



Agricultural Conservation

PLANNING FRAMEWORK

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Agricultural Conservation Planning Framework Implementation Guide for the Natural Resources Conservation Service

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Acknowledgments

This document summarizes research as part of the cooperative agreement between the Natural Resources Conservation Service (NRCS), USDA Agriculture Research Service, and multiple universities and Water Resources Research Institutes (WRRIs) to support the adoption and diffusion of the Agricultural Conservation Planning Framework (ACPF) for Watershed Planning at the NRCS.

The overall objective for the cooperative agreement is to trial the NRCS use of ACPF for watershed planning through watershed pilot projects in new states, training workshops, and an independent assessment of NRCS readiness to utilize the ACPF technology. The overall project objectives include 1) assessing NRCS's capacity to adopt ACPF 2) developing ACPF databases across multiple states and 3) developing training course materials, seminars, and workshops for use by conservation planning professionals at the NRCS in participating states.

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Executive Summary

In 2019 the USDA-Agricultural Research Service (USDA-ARS) awarded a team of researchers to explore Natural Resources Conservation Planning Service (NRCS) use of the Agricultural Conservation Planning Framework (ACPF) in pilot projects across several states (USDA-ARS agreement 59-5030-9-006). The team includes researchers from the Iowa Water Center (IWC), the United States Department of Agriculture Agricultural Research Service, Natural Resources Conservation Service (NRCS), Iowa State University (ISU), Purdue University (PU), University of Wisconsin-Madison, and University of Minnesota Water Resources Center. The interdisciplinary team of researchers were divided into three teams: Technical, Training, and Readiness.

This guide outlines a change management plan and guidance to efficiently manage people and resources in support of introducing the ACPF at a variety of organizational levels within the NRCS and partner organizations. This guide includes 1) an overview of ACPF, conservation planning, and the NRCS, 2) marketing and branding strategy for NRCS and partners, 3) insight to ACPF use, 4) ACPF training and 5) next steps for ACPF adoption by NRCS and conservation partners.

Data for this assessment was collected by the Readiness Team via an exploration of NRCS's organizational structure, as well as interviews (n=37) and online surveys (response rate = 27%) with NRCS staff at a variety of organizational levels who have a range of ACPF awareness.

1. ACPF and NRCS

This section provides an overview of ACPF and outlines its potential contributions to conservation planning efforts and shares a detailed plan for national and state dissemination of the ACPF.

1.1 ACPF Overview - The ACPF is a science-based, flexible, and user-friendly conservation planning tool developed by the USDA-ARS in partnership with the NRCS. The ACPF uses geospatial data and an ArcGIS-based toolbox to support watershed planning in small agricultural watersheds. ACPF's non-prescriptive approach uses high-resolution soils, land-use, and terrain data to identify site-specific conservation opportunities across small watersheds. ACPF can help NRCS and conservation partners facilitate precision conservation, support a watershed approach to conservation planning, encourages stakeholder engagement, increase field visit efficiencies and provide science-based justification for conservation funding.

1.2 National Hub for the ACPF and State Centers - The National Hub for ACPF and State Centers build upon the work conducted as part of this USDA-ARS agreement and facilitates regional and state-wide dissemination of the ACPF. The National Hub for the ACPF also to enhance NRCS conservation planning and practice implementation through the use of the ACPF in state and local NRCS offices. The National Hub and State Centers will support continued expansion, access, and application of data-driven tools to help the NRCS meet water quality goals in local watersheds and larger regions.

2. Marketing and Branding Strategy for NRCS and partners

This section highlights key audience members essential for ACPF adoption by NRCS and conservation partners, provides messaging guidance, and identifies communication channels for ACPF dissemination.

2.1 Key Audience for ACPF Adoption – This section describes NRCS and conservation partners using or impacting ACPF's use can be categorized into four broad categories: 1) USDA and NRCS national and regional leadership, 2) NRCS state office leadership, 3) NRCS and Conservation District field office staff, and 4) conservation partners.

2.2 Messaging Guidance – This section describes messaging topics to use when discussing or promoting the ACPF. Message topics include 1) ACPF contributions to conservation planning partners (i.e., data-driven approach, contributions to NRCS mission areas), 2) ACPF ability to address existing challenges (i.e., increased efficiency, prioritize farmer dialogue, holistic watershed scale planning, enhanced outreach, and preplanning/training opportunities for staff), and 3) Additional opportunities for ACPF with the NRCS and partner organizations (i.e., area- and field-scale planning contributions, outreach opportunities, funding justification).

2.3 Communication Channels – This section describes communications channels used to deliver resources and facilitate a variety of ACPF related conversations. These channels will be hosted or managed by the National Hub and include: ACPF website, annual research meetings, annual meetings with key NRCS leadership, training workshops, publications, and state specific communications.

3. Insight on ACPF use

This section includes enabling and hindering elements related to ACPF use by NRCS and conservation partners and provides insight on how ACPF can address existing NRCS challenges.

