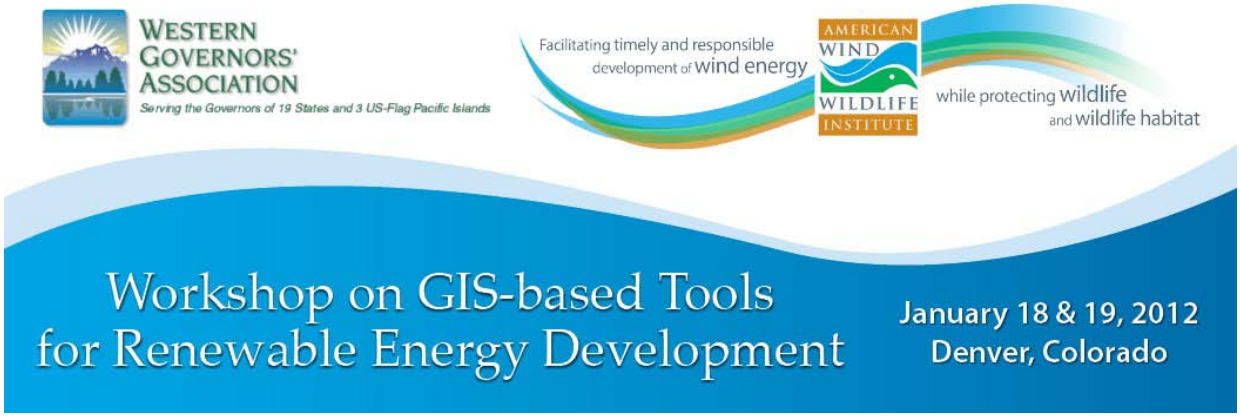

WORKSHOP REPORT

March 2012

On January 18 and 19, 2012, The Western Governors' Association and the American Wind Wildlife Institute hosted a workshop on GIS-based Tools for Renewable Energy Development. Representatives from the state and federal government, industry, and nongovernmental organizations who use GIS in their everyday work and decision making participated in a lively discussion. The workshop focused on the use of GIS-based tools to inform the intersection of renewable energy development and conservation of wildlife habitat, but the discussion included a much broader look at the current needs – and future potential – for GIS-based information to inform land use planning.

Workshop participants are listed in Appendix A.

The products from this workshop are:

1. a compilation of "lessons learned" about the development of GIS-based tools and their use in the renewable energy arena; and
2. a catalog of existing GIS tools (Appendix B).

AWWI and WGA staff synthesized the following "lessons learned" from discussions during the workshop:

Lessons Learned – GIS Tool Development and Utility

A. GIS-based tools should provide general, lay user, accessible information to broadly inform decision making in the early stages of project planning

B. GIS tool developers need to recognize the challenge in addressing the different levels of spatial literacy in users. Users have a range of technical capabilities so tools should support a wide variety of skill levels.

C. Tools should be interactive and accessible. Users want the ability to upload and download data, create reports in the system, and easily manipulate data.

D. Some users would prefer to input their own data into GIS tools, a feature which could enhance and customize the decision-making process.

E. GIS tool creators should be clear about the data origin and age of the data. The tool should link to an explanation of the tool features – review of the data layers, what are the appropriate use of the data layers, what scale is used, metadata, the range of certainty, the methodology of collecting data, and any other relevant information.

F. Similarly, developers should create products that tell people how to use the information. Tools should provide analysis or relevancy of included data, not just raw data (i.e. risk and uncertainty, prioritization, user recommendations).

G. GIS tool creators and users need to find solutions to *confidentially* exchange of private and public sector data. GIS users should be able to utilize tools – including those provided by the state or federal government –without privacy concerns about their data.

H. When successfully developing a tool, designers should define the need or question that the tool is intended to address. Developers should also be able to clearly state what the "measure of success" is for the tool's use – a list of objectives that can be defined and measured as desirable outcomes from the tool's release.

I. To reduce confusion among the many tools available, and to clearly communicate the value of these products, tool developers should clearly define the terms they use such as "tool," "system," and "data."

