

CONNECTIVITY AND CORRIDORS

Management Strategy Development for Southern Great Plains Wetlands and Migratory Shorebirds in a Changing Climate



Migratory shorebirds stopping to rest and refuel in the wetlands/Scott Loss OSU

INTRODUCTION

Wetlands across North America's Southern Great Plains (SGP) serve as transitions between terrestrial and aquatic environments, providing ecosystem services and habitats for water-dependent species. Twenty-nine shorebird species, such as sandpipers and plovers, rely on wetlands to rest and refuel during migration. As climate change affects regional precipitation and temperature patterns, many wetlands experience decreased inundation periods. Researchers from Oklahoma State University (OSU) modeled inundation projections, collected shorebird habitat use data, and surveyed land managers to build climate-informed decision tools for wetland and shorebird protection.

KEY ISSUES ADDRESSED

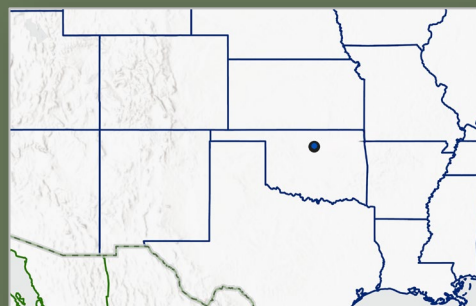
Many SGP wetlands depend on precipitation runoff as their main water source, so the region's most common climate change impacts such as droughts, heat waves, and unpredictable precipitation greatly affect wetland inundation periods. This limits wetland connectivity, threatening the shorebirds that depend on these habitats during migration.

OSU researchers recognized a need to combine inundation models and shorebird habitat use data to better understand climate change impacts on wetlands and migratory waterbirds. They also needed to assess how land managers apply biological study results to wetland management decisions to ensure effective conservation decisions.

PROJECT GOALS

- Model climate projections, watershed characteristics, and land use to identify vulnerable wetlands across the SGP.
- Track migration patterns to assess shorebird responses and habitat connectivity needs.
- Evaluate land managers' needs to tailor research findings for long term adaptation and conservation.

PROJECT LOCATION



PROJECT HIGHLIGHTS

Climate Models Highlight Impacted Areas:

Models show fewer inundated wetlands across a range of climate projection scenarios for the SGP. The greatest decreases in wetland inundation are expected in the northeast. Models indicate more consistent decreases in wetlands during the spring migration season compared to the fall. These results help researchers identify where to focus future wetland conservation efforts.

Combined Shorebird Data Sources Guide

Responses: Researchers collected shorebird migration data using telemetry, GPS methods, and eBird Citizen Science data from 2006 to 2021. Multiple data sources provide insights into shorebird habitat use and adaptation skills across varying precipitation conditions, revealing implications of future wetland changes to shorebirds.

Land Manager Surveys Combine Human

Dimensions and Biological Models: Refuge biologists and state park managers from Nebraska to Texas shared their current management practices, goals, information sources, and climate adaptation barriers through virtual surveys. Results initiated ongoing conversations to identify wetland manager information needs and develop long-term protection strategies based on biological study results.



Short billed Dowitcher/Scott Loss/OSU

LESSONS LEARNED

After the study's initial phases, researchers realized the importance of including stakeholders to develop applicable conservation tools. Human dimensions experts joined the team to expand land manager surveys, using results to guide data displays for climate models, habitats, and species use.

Since most land across the SGP is privately owned, landowners play a key role in wetland protection efforts. Building awareness of wetland benefits like nutrient cycling, water filtration, and biodiversity through research and communication can increase conservation support.

Models of dynamic systems explore multiple complexities. This project combines large datasets for climate projections, wetland inundation, and shorebird habitat use. Unique challenges included considering numerous climate projections and incorporating nuanced citizen science data submissions from eBird. Interdisciplinary work yields results with meaningful applications.

NEXT STEPS

- Continue data collection across the SGP to show shorebird ranges and migration routes.
- Define relevant stakeholder groups to increase collaboration for wetland protection across agency land managers and private landowners.
- Expand private landowner surveys to understand participation in land easements and restoration.
- Develop an online decision-making tool that incorporates wetland projections, species of concern, and climate impacts across locations.

PARTNERS

- See online for full list of partners
- For more information, contact David W. Londe, david_londe@fws.gov



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