3.1 Enabling Elements - Elements enabling ACPF use include NRCS support from both top-down leadership (i.e., USDA and NRCS leadership, NRCS state office staff) and program and planning staff as well as acceptance from local staff working with farmers and landowners in their areas (i.e., field office staff, conservation planners, soil conservationists).

3.2 Hindering Elements – Hindering elements include bureaucratic challenges (i.e., congressional and Farm Bill appropriations and USDA support), program-driven conservation planning (i.e., prioritizing spending program dollars and undermining the conservation planning process), technical challenges (i.e., data availability, compatibility with existing planning infrastructure, expanding use of ACPF beyond the upper Midwest), and staffing challenges (i.e., staff time and resources, adequate ACPF training, change fatigue).

4. ACPF Training

This section outlines existing training resources and shares training recommendations.

4.1 Existing Training Resources— Resources include a watershed-focused application of ACPF workshop, an online on-demand technical training, and a cohort-based technical training.

4.2 ACPF Training Recommendations— Recommendations include: 1) Continue offering Virtual Watershed Applications of ACPF Workshop and Technical Cohort Training for NRCS staff and other conservation partners, 2) Ensure future trainings include adequate contextual information on what the ACPF is, how it can be used at a field and area-wide level, and how it relates to existing NRCS and state-level planning tools, 3) Ensure leadership buy-in for NRCS staff utilization of the ACPF, 4) Continue to engage state-based NRCS partners, 5) Ensure that all trainings include proper information about the types of landscapes and the types of practices ACPF is best suited to address, and 6) Ensure ACPF training is updated as new tools and updates are available

5. Next Steps

This section highlights next steps to build momentum to anchor change related to ACPF use among NRCS and conservation partners. Recommended next steps include: 1) Build a coalition for change that encompasses USDA, NRCS, and conservation partners, 2) Empower ACPF use by integrating ACPF into existing conservation planning infrastructure (i.e., CART/CD), 3) Develop and promote short term wins (i.e., ACPF success stories and training enrollment), and 4) Anchor changes within NRCS and partnering organizations.

Introduction

This document includes guidance for the adoption of the Agricultural Conservation Planning Framework (ACPF) by the Natural Resources Conservation Service (NRCS) and conservation partners. This implementation guide outlines a change management plan and timeline, including tools and techniques, to manage resources and people efficiently. The focus of this implementation guide is to inform the delivery of innovative science and technology to support agriculture productivity, soil conservation, and healthy waters in local and downstream communities. The development of this guide is supported by USDA-ARS service agreement 59-5030-9-006.

This guide can assist in achieving the outcome of successful ACPF adoption with minimal disruption to the agency and is intended for use by those in NRCS' National office as well as NRCS State Leadership in 13 selected states. The selected states were divided into two groups; Current states, and Novel states. Current states are those that have used or are more familiar with the ACPF (Illinois, Indiana, Iowa, Kansas, Missouri, Nebraska, Ohio, and Wisconsin). Novel states are those that have not extensively used or are less familiar with the ACPF (Arkansas, Maryland, Mississippi, Oklahoma, and Vermont).

This document also includes the administrative activities and services provided by the proposed National Hub for the ACPF as well as State Centers in pilot states for the ACPF adoption program. The use of this document can support the introduction and implementation of the ACPF at a variety of organizational levels within the NRCS and partner organizations. Overall, this guide brings together training resources, the use of technical data, and organizational management insights to support ACPF adoption by staff and administrators at the NRCS.

For the NRCS and partner organizations to seamlessly use the ACPF in state, area, and county offices, it is critical to understand how the NRCS functions and to develop an implementation plan that facilitates change in a way that minimizes disruption in activities while increasing efficiency. This readiness assessment, conducted by Purdue University and Iowa State University, aims to evaluate agency preparedness for ACPF, how to include ACPF into 9-Step Conservation Plans, and how to provide partner support. This document also shares practical results from the readiness assessment that can be tailored across different regions of the NRCS.

Overall, this guide addresses: 1) state-level and regional guidelines, expectations, and needs regarding ACPF usage for the NRCS; 2) knowledge about and capacity of NRCS field office personnel to use ACPF output data; 3) readiness of the existing ACPF training infrastructure and programming to support the implementation needs of the NRCS, and 4) broadly explore longer-term implications of future conservation planning fostered by expanded use of the ACPF that can modernize and strengthen NRCS outreach and abilities for targeted conservation planning. Data for this assessment was collected via interviews (n=37) and online surveys (response rate = 27%) with NRCS staff working at different organizational levels. See "Extending ACPF for NRCS; Interview Report" and "Extending ACPF for NRCS; Survey Report" for additional information.

1. ACPF and NRCS

This section provides an overview of ACPF and its potential contributions to conservation planning, then outlines a detailed plan for the National Hub for the ACPF and State Centers to promote and disseminate ACPF.