J. GIS tool providers should define and track "sustained use." Additionally, tool providers should be open to the possibility of changing the design of the system over time in order to sustain use. Providers should also be able to recognize when their tools are no longer needed.

K. Since GIS technology is constantly evolving (currently towards near-ubiquitous use of "the cloud"), GIS developers, users, and facilitators should likewise constantly evolve their thinking. GIS tool providers should regularly consider how to better meet user needs and provide opportunities for collaboration. Users should think about ways to provide feedback to developers and how to share the information they find through use of the tools (if appropriate).

Future Possible Tasks for AWWI and/or WGA

During the discussion, participants offered the following suggestions for future tasks:

A. AWWI and/or WGA could help GIS tool users wade through the many existing public tools by organizing available resources in a format that indicates the intended purpose of each tool and the appropriate phase of planning that tool can inform.

    i. For example, NatureServe maintains a database of coastal and marine GIS tools in its online Ecosystem-Based Management Tool.

    ii. Additionally, a "taxonomy of tools" could illustrate connections between tools as opposed to assuming competition.

Appendix A: Meeting Participants

First Name	Last Name	Organization
Taber	Allison	American Wind Wildlife Institute
Betsy	Arlen	BP Wind Energy
Abby	Arnold	American Wind Wildlife Institute
Steve	Barton	Wildlife and Sport Fish Restoration Program, USFWS
Jon	Belak	Defenders of Wildlife
Steve	Benson	Minnesota Department of Natural Resources
Carlee	Brown	Western Governors' Association
Matt	Bullock	Arizona Game and Fish Department
Tasha	Carr	US Geological Survey
Bill	Daigle	Montana Fish, Wildlife & Parks
Jay	Diffendorfer	Rocky Mountain Geographic Science Center, USGS
Joe	Fargione	The Nature Conservancy
Sean	Finn	Great Northern Landscape Conservation Cooperative, USFWS
Mary	Flanderka	Wyoming Game and Fish
Chris	Friel	Esri
Lindsey	Guinther	enXco
Patti	Haggerty	Forest & Rangeland Ecosystem Science Center, USGS
Jeff	Hamerlinck	Wyoming Geographic Information Science Center, U of Wyoming
Chris	Hise	The Nature Conservancy
Dan	Hogan	Wildlife and Sport Fish Restoration Program, USFWS
Mike	Houts	Kansas Biological Survey
Todd	Lickfett	US Fish and Wildlife Service
Tom	Lupo	California Department of Fish & Game
Dan	Moreno	ICF International
Tom	Murray	Esri
Vito	Nuccio	US Geological Survey
Marco	Palmeri	Electric Power Research Institute
Evan	Paul	McClintock Lab, Center for Marine Assessment and Planning, UCSB
Jay	Pruett	The Nature Conservancy
Jorgina	Ross	Kansas Biological Survey, Kansas Applied Remote Sensing Program, University of Kansas
Leslie (Jingle)	Ruppert	US Geological Survey
Lori	Scott	NatureServe
Jodie	Snyder	ICF International
Jim	Strittholt	Conservation Biology Institute
Katie	Umekubo	Natural Resources Defense Council
Stu	Webster	Iberdrola Renewables
Madeleine	West	Western Governors' Association

