INTRODUCTION

VISUAL RESOURCE STEWARDSHIP: LANDSCAPE AND SEASCAPE MANAGEMENT IN A TIME OF CHANGE

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Abstract.—This introductory paper to the Visual Resource Stewardship Conference Proceedings describes efforts to develop and maintain professional capacity in the field of visual resource management (VRM). Large-scale energy development over the last two decades has been a major factor in the resurgence of activity in VRM, particularly with respect to visual impact assessment and mitigation. Efforts to capitalize on this activity culminated in a 2017 conference, and 27 papers and seven visual case studies from it are included in this proceedings, covering five broad themes: Federal agency programs and policies; theory and concepts; visual quality assessment; visual impact assessment and mitigation; and VRM tools and technology. The conference was also used as a springboard to launch additional activities aimed at building professional capacity for VRM, which are in progress and are described at the end of the paper.

STEWARDSHIP OF A FIELD

Although change has long been a defining characteristic of the American landscape, the rate, scale, and extent of change during the first two decades of this century have posed formidable new challenges to the protection of our visual resources. The most significant driver of this recent change has been energy, with increased demand, price, and access through fracking, and changes to national policies to seek energy independence that resulted in a surge of oil and gas development in the early 2000s (Pasqualetti and Stremke 2018). The Energy Policy Act of 2005 incentivized a national renewable energy development portfolio that called for approving projects to generate at least 10,000 megawatts of nonhydropower renewable energy on Federal lands by 2015 (Smardon et al. 2017). State and private lands form an essential part of the total energy equation, both directly as sites for development or indirectly for transmission corridors and materials supply (e.g., Walsh 2015). Together with new initiatives for offshore energy development and important urban, cultural, and scenic areas that lie within the viewsheds of project activity, few places in the landscape are not in some ways affected by our energy appetite.

As stewards of the visual resource (Chenoweth 1986), landscape architects and other environmental professionals in the public and private sectors have responded to these challenges with renewed enthusiasm and involvement in the field of visual resource management or VRM. VRM is concerned with the development and application of methods and tools to protect scenic beauty and minimize the scenic impacts of development activities. It emerged as a defined field of practice and research in the 1960s and grew rapidly in the United States in response to legal and policy initiatives such as the National Environmental Policy Act (NEPA) and the National Forest Management Act (Fabos 1974, Zube et al. 1982). Advancements in VRM research and practice slowed in the late 1980s and '90s as research priorities shifted elsewhere (Smardon 2016). At the Federal level where much of the early innovation had occurred, adoption of improved methods such as the USDA Forest Service's Scenery Management System (USDA

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Forest Service 1995) was hampered by a decreased in-house capacity and lack of incentive to revise previously developed VRM plans. Together with a growing move toward the integration of scenery issues with broader concerns of ecosystem management, ecosystem services, and other methods, some in the field began to question whether VRM could or needed to be sustained as a distinct field (Daniel 2001, Ribe et al. 2002). But today, in light of the new "energy landscapes" (Pasqualetti and Stremke 2018) and the unique problems they bring for managing the visual resource, any pronouncements about the demise of the field would seem to be premature.

The events leading to the publication of this proceedings are testament to the renewed interest in VRM and commitment to stewardship of its growth and vitality. Spurred by escalated energy development on Federal public lands, the Bureau of Land Management (BLM) experienced a soaring interest by professional NEPA practitioners in its visual resource management training course. Typically offered to Federal practitioners once a year, in 2007 the course was opened to private sector contractors to expand the professional knowledge base and in 2009 was increased to twice a year.

In 2010, Louise Kling, then an environmental planner at URS Corporation and one of the BLM course graduates, organized a support group of visual resource practitioners in the Portland, OR, area to develop more defensible visual impact assessments for BLM-contracted work. The small group of private practitioners and agency visual resource management specialists quickly grew to an informal nationwide network with a broadened range of participants. In 2011, Kling collaborated with Brad Cownover (Pacific Northwest Regional landscape architect for the USDA Forest Service and former Director of Scenic Conservation for Scenic America) to preserve the momentum by seeking opportunities to create a national conference on the topic. This led Kling, Cownover, and several of the authors of this paper to develop a VRM short course as part of the 2012 National Association of Environmental Professionals (NAEP) annual meeting in Portland, OR. The 1-day course was well attended by a diverse range of participants, and in the conference itself, papers focusing on VRM issues accounted for nearly a third of the program.

