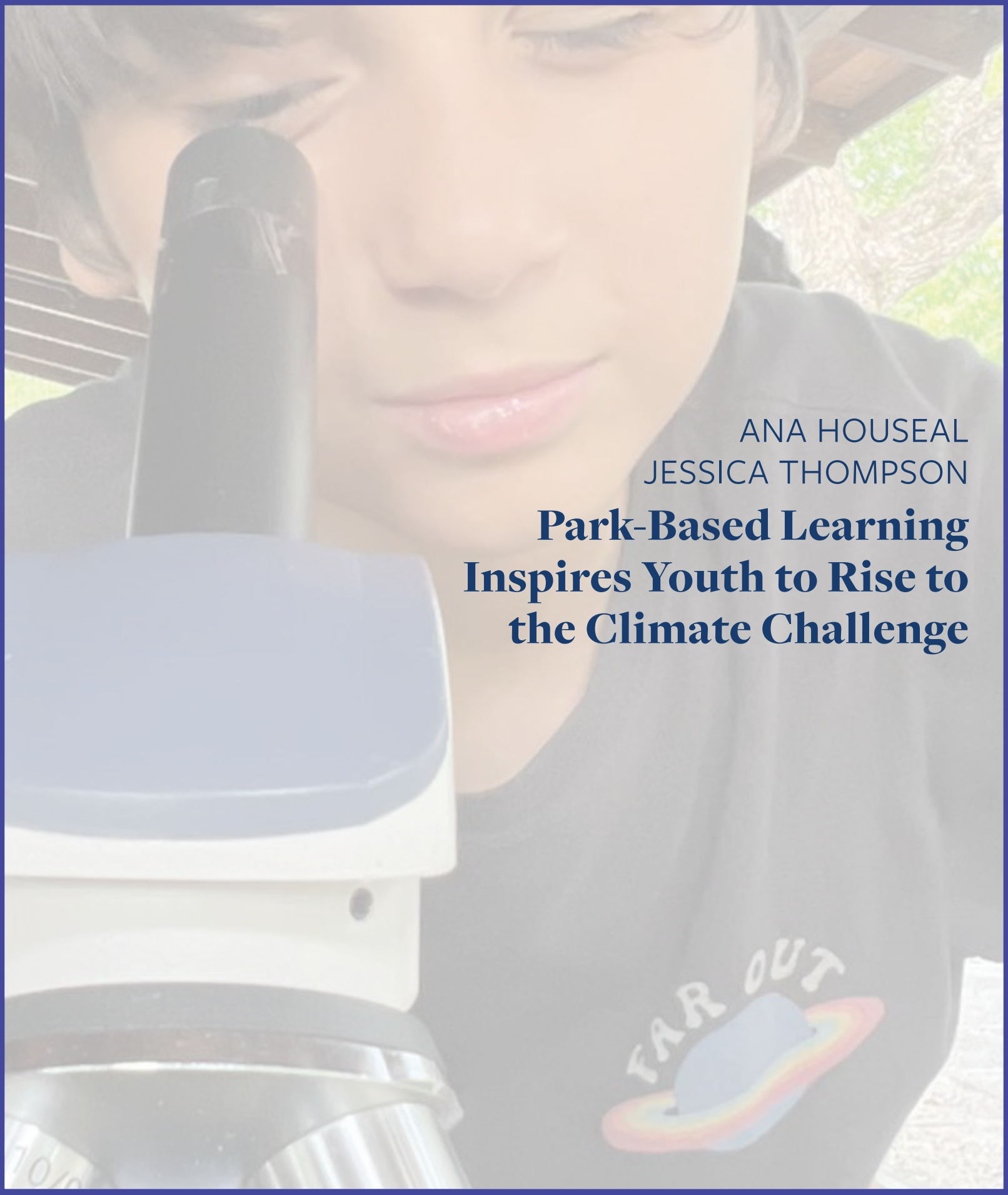

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Park-Based Learning Inspires Youth to Rise to the Climate Challenge

For more than a century, America's parks have been places *for all*. At the federal level, the National Park System protects some of the country's most fragile areas—remote, rural, and urban spaces alike. The national parks are complemented by state, regional, county, and municipal park systems that provide opportunities to be in nature, engage with cultural heritage, and—crucially—learn about both. Together, all these parks provide a canvas to tell our shared stories as a nation—both easy and difficult ones. This is the legacy that public lands provide our nation, generation after generation.

Today, these places also tell the story of a rapidly changing climate. The earth is warming faster than scientists can measure and predict. People are losing their homes to wildfires, communities are flooded, and livelihoods are threatened with each catastrophic storm, which are becoming more and more frequent as our climate system becomes more and more unstable. For decades, America's public lands have been the brave "canaries" giving us bold warnings about the accumulating effect of our changing climate. The observations, evidence, and narratives of climate change abound. There are thousands of studies on hundreds of species at hundreds of sites—there is no shortage of science. Today's challenge is translating and sharing this information with a variety of audiences, including the next generation.