Appendix B: Summary of GIS-based Tools

Tool	Developer	Audience	Purpose	Website
Arizona HabiMap	Arizona Game and Fish Department	those interested in Arizona's wildlife	To explore wildlife distribution throughout the state and maximize the return on conservation efforts	habimap.org
AWWI Landscape Assessment Tool	The Nature Conservancy, with input from industry and environmental partners	wind energy developers, environmentalists, state and federal F&G specialists and others.	To provide early guidance about possible site sensitivity	wind.tnc.org/awwi
California Areas of Conservation Emphasis (ACE)	California Department of Fish and Game	Anyone interested in conservation priorities in California, but primarily the professional community	To compile and analyze spatial information on species, habitats, and recreational needs and opportunities, and integrate these data into a model to identify areas of conservation priority. Useful for early project scoping.	www.dfg.ca.gov/biogeodata/ace
California Biogeographic Information and Observation System (BIOS)	California Department of Fish and Game	Anyone interested in species observation and distribution data, but primarily the professional community.	States central repository for biological observation and distribution info. Contains over 600 individual databases including the CA Natural Heritage Program data. Provides tools for querying and reporting. Useful for site specific project work.	www.dfg.ca.gov/biogeodata/bios
California Wind Decision-Support Model	Conservation Biology Institute		To support decisions for minimizing ecological impacts in the southern Sierra and Tehachapis	www.consbio.org/products/projects/18

Kansas Natural Resource Planner	Kansas Biological Survey	wind developers, consultants, Kansas Dept. of Wildlife, Parks, and Tourism	To provide a central, accessible repository for natural resources data currently available in Kansas	kars.ku.edu/maps/naturalresourceplanner
LandScope America	Nature Serve, National Geographic	land trusts, conservation groups and foundations, state and local governments, federal policy makers	To increase the pace and effectiveness of U.S. land protection investments and inspire and inform place-based, collaborative conservation	www.landscope.org
LEAP (Landscape-scale Energy Action Plan)	U.S. Fish & Wildlife Service, Region 6	biologists, managers, project proponents	To support landscape-scale decision making and proactive conservation planning for energy development	my.usgs.gov/catalog/LEAP
Marine Map & SeaSketch	University of California Santa Barbara	all interested stakeholders	To facilitate web-based collaborative geodesign	marinemap.org
Montana Crucial Areas Planning System (CAPS)	Montana Fish, Wildlife & Parks	biologists, planners, developers	To identify the value of aquatic and terrestrial resources at an appropriate scale; provide an avenue for the public to gain information early and easier; increase efficiency and transparency	fwp.mt.gov/fishAndWildlife/conservationInAction/crucialAreas.html
NatureServe Vista	Nature Serve	Planners, resource managers, scientists, and conservationists	To conduct conservation planning and assessments; integrate conservation values with other planning and assessment activities; evaluate, create, implement, and monitor land use and resource management scenarios	www.natureserve.org/prodServices/vista/overview.jsp
Regional Transmission Expansion Planning Process	ICF International	Western Electricity Coordinating Council Environmental Data Task Force	to support the interconnection-wide electric transmission planning studies in the Western Interconnection	www.wecc.biz/Planning/TransmissionExpansion/RTEP/Pages/default.aspx

Renewable Energy And Defense Geospatial Database (READ-Database)	NRDC (in partnership with the Department of Defense)	developers, agencies, and other interested stakeholders	To help renewable energy developers identify appropriate sites for renewable projects such as utility-scale wind, solar, and geothermal energy facilities, that are unlikely to interfere with military activities and training, and have the fewest environmental conflicts.	www.nrdc.org/energy/readgdb.asp
Southern Great Plains Crucial Habitat Assessment Tool (SGP CHAT)	Kansas Biological Survey	those conducting landscape and habitat assessment	To assess lesser prairie-chicken habitat suitability across five states	kars.ku.edu/maps/sgpchat/
Western Regional Partnership Web Mapping Application	DoD Western Regional Partnership / ManTech Intl. Corporation	federal departments and agencies and state and tribal executive leadership in western states	To assist planning efforts among the regional senior policy level partnership	www.wrpinfo.org
Wyoming Interagency Spatial Database & Online Management System (WISDOM)	Wyoming Geographic Information Science Center, Univ of Wyoming	developers and agencies	To provide data and knowledge to address environmental concerns, consider alternatives , and make informal development decisions	wisdom.wygisc.org

Additional Tools:
Oklahoma Lesser Prairie Chicken Spatial Planning Tool: www.wildlifedepartment.com/lepcdevelopmentplanning.htm
Great Lakes Wind Atlas erie.glin.net/wind/
Oklahoma Wind Power Initiative: www.ocgi.okstate.edu/OWPI/