The network Kling began had now coalesced with a strengthened ambition that continued for several years at the annual NAEP meetings. Yet to sustain VRM as a field, additional steps were needed to establish its identity, build a critical mass of participants, and distinguish it from the broader group of environmental professionals. While some of the steps were a direct outgrowth of the 2012 NAEP conference, others were independent activities that happened to be coincidental to those inspired by the conference.

One such activity was the BLM's Web-based clearinghouse of VRM materials activated in 2016. The BLM's Wyoming State Renewable Energy Coordination Office provided funds to Argonne National Laboratory to build a Website dedicated to visual resource information that specifically targeted wind energy issues. The goal was to better educate the industry about integrating visual resource considerations early into the wind generation project planning process. As other Federal land and offshore management agencies released new initiatives concerning stewardship of visual resources, the focus of the Website shifted from a renewable energy audience to a broader context as a visual resource information clearinghouse. Robert Sullivan of Argonne National Laboratory (Argonne) gathered resources for Federal agency visual resource management and visual impact assessment into one publicly accessible location (http://blmwyomingvisual.anl.gov/). In addition to organizing existing information on agency programs, the site also documents many of Argonne's and others' VRM research and methods development projects conducted for BLM, the National Park Service (NPS), and the Bureau of Ocean Energy Management. These studies focus primarily on renewable energy development, siting, and visual impact mitigation issues.

Other important independent activities were the development of a comprehensive visual impact mitigation guide for renewable energy facilities on BLM lands, the development of guidelines for evaluating visual impact assessments and simulations in environmental impact statements, and the development of a visual resource inventory methodology for NPS; the latter two efforts were joint collaborations between Argonne and staff from NPS's Air Resources Division.

Next was development of a high-profile book aimed at providing a VRM perspective on renewable energy

development, particularly on large-scale on- and offshore wind turbines, solar power plants, geothermal power plants, and connecting transmission lines that were creating major visual impacts and vociferous public response. As a long-time leader in the field, landscape architect Dean Apostol observed that the state-of-the-art on visual resource and impact assessment had seen significant advances since the 1990s and a dedicated book was needed to bring together this knowledge in the context of renewable energy development. Drawing on material from several NAEP conferences, the work at Argonne, and the professional experience of a core team of editors and contributors, "The Renewable Energy Landscape: Preserving Scenic Values in our Sustainable Future" was published in 2017 (Apostol et al. 2017). As a resource for practitioners and a textbook for scholars and students, the book establishes the identity and necessity for VRM in the context of the new energy landscape.

The latest step was development of a nationwide conference with a singular focus on VRM. Sullivan secured the use of Argonne National Laboratory's meeting space and accommodations and beginning in 2016 led a conference planning committee made up of the authors of this paper. The result was the conference *Visual Resource Stewardship: Landscape and Seascape Management in a Time of Change*, held in November 2017. This was the largest U.S. conference focusing on scenic resource issues since the *Our National Landscape* conference in 1979 (Elsner and Smardon 1979) and included more than 80 participants from Federal, State, and local agencies, academia, private sector consulting, and nonprofit organizations from across the United States and Canada.

VRM THEMES

While the energy landscape was a main driver for convening the conference, VRM has always been concerned with more than the visual impacts of energy development. The conference planning committee sent out a call for papers suggesting a broad array of topics, and it asked presenters to submit draft papers or slide presentations prior to the conference to share among participants and kick-start discussion. After the conference, the proceedings editors provided feedback to those wishing to further develop their work for publication. In addition to standard papers, we also gave participants the option of submitting their work in a "Visual Case Study" format that emphasizes the visual communication of material along with interpretive text. The resulting proceedings reflects the range of concerns of the conference participants and the field as a whole, with papers organized along five broad themes (plus the visual case studies).

Federal Agency Programs and Policies

Federal land management agencies continue to play a leadership role in developing and implementing VRM methods, and participants from BLM, NPS, the Forest Service, and the Bureau of Ocean Energy Management provide updates of their work. Along with developing improved ways to deal with energy development, agency contributions described in the proceedings cover many issues. These include developing new inventory methods to assess visually and culturally significant viewsheds on a diverse set of properties; exploring ways to incorporate stakeholder perceptions and preferences into management objectives for maintaining scenic integrity; and how VRM issues can be coordinated across multiple scales and jurisdictions.

