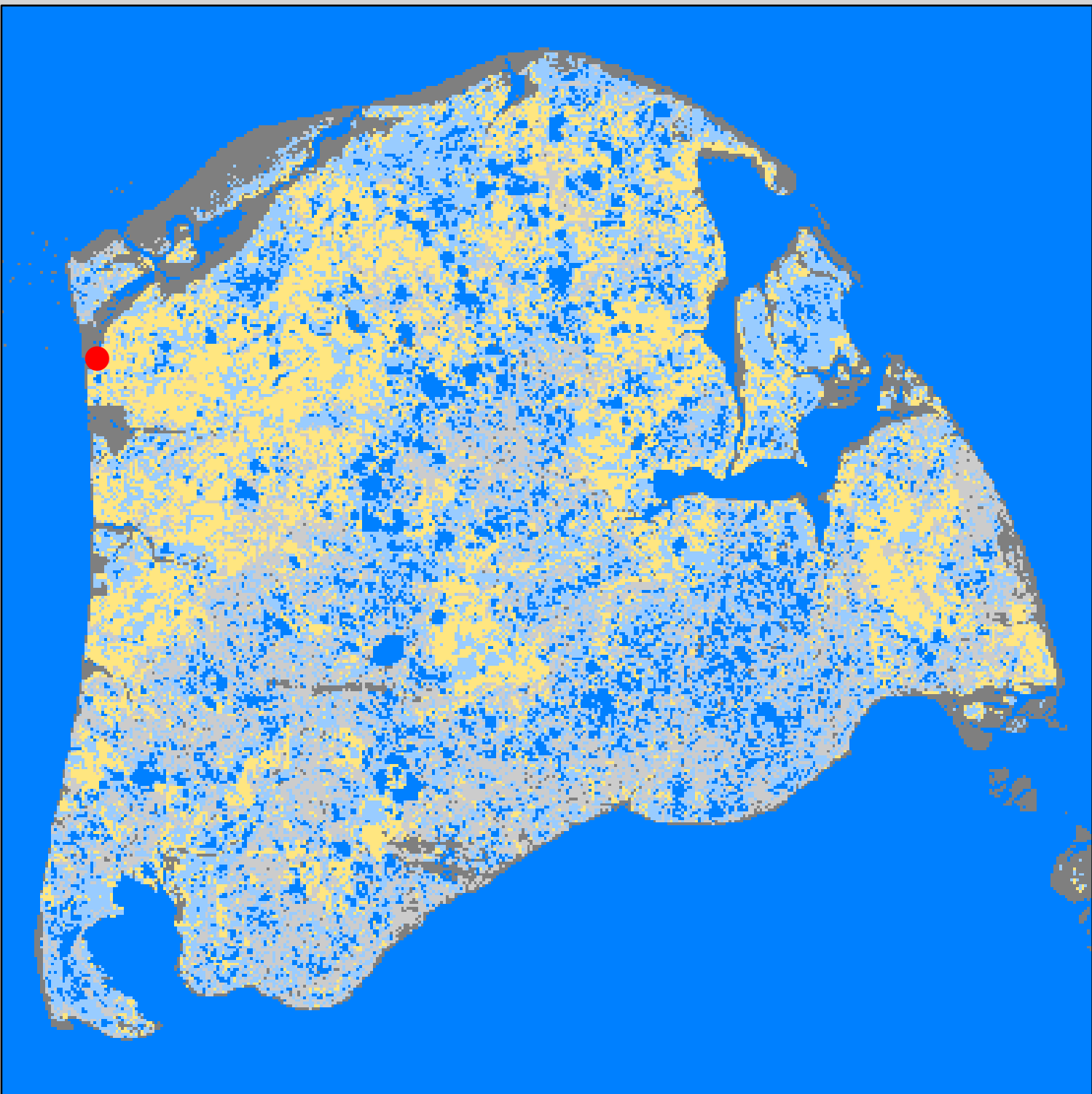
Detailed View of Approximately 50x50 km Study Regions



Land-Cover Map

An unsupervised classification was performed on bands 1-3 of the Landsat Orthorectified Mosaic image (TM bands 7, 4, 3) using the Iso Cluster and Maximum Likelihood algorithms (ArcGIS 9.3 software). Pixels were grouped into 35 clusters based on their spectral similarity. Each cluster was then assigned to one of 7 land-cover classes with names and colors modified from those of the Circumpolar Arctic Vegetation Map (Walker et al. 2005). The eight landcover classes described for Ostrov Belyy (Maier and Walker, 2010) have been simplified to five classes and are shown below.

Simplified Land-Cover Classification for Ostrov Belyy



Credits:
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Data Sources:
Landsat TM Orthorectified Mosaics data collection, USGS Earth Resources Observation and Science Center (EROS), Scenes: N-42-65_LOC (Starting Date: 19860627, Ending Date: 19950528) and N-42-70_LOC (Starting Date: 19860620, Ending Date: 19930628). Online Linkage: <http://earthexplorer.usgs.gov>

References:
Walker, D.A., Raynolds, M.K., Daniels, F.J.A., Ehnarson, E., Elveback, A., Gould, W.A., Katenin, A.E., Khokhlov, S.S., Markon, C.J., Melnikov, E.S., N.G., M., Talbot, S.S., Yurtsev, B.A., and CAVM Team. 2005. The Circumpolar Arctic Vegetation Map. *Journal of Vegetation Science*, v. 16, p. 287-292.

Walker, D.A., Oreshkov, P., Frost, G.V., Matyash, G., Epstein, H.E., Leibman, M.O., Khtun, O., Khomutov, A., Danner, R., Gobroski, K., and Maier, H.A. 2009. The 2009 Yamal Expedition to Ostrov Belyy and Kharp, Yamal Region, Russia. Alaska Geobotany Center Data Report. NASA Grant No. NNG06GEOA, p. 49.

Normalized Difference Vegetation Index

The Normalized Difference Vegetation Index (NDVI) is an index of photosynthetic capacity that can be related to plant biomass. NDVI is calculated as: $NDVI = (NIR - R) / (NIR + R)$, where NIR and R are the spectral reflectance values of the near-infrared and red bands, respectively. The NDVI values displayed below were obtained from the CAVM (Walker et al. 2005) and were originally derived from 1 km AVHRR imagery using bands 1 (red, 580-680 nm) and 2 (near-infrared, 725-1100 nm). Water and barrens are generally displayed as black and sparsely vegetated areas are displayed in gray. Vegetation density increases with darker shades of green. Live biomass values were scaled linearly with NDVI from 0 g/m² to >500 g/m², based on biomass information from (Walker et al. 2009), low biomass values occur in the dry areas, intermediate values in moist areas, and highest values in the wet tundra sites.

