



NSSI Remote Sensing Workshop

Arctic LCC Projects and Remote Sensing Data Used, Generated, and Needed.

Project Title	Remote Sensing Data		
	Used	Generated	Needed
2010-01 Predicting future potential climate biomes for the Yukon, Northwest Territories and Alaska	AVHRR		
2010-02 Modeling Shorebird Distribution on the North Slope	MODIS NDVI, National Elevation Dataset		landform, snow cover, maximum surface water distribution and change rates, higher resolution DEM
2010-05 Alaska Integrated Ecosystem Model	MODIS data (land cover)		IEM thermokarst module needs updated permafrost map with estimated ice content, and landform form map (e.g. polygonized terrain) for initial conditions
2010-07 Long-term monitoring of the impacts of climate change on the glaciers and rivers in the Arctic National Wildlife Refuge	LiDAR DSM	Photomosaic of Hulahula and Jago river deltas at 20cm resolution;	
2010-09 Thermokarst Lake Drainage – vulnerability to climate change and prediction of future lake habitat distribution on the North Slope	Airborne IfSAR DSM	Derived Digital Surface Model for Western ACP.	

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2011-01 Mapping suitable Snow Habitat for Polar Bear Denning along the Beaufort Sea Coast of Alaska	High resolution digital elevation models from LiDAR, National Land Cover Data.		
2011-02 Changing Storm Conditions in Response to Projected 21st Century Climate Change Scenarios and the Potential Impact on an Arctic Barrier Island - Lagoon System: A Pilot Study for Arey Island and Lagoon, Eastern Arctic Alaska	LiDAR DSM, historical maps and imagery,		
2011-06 Ecological Mapping of Northern Alaska and Field Site Photography	Aerial and ground (field site) photography, NASA's GeoCover Landsat orthorectified image mosaics, GINA's SPOT orthorectified image tiles, and many maps derived from remote sensing data.	Helps forms the foundation for revised permafrost maps.	
2011-10 Anaktuvuk River Fire Monitoring	Helicopter-based ocular estimates of burn severity, optical and multi-spectral imagery.		
2011-15 North Slope Landcover Mapping	Landsat TM (as per the proposal)		
2011-18 Integrating Studies of Glacier Dynamics and Estuarine Chemistry in the Context of Landscape Change in the Arctic Refuge		Produced aerial photography and LiDAR for Hulahula and Jago rivers and limited coastal photography.	

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2012-01 and others, ShoreZone	Used some existing photography, video, and ground data from USGS and BOEM.	Georeferenced oblique photos and video of intertidal zone for most of Northern and Northwestern Alaska from Wales to Canada. Intertidal resource habitat classification is underway.	
2012-05 North Slope, Alaska Admiralty Bay LiDAR		Acquiring and processing LiDAR data for Admiralty Bay, Smith Bay, Kogru River and Fish/Judy Creek delta.	
2012-08 Response of an Arctic Freshwater Ecosystem to Climate and Land-Use Change (Fish Creek)			Need time series remote sensing data for habitat classification and chlorophyll a
2012-10 Permafrost Database Development, Characterization, and Mapping for Northern Alaska	SPOT data used to revise water body boundaries and other features contained in old small scale permafrost map.		
2012-11 Historical Orthomosaic, Digital Surface Model, and Shoreline Position for the Northern Alaska Coastline		Producing high-quality historical orthomosaics of Arctic Alaska coast using Alaska High-Altitude Aerial Photography. AHAP photos obtained from 1978-1986 will be orthorectified and mosaicked.	

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2013-01 Terrestrial Environmental Observing Network			High-resolution optical and multi-spectral imagery (historical and contemporary); high-resolution DSM (derived from imagery or LiDAR); SAR data for surface water, soil moisture

High Priority Remote Sensing Needs for Alaska's Arctic

Wildreach (http://arcticlcc.org/assets/resources/WildREACH_Workshop_Report_Final.pdf):

1. Data for creation of high resolution digital elevation models
2. Time series remotely sensed data to identify degree to which coastal processes and sea ice dynamics are reshaping the coastline, and barrier islands.
3. Time series remotely sensed data to determine how hydrological and thermokarst processes are restructuring the land and landcover types. Time series data to document changes in seasonality (snow melt, ice-out, green-up, and senescence).
4. Time series data detecting changes in cloudiness, fogginess.

Arctic LCC Species and Habitat Technical Working Group Report:

http://arcticlcc.org/assets/resources/ArcticLCC_Species_and_Habitat_WG_Report_2012.pdf :

1. Imagery that documents effects of coastal processes such as erosion, deposition, inundation, sea ice patterns, sediment and freshwater input to estuaries.
2. Imagery that documents seasonal effects such as timing of lake and river freeze-up and break-up, snow-on and snow-off, green up and peak greenness.
3. Imagery addressing thermokarst events, thawing effects/subsidence rates, changes in : hydrology, surface water storage, cover type, landforms, habitat.
4. Data that addresses access to subsistence resources.

From the Arctic LCC Science Plan:

http://arcticlcc.org/assets/about/scienceplan/ALCC_Strategic_Science_Plan_draft_Feb2013.pdf :

1. Time series imagery for change detection, including changes in seasonality (snow melt, ice-out, green-up, and senescence).
2. Baseline maps for vegetation, permafrost/ground ice, and to assess human impact.
3. Remote sensing imagery for identifying topography (digital elevation models).
4. Data to assess/monitor key coastal processes: erosion rates, inundation, sedimentation, along with monitoring of sea ice and related conditions.
5. Imagery to produce thematic maps needed by managers.

From Arctic LCC Terrestrial Environmental Observing Network Plan: (<http://arcticlcc.org/projects/teon>):

1. LiDAR , SAR and multi or hyper-spectral imagery of target watersheds (and areas into which we wish to extrapolate) to obtain high-resolution digital elevation models.
2. Time series imagery for documenting snow characteristics over time (length and timing of core snow season, estimated snow-water equivalent), soil moisture, surface temperature, ice characteristics (freeze-up and ice out on lakes and rivers) and vegetation indices (NDVI variation through growing season, NDVI variation between years, variations in plant communities, post-fire succession, etc.).