The theme of this special issue of *Parks Stewardship Forum*, "Park-Based Learning: Youth Engagement in Climate Change Education," has evolved over the past several months, but the focus and the goal remain the same: there is tremendous potential to facilitate learning about climate change with and within US national park sites and in other parks across the country. This special issue focuses on partner agencies and organizations that have developed innovative approaches to engaging learners to better understand natural science, climate change, and sustainability ethics. There are hundreds of examples of this work and these types of partnerships across the country, and this special issue packages a unique combination of case studies and activity guides. The case study format may be more familiar, but we're very excited to introduce a set of activity guides that could be adapted and used in classrooms, at camps, or on field trips to virtually any public land or park. Here we provide short descriptions of the articles that follow.

While the National Park Service (NPS) units and other public lands offer us unique opportunities to recognize effects of climates change, Scott Ramsey and Steve Sassaman argue that in order to engage and advocate for solutions, we must first uncover our own relationships with the natural world. Building upon the Biophilia Hypothesis (Wilson 1984; Kellert and Wilson 1993), they created a tool called the Biophilic Profile (https://biophilicprofile.com/) to help people identify their own ways of knowing nature. Next, Sassaman and Ramsey, joined by Deidra Goodwin, take the Biophilic Profile tool further in presenting a set of seven activities that are tightly connected to the profiles. These activities can be used to strengthen group interactions about nature by allowing participants to bond over shared values, thus enabling deeper conversations to engage in climate consciousness and inspire action.

Natalie Bursztyn and Diane Clemens-Knott tackle a critical need for students to make personal connections within what is often the only Earth science course undergraduates take in their college journey. Likewise, Earth science is frequently missing in K–12 education, often only appearing as a requirement in middle school. An undergraduate course called Geology of the National Parks fills quickly with trendy, technology-savvy students who follow NPS social media accounts. Using an instructional strategy that has students apply geology content knowledge and communication skills in an "Education Signs Activity," students translate knowledge about the geology in specific NPS settings (e.g., Bryce Canyon and Glacier National Parks) into a format appropriate for general audiences. After students have developed their interpretation skills, they are empowered to examine satellite imagery to observe the impacts of anthropogenic climate change that have transformed the landscapes of America's national parks over the last 40 years.

Clare I. Gunshenan, Martha C. Inouye, Sarah Collins, Leslie Cook, Megan Kohli, and Julia Olson describe a multi-year, multi-partner, grant-funded project focused on shared learning about water resources affected by climate change in Wyoming. The project includes teachers, science education researchers and

OVERLEAF **Student using a microscope to see plankton during a field trip to Deering Estate.** MIAMI-DADE COUNTY PARKS, RECREATION AND OPEN SPACES DEPARTMENT

