

Art, science merge in study of 19th-century landscape paintings' ecological integrity

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Thomas Cole (American, 1801–1848). *The Mountain Ford*, 1846. Oil on canvas, 71.8 × 101.8 cm. Metropolitan Museum of Art, bequest of Maria DeWitt Jessup, from the collection of her husband, Morris K. Jessup (15.30.63). Credit: *Ecosphere* (2023). DOI: 10.1002/ecs2.4649

An Oregon State University-led collaboration of ecologists and art historians has demonstrated that landscape paintings from more than 150 years ago can advance environmental science.

Researchers from Oregon State University, the U.S. Forest Service, the University of Vermont and the Smithsonian American Art Museum used 19th-century depictions of pre-industrial forests in the northeastern United States to show that historical artwork can reveal information about forests and other landscapes from eras that predate modern scientific investigation.

The study, which examines how to address concerns of artistic license affecting paintings' accuracy, was published in [Ecosphere](#). The research sets the stage for future collaborations between scientists and art history experts, the authors say.

"The study of past environments—historical ecology—has particular relevance in providing context for [landscape](#) change in the future," said Dana Warren, associate professor in OSU's College of Forestry and the study's lead author.

"We are entering a future in which we will see increasing ecological change, and understanding the conditions and shifts in historic landscapes—naturally and in response to human-caused impacts—can be important in contextualizing anticipated future changes."

The authors note that much of what is known about the North American forests of two or three centuries ago comes from land surveys conducted as European settlers expanded across the continent.

While useful, those assessments omit many key [forest](#) features, the authors point out, particularly the complex structural attributes of the forest plus features in the understory and surrounding landscape.

Researchers including Isabel Munck of the Forest Service, William Keeton of the University of Vermont and Eleanor Harvey of the Smithsonian focused on artwork produced during a 60-year period beginning in 1830.

"Collaboration led to a lot mutual learning, which helped us to see and understand important information recorded in these paintings," Keeton said.

The study examined artists of the "Hudson River School," particularly Asher Durand. The school, heavily studied by [art historians](#), was a New York-based fraternity of landscape painters concerned with how people were affecting forests, particularly through extractive industries. The artists had ready access to the wilderness north of the city via steamship along the Hudson.



Example of a Forest Interior painting by nineteenth century landscape artist, Asher Brown Durand (American, 1796–1886). Group of Trees, c. 1855–7. Oil on canvas, 61 × 45.7 cm. New-York Historical Society, purchase, the Louis Durr Fund (1887.8). Credit: *Ecosphere* (2023). DOI: 10.1002/ecs2.4649

"The northeastern U.S. in the mid-1800s was an epicenter for an emerging confluence of art and natural history," said Peter Betjemann, executive director of arts and education in the OSU College of Liberal Arts. "Extensive forest clearing was happening, and it was during this period that landscape painting exploded in popularity in North America and became a dominant artistic genre."

[Durand](#) (1796–1886) was a prolific and influential member of the Hudson River School and left clear records about his perspectives regarding the accurate depiction of nature, Betjemann said.

"A review of his images and writings supports the potential use of many of his paintings and sketches in historic forest ecology research," he added.

In making that review, the authors applied four criteria commonly used to evaluate the veracity of any historical record for ecological research purposes:

1. Did the person (in this case Durand) who reported the observations personally make them—i.e., did he visit the scenes he painted?
2. Was he knowledgeable of the subjects he depicted?
3. What was the broader historical and ecological context surrounding his work?
4. Did bias or any special interest influence the work?

"Working with art historians gave us the tools to put paintings and painters in context, which then allowed us to identify the images in which we can place the greatest trust," Warren said. "These paintings—if accurate—provide potentially valuable information about landscapes and forests in the mid-1800s, but up till now, the use of 19th-century landscape art in historical ecology has been hampered by concerns over the degree to which artists applied artistic license."

Appreciating the scientific contribution of these landscape artists brings another dimension to "amazing, detailed paintings" that has been hiding in plain sight, added David Shaw, a forest health specialist at Oregon State.

"The key to utilizing historical landscape paintings involves both objective scientific assessment of what is in the [painting](#) and historical art techniques that confirm whether the artist sought to paint accurate depictions of nature," Shaw said. "That means it's critical that scientists collaborate with art historians, which brings science and art together even though art and science are thought by some to be very different disciplines with nothing in common."

OSU graduate student Harper Loeb also collaborated on the study, which the authors say provides a path forward for future work that blends art history and science.

"Bringing together colleagues from across disciplines deepens our understanding of how historical artworks provided commentary on ecological concerns," Harvey said.

"This project really demonstrated the strength of collaboration across multiple disciplines and institutions," Munck added.

More information: Dana R. Warren et al, An interdisciplinary

framework for evaluating 19th century landscape paintings for ecological research, *Ecosphere* (2023). [DOI: 10.1002/ecs2.4649](https://doi.org/10.1002/ecs2.4649)

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