



# Monitoring Landscape Dynamics

## Background and Audience

NPScape is a landscape dynamics monitoring project that produces and delivers to parks a suite of landscape-scale GIS data, maps, reports, and other products to inform resource management, planning, and interpretation at local, regional, and national scales. The target audience for NPScape spans the range from GIS specialists who will benefit from the geospatial data and tools, to network ecologists or park resource management specialists who will be interested in general landscape metrics presented in a local and regional context, to park superintendents who can incorporate the maps and graphics into reports or briefings.

## Measures

At its core, NPScape delivers a suite of products that focus on a set of information-rich, landscape-scale indicators for 290+ parks with significant natural resources. Analyses include measures in seven major categories (population, housing, roads, land cover, landscape pattern, climate, and conservation status) that broadly address the environmental drivers, natural attributes, and conservation context of NPS units. In aggregate, these measures contribute to assessments of current natural resource status, potential threats, and conservation vulnerability and opportunity.

## Products

NPScape products represent the culmination of a significant amount of data mining, processing, and analysis. Products delivered for each park and surrounding landscape include:

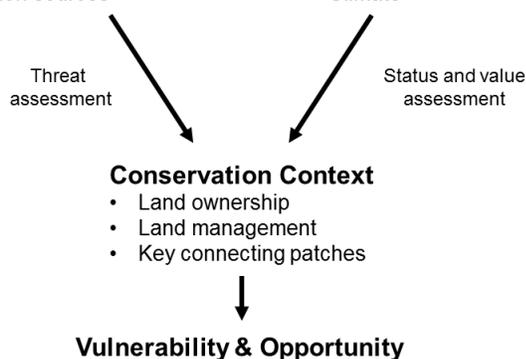
- Source and processed GIS data and associated metadata (see summary table on next page): [http://science.nature.nps.gov/im/monitor/npscape/gis\\_data.cfm](http://science.nature.nps.gov/im/monitor/npscape/gis_data.cfm)

### Human Footprint / Drivers

- Human population
- Roads / rails / power lines
- Impervious surface
- Hydrological impoundments
- Pollution sources

### Natural Systems

- Area of habitats
- Core area
- Connectivity / fragmentation
- Disturbances
- Climate



The area surrounding Saguaro National Park is experiencing rapid urban and suburban development. Changes in the amount and configuration of different land cover types, changes in housing and road density, and other landscape-scale indicators can provide managers with a better understanding of park resources within the context of the surrounding landscape.

- An interpretive guide describing the ecological relevance of NPScape data and measures as they relate to our understanding of current and anticipated landscape dynamics: <http://science.nature.nps.gov/im/monitor/npscape/interpguide.cfm>
- A variety of case studies illustrating common uses of NPScape at park, regional, and national scales: <http://science.nature.nps.gov/im/monitor/npscape/casestudies.cfm>
- A dynamic, user-friendly, interactive map that allows non-GIS specialists to explore NPScape GIS data: <http://science.nature.nps.gov/im/monitor/npscape/viewer/>
- Map services enabling others to view NPScape GIS data and produce custom maps in a variety of programs, including ArcGIS and Google Earth: <http://irmaservices.nps.gov/ArcGIS/rest/services/NPScape>
- A Standard Operating Procedure (SOP) for each measure consistent with I&M protocols, as well as data processing scripts and tools for parks and networks to efficiently generate new customized products: [http://science.nature.nps.gov/im/monitor/npscape/methods\\_sops.cfm](http://science.nature.nps.gov/im/monitor/npscape/methods_sops.cfm)

## More Information

Bill Monahan, Ph.D.  
Ecologist

Phone/E-mail  
(970) 267-2196  
[Bill\\_Monahan@nps.gov](mailto:Bill_Monahan@nps.gov)

Natural Resource Stewardship and Science  
Inventory and Monitoring Division  
1201 Oakridge Drive, Suite 150  
Fort Collins, CO 80525

<http://science.nature.nps.gov/im/monitor/npscape/>

NPScape measures and key data attributes (years of coverage, spatial resolution and coverage).

Measure	Metric	Years	Resolution	Geographic coverage					
				Alaska	Lower 48	Pacific	Caribbean	Mexico	Canada
Population	Current: total and density	1990, 2000, 2010	Census block groups	X	X	X	X		
	Historic: total and density	1790-1990, by decade	County		X				
	Projected: total and density	2010-2030, by decade	County	X	X				
Housing	Housing density	1970-2100, by decade	100 m cells		X				
Roads	Road density	Varies, up to 2005	Varies	X	X	X	X		X
	Distance from roads	Varies, up to 2005	Varies	X	X	X	X		X
	Area without roads	Varies, up to 2005	Varies	X	X	X	X		
Land cover	Natural vs. converted	1992 and 2001, or 2005	30 or 250 m cells	X	X	X		X	X
	Anderson Level I & II	1992 and 2001; 2005; 1996, 2001, 2005-2006	30 or 250 m cells	X	X	X		X	X
	Impervious surface	2001	30 m cells		X	X			
Pattern	Patch size	2001 or 2005	30 or 250 m cells	X	X			X	X
	Morphology	2001 or 2005	30 or 250 m cells	X	X			X	X
	Area density	2001 or 2005	30 or 250 m cells	X	X			X	X
Climate	Mean	Varies, 1895-present (day, month)	Varies, ~770 m to 17 km cells	X	X	X	X	X	X
	Water year mean	Varies, 1895-present (day, month)	Varies, ~770 m to 17 km cells	X	X	X	X	X	X
	Percentile	Varies, 1895-present (day, month)	Varies, ~770 m to 17 km cells	X	X	X	X	X	X
	Zonal statistics	Varies, 1895-present (day, month)	Varies, ~770 m to 17 km cells	X	X	X	X	X	X
Conservation status	Area protected	Varies	Varies	X	X	X	X	X	X
	Ownership	Varies	Varies	X	X	X	X	X	X