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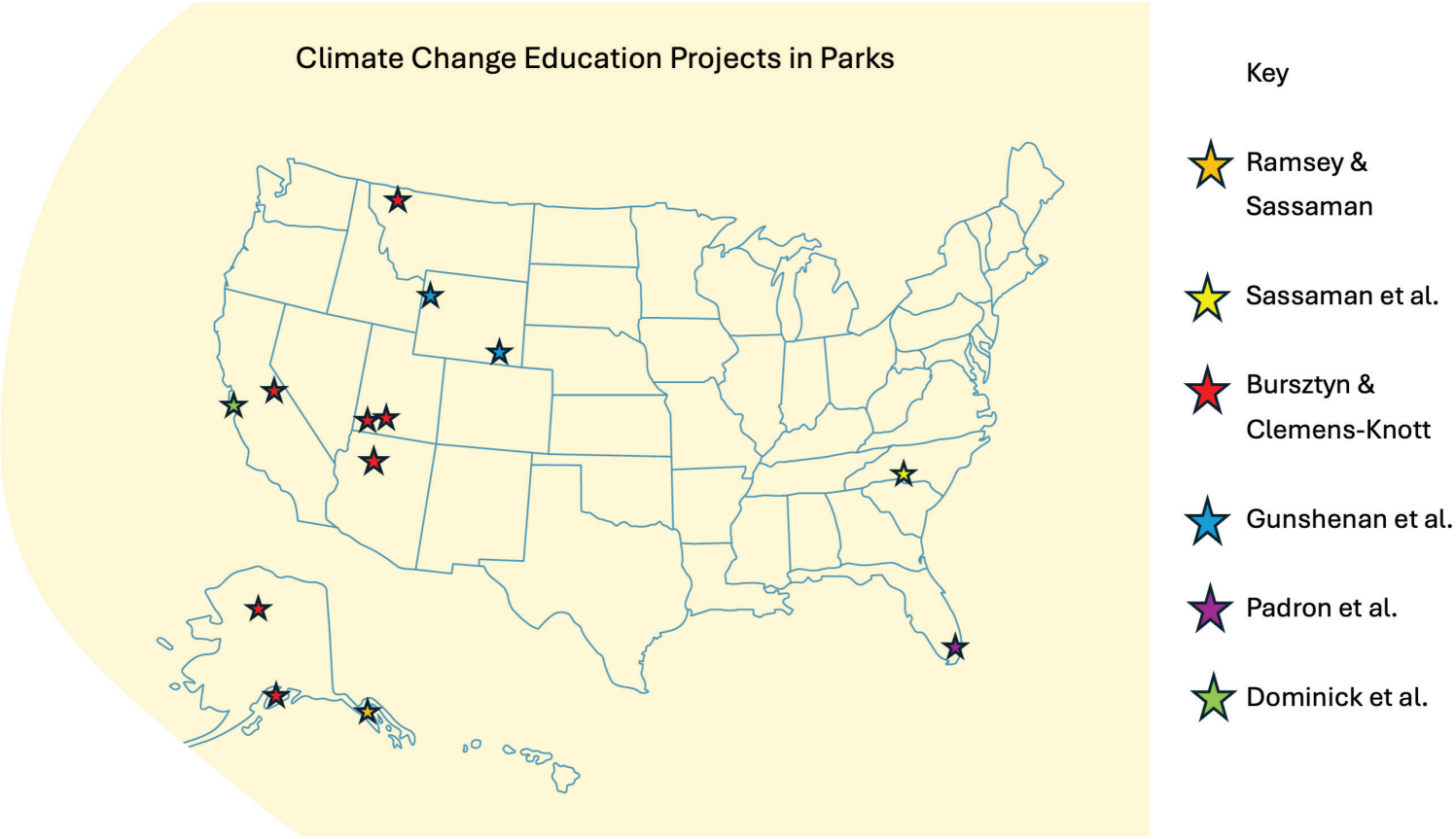

educators, and resource scientists working together at the headwaters of the Snake River in the Greater Yellowstone Ecosystem. With a focus on improving youth science literacy, the project braids the complexity of social, economic, and cultural interests with long-term environmental monitoring efforts. Teachers and science researchers take content and pedagogical methods from their respective fields, creating a multiplier effect.

The last two contributions in this special issue are case studies from literally across the country that illustrate place-based climate change education at multiple scales. The authors engage learners at a variety of public lands (local, state, and federal) and with a variety of partnerships demonstrating that there is a myriad of ways to create climate action entry points for thousands of youth participants.

In Miami-Dade County, Florida, Maria I. Nardi, Devin Meheen, Christopher Bumpus, Maria Padron, Karen Solms, Gabriela Lopez, and Ruben Arce share a range of programs that highlight the long-term vision of climate resilience and action for their communities in one of the most vulnerable regions in the country. They offer a spectacular selection of field cases that provide learning experiences for youth. These include a mobile learning unit that provides "reverse field trips," a marine science learning curriculum providing experiential learning in formal educational environments, guided recreation, and an overarching volunteer program "dedicated to fostering youth engagement in environmental stewardship and climate action through diverse volunteer opportunities and partnerships" in more non-formal educational settings.

Finally, Jess Dominick, Lauren Ford-Peterson, Katherine Wright, and Karen Wang tackle the pressing issue of helping youth (middle school and high school ages) in San Mateo County, California (near San Francisco), to understand some critical climate-related issues in their region, including sea level rise, wildfires, and biodiversity loss, through the county's Youth Exploring Climate Science (YECS) programs. Their case study takes the reader on a journey describing a typical two-hour field trip at Coyote Point Recreation area, where students' experiences build knowledge about pressing challenges and also foster reflection, empowerment, and inspiration.

As you travel through these case studies and activity guides, you will see that engaging the next generation

in climate change conversations and shared learning can take a variety of shapes. There is not one single path to climate action but fostering curiosity about and appreciation for parks and other public lands is key to the journey. The next generation will inherit the Earth, and all of the complexity that we've created. Our challenge is to continue to connect youth to places and spaces, give them tools and ideas, and demonstrate resilience—in other words, teach them how to move forward, in spite of it all. This special issue provides inspiration and tools to empower the next generation's engagement with climate action in public spaces. At a time when the commitment of many political leaders to tackle climate change seems to be flagging, this work has never been more important. Young people are eager to rise to the climate challenge. Let's support them every step of the way!

REFERENCES

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