Theory and Concepts

VRM is an applied field but methods and tools must be developed in ways that ensure they are grounded in relevant theory and concepts of landscape perception and assessment. Their measures need to be reliable, accurate, and useful in answering management questions (Daniel and Vining 1983). Papers in this section examine how VRM approaches can be made more theoretically robust in accounting for landscape aesthetic qualities and perceptions, how VRM fits within the larger conceptual framework of cultural ecosystem services, the importance of scale perception in visual assessments, and how understanding of historical ideals of landscape design can guide management of visual and cultural resources.

Visual Quality Assessment

VRM approaches for addressing large-scale Federal lands have traditionally focused on protecting naturalistic conditions, but the work featured here shows that the cultural landscape is also an integral part of visual quality assessments in many regional and land use contexts. Papers in this section detail the NPS's new approach to visual resources inventory,

the integration of crowd-sourced photography in understanding visually important dimensions of the rural landscape, and how ideas of visible stewardship can be integrated into community forestry to build a more robust and acceptable program.

Visual Impact Assessment and Mitigation

The energy landscape drives a wide range of work related to visual impact assessment and mitigation. Work represented in the proceedings examines scale, routing, and color contrast treatment in the design and siting of power transmission facilities. Other papers deal with addressing visual impacts in the context of historic sites and the protection of night skies and naturally dark conditions in National Parks.

VRM Tools and Technology

VRM approaches often depend on advances in technology and tool development, and recent advances in visualization, simulation, and other tools and techniques were well represented at the conference. Two papers detail work on modeling coastal changes under climate change scenarios and the use of three-dimensional (3D) modeling in visualization. Another five abstracts describe a variety of other advances presented at the conference.

Visual Case Studies

Because of their format differences, the visual case studies are presented in a stand-alone section of the proceedings, each accessible by its own link. (accessible through https://doi.org/10.2737/NRS-GTR-P-183) Among the work included in this section are case studies on integrating visual resource and visitor use management in planning for a National historic district, development of a baseline visual assessment approach as applied to a long-distance trail corridor, and the role of the public in visual impact assessment.

BUILDING CAPACITY

While this proceedings serves to extend the reach of work presented at the conference, the conference committee had a broader goal to use the occasion as a springboard to further grow the field. In addition to plenary and workshop sessions, we held a number of general sessions devoted to "guided discussions." These sessions provided an opportunity to ask questions about the field of scenic resource stewardship and, with feedback and interaction, gain an understanding of where we were and where we needed to go.

Especially important was the session on *Building Scenic Resource Professional Capacity* led by Sullivan and James Palmer. They polled the attendees prior to the meeting about their needs for a VRM support group. During the guided discussion, the attendees talked about their needs for professional development, group communication, and how the group might move forward. The group voted to move forward on three fronts with a Web-based networking group, a newsletter, and a conference committee. At the time of this writing the networking group has been launched and we invite participants to join.[2] Preliminary plans are underway for the next VRM conference to be held in 2019.

The organizing group also conducted a post-conference poll of participants about what they liked, did not like, and what they would change about the conference. Things most liked were the opportunity to network and the content of the material presented. Things to work on or improve were the lack of international participation; lack of diversity in terms of gender, race, and age; too many topics competing with each other; and how some subject matter was presented.

We are hopeful that the conference and this proceedings, building on the previous visual resource stewardship activity dating back to 2012, are signs of revitalization in the field of VRM, which we collectively hope to move forward. Managing landscapes such that they provide for the needs and wants of society–including energy and scenic beauty–is a goal we share with many land management professionals across the country and world. We also hope the tools and insights provided here will be useful in meeting the challenges that future technological changes will bring while helping to protect and enhance the enduring qualities of our scenic resources.

[2] To request membership, go to: https://groups.google.com/forum/#!overview and in the search box at the top of the page, enter "Visual Resource Stewardship." Click the group's name, which appears at the top of the list, and then click "contact the owner" to send an email with your name and why VRS interests you. For further information, contact Jim Palmer at palmer.jf@gmail.com.

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