



Product series: Vegetation Mapping



Overview

The Great Lakes Network (GLKN) encompasses nine national parks: Apostle Islands National Lakeshore (APIS), Grand Portage National Monument (GRPO), Indiana Dunes National Lakeshore (INDU), Isle Royale National Park (ISRO), Mississippi National River and Recreation Area (MISS), Pictured Rocks National Lakeshore (PIRO), Sleeping Bear Dunes National Lakeshore (SLBE), St. Croix National Scenic Riverway (SACN), and Voyageurs National Park (VOYA).

The Network has a strong interest in vegetation inventories for the nine parks, as these baseline products provide crucial information for the design and implementation of the monitoring program. Prior to Network establishment, National Vegetation Classification System (NVCS) vegetation maps had been completed for ISRO and VOYA. The Network developed an approach to mapping the remaining parks as a group, recognizing there would be inherent efficiencies in classification and mapping at parks with similar vegetation, soils, and climate that would result in time and cost savings.

The Network submitted a proposal to the National Vegetation Mapping Program which included a timeline and budget for completion of six parks (Table 1). This project is being carried out in cooperation with NatureServe, who is doing the classification work, and the U.S. Geological Survey –Upper Midwest Environmental Science Center (UMESC), who completes the mapping and creates the final products. MISS was chosen to have a Minnesota Land Cover Classification System (MLCCS) classification performed because MLCCS does a more-detailed analysis of urban and impervious surfaces, which dominate the MISS landscape. The Network has funded an update to the original MLCCS vegetation map from 1999. An accuracy assessment is near completion, and final products should be available soon.

The National Vegetation Mapping Program funded the acquisition of aerial photography to provide a base layer for mapping. These are 12,000 scale, color infra-red air photos, taken in the fall during peak leaf-color change. This film type and phenology is optimal for identifying different tree species. Additionally, the GLKN funded the acquisition of 1:12,000 scale, true color aerial photos, taken in the spring during leaf-off. This imagery allows photo interpreters to clearly separate conifer from deciduous, to see below the canopy and determine understory tree species, and to readily identify wetlands, lakes, and streams. These paired flights are ideal resources for creating accurate vegetation maps, as well as providing high resolution imagery for other Network and park needs.

The air photo products consist of hard copy prints, diapositives (a color transparency), scans of the original film, and ortho-photography. An orthophoto preserves the image properties of the photo, and provides the geometric properties of a map. All products are provided to the park as they are completed and quality-checked. See Table 2 for the current status of projects. The digital data have been distributed on external hard drives, and the Network maintains archived copies. Please contact Ulf Gafvert, Network GIS Specialist, for access to these data sets. Completed vegetation mapping products will be available from <http://biology.usgs.gov/npsveg/>.

Table 1. Timeline and Budget for NVCS mapping projects.

	FY05		FY06		FY07		FY08		FY09		FY10		FY11		TOTAL
	Fall-Winter	Spring-Summer	Fall-Winter	Spring-Summer	Fall-Winter	Spring-Summer	Fall-Winter	Spring-Summer	Fall-Winter	Spring-Summer	Fall-Winter	Spring-Summer	Fall-Winter	Spring-Summer	
Apostles Islands NL, WI (71k ac.)	Scope & Prep	Classif & Dvlp	Classif & Dvlp	Classif & Mapping	Classif & Mapping	Mapping	Mapping	Field Accuracy	Field Accuracy		End Product Production	Wrap-up			
NatureServe	\$30,000	\$74,000	\$6,000	\$10,000	\$5,000	\$5,000	\$5,000	\$50,000	\$4,000	\$6,600					\$195,600
UMESC	\$20,000	\$40,000	\$20,000	\$45,000	\$40,000	\$27,600	\$23,000	\$7,000	\$7,000	\$21,100					\$250,700
Total															\$446,300
Indiana Dunes NL, IN (30k ac.)	Scope & Prep	Classif & Dvlp	Classif & Dvlp	Mapping	Mapping	Field Accuracy	Field Accuracy	Wrap-up		OakWoodland Type Revision					
NatureServe	\$30,000	\$48,000	\$8,000	\$16,000		\$12,000	\$8,000			\$8,000					\$130,000
UMESC	\$20,000	\$40,000	\$20,000	\$70,000	\$18,000	\$5,500	\$5,500	\$15,000		\$14,400					\$208,400
Total															\$338,400
Grand Portage NM, MN (4k ac.)				Planning	Scope & Prep	Classif & Dvlp	Classif & Dvlp	Mapping	Mapping	Field Accuracy	End Product Production	Wrap-up			
NatureServe				\$5,000	\$5,000	\$12,500		\$3,000	\$3,000	\$14,000	\$6,000				\$48,500
UMESC					\$3,400	\$7,000	\$7,000	\$10,200	\$10,200	\$5,100	\$13,100				\$56,000
Total															\$104,500
Saint Croix NSR, WI (181k ac.)			Scope & Prep	Classif & Dvlp	Classif & Dvlp	Mapping	Mapping	Mapping	Mapping	Field Accuracy	Field Accuracy	Field Accuracy	Field Accuracy	Wrap-up	
NatureServe			\$30,000	\$130,000	\$22,000	\$5,000	\$5,000	\$5,000	\$3,000	\$96,000	\$7,000	\$5,000			\$308,000
UMESC			\$20,000	\$35,000	\$45,000	\$120,000	\$104,000	\$105,000	\$105,000	\$22,100	\$22,100	\$37,000			\$615,200
Total															\$923,200
Pictured Rocks NL, MI (84k ac.)	Scope & Prep	Classif & Dvlp	Classif & Dvlp	Mapping	Mapping	Field Accuracy	Field Accuracy				End Product Production	Wrap-up			
NatureServe	\$30,000	\$71,800	\$5,300	\$5,000	\$5,000	\$65,000	\$4,900	\$1,600							\$188,600
UMESC	\$20,000	\$35,000	\$35,000	\$100,000	\$81,000	\$10,000	\$10,000	\$25,100							\$316,100
Total															\$504,700
Sleeping Bear Dunes NL, MI (95k ac.)				Planning	Scope & Prep	Classif & Dvlp	Classif & Dvlp	Mapping	Mapping	Field Accuracy	Field Accuracy		End Product Production	Wrap-up	
NatureServe				\$5,180	\$24,820	\$66,000	\$10,300		\$5,000	\$88,500	\$9,000	\$5,000			\$213,800
UMESC					\$20,000	\$40,000	\$31,000	\$90,000	\$98,000	\$15,100	\$18,100	\$28,500			\$340,700
Total															\$554,500
NatureServe	\$60,000	\$122,000	\$74,000	\$237,980	\$62,120	\$105,500	\$33,300	\$123,000	\$19,900	\$214,700	\$22,000	\$10,000			\$1,084,500
Total	\$182,000		\$311,980		\$167,620		\$156,300		\$234,600		\$32,000				
UMESC	\$40,000	\$80,000	\$80,000	\$185,000	\$161,400	\$300,100	\$251,500	\$237,200	\$230,200	\$102,900	\$53,300	\$65,500			\$1,787,100
Total	\$120,000		\$265,000		\$461,500		\$488,700		\$333,100		\$118,800				
Total costs	\$100,000	\$202,000	\$154,000	\$422,980	\$223,520	\$405,600	\$284,800	\$360,200	\$250,100	\$317,600	\$75,300	\$75,500			\$2,871,600
-462k Total Ac.	\$302,000		\$576,980		\$629,120		\$645,000		\$567,700		\$150,800				

Table 2. Aerial photography acquired for the seven parks. GSD = ..., CIR =

Park	True Color				CIR Flight -			
	Flight - Date	PhotoScale	GSD	Cost	Date	PhotoScale	GSD	Cost
APIS	20050421	24,000	0.3m	\$12,781	20041009	12,000	0.2m	\$41,562
GRPO	20030502	8,000	0.15m	\$16,000	20061004	12,000	0.15m	\$13,474
INDU	20050402	12,000	0.2m	\$15,112	20041021	12,000 & 6,000	0.5m	\$24,085
PIRO	20040511	12,000		\$26,659	20051009	12,000	0.5m	\$29,196
SACN	20050414 & 20060418	12,000	0.18m	\$61,879	20051010	12,000	0.18m	\$55,456
SLBE	20070422	12,000	0.15m	\$40,700	20071018	12,000	0.15m	\$29,020
VOYA	20080523	12,000	0.15m	\$52,943				