1.1 ACPF Overview

MISSION: To improve the efficiency and effectiveness of conservation planning researchers and professionals through data-driven approaches to meet water quality and soil health goals in local watersheds and larger regions.

VISION: To advance science and practical application of geospatial conservation data to enable a resilient future for agricultural productivity and the environment.

The ACPF is a conservation planning tool developed by the USDA-ARS in partnership with the NRCS that uses geospatial data and an ArcGIS-based toolbox to support watershed planning in small agricultural watersheds. ACPF's non-prescriptive approach uses high-resolution soils, land-use, and terrain data to identify site-specific conservation opportunities, enabling landowners and conservation professionals to select appropriate conservation practices that can address both on-farm and community-wide resource concerns. The ACPF facilitates precision conservation and enhanced stakeholder engagement by helping conservation staff and partners work with farmers and communities to identify conservation opportunities and inform the development of effective watershed planning.

The ACPF is a science-based tool that uses the conservation pyramid as its conceptual basis by emphasizing soil health and effective use of multiple practices to address resource concerns in small agricultural watersheds. Paired with local knowledge of resource concerns, landscape features, and local practice preferences, the ACPF identifies site-specific locations favorable for a variety of structural conservation practices. The ACPF helps users prioritize practices then generates detailed output maps that highlight conservation opportunities at both watershed and field scales.

The ACPF focuses on subwatersheds at a 10,000-40,000 acres or hydrologic unit code (HUC) 12 in size and can also support conservation efforts on both smaller and larger scales (i.e., field - and landscape-scale). This small watershed approach encourages stakeholder participation and enables participants to address a variety of resource concerns relevant to their community. With this approach, the ACPF can generate information at an actionable scale. ACPF's site-specific recommendations enable landowners and conservation professionals to select practices that address on-farm priorities as well as broader community-wide goals.

In sum, ACPF is a science-based, flexible, and user-friendly, decision support tool that can:

Facilitate precision conservation by identifying vulnerable areas on the landscape and helping farmers and conservation staff prioritize based on local objectives.

Support watershed planning by generating hydrologic information at an actionable scale and helping landowners understand their property and its impact within the context of a watershed.

Promote the watershed approach by emphasizing goal-setting and impacts of nutrient management practices on a watershed-based scale.

Encourage stakeholder engagement by fostering broader conversations among stakeholders and incorporating input from farmers, drainage authorities, county supervisors, and program managers.

Increase field visit efficiencies by providing conservation professionals the opportunity to conduct pre-planning activities and focus on the highest priority conservation opportunities on their client's property.

Provide science-based justification for conservation funding by producing output maps that deliver a science-based vulnerability assessment at the landscape scale. These assessments can help direct limited conservation dollars across the landscape in a well-informed manner.

ACPF and the NRCS

The NRCS is an organization centered on a vision of clean and abundant water, healthy soils, resilient landscapes, and thriving agricultural communities through voluntary conservation. This vision is intended to be foundational to the work staff completes and provides guidance as they are faced with the complexity of ever-changing Farm Bill policies, competing priorities, and shifting market demands. For NRCS to increase efficiency, the institution should consider a paradigm shift to holistic, comprehensive conservation planning that prioritizes the land and farmer, utilizes up-to-date geospatial data, and fulfills staff needs.

The tenets of conservation require resource inventory and assessment, technical assistance, and a farmer's commitment to conservation implementation. In the long term, these principles lead to productive lands, a healthy environment, and an enhanced agricultural landscape. The NRCS aims to deliver high-quality science and technology while promoting productive working lands and healthy waters. The ACPF enables meeting this goal by using geospatial information to automate the first phase of the conservation planning process by identifying problems and opportunities. This allows staff to prioritize field visits and dialogues with the farmer to determine objectives and further inventory resources through an iterative process that begins with map outputs (i.e., ACPF outputs) and is driven by local knowledge.

The ACPF can address staff needs by increasing organizational effectiveness and efficiency by integrating with existing planning infrastructure, specifically Conservation Desktop (CD) and Conservation Assessment and Raking Tool (CART) so geospatial data and conservation practice options can be shown seamlessly with other data in the conservation planning process. The ACPF can enhance the nine-step conservation planning process by enabling quality assurance and uniform guidance for providing conservation recommendations. The tool may also help train a new generation of staff to site practices in the field with ACPF outputs as a guiding tool. Nothing will replace getting in the field and having a dialogue with farmers and landowners, but the ACPF toolbox can amplify holistic planning efforts so NRCS staff can prioritize walking the farm with a farmer or landowner and jointly making decisions that benefit the land and the farmer.

1.2 National Hub for the ACPF and State Centers

Mission: To improve efficiency and effectiveness of ACPF implementation in NRCS offices through the continued expansion of data-driven approaches to meet water quality goals in local watersheds and larger regions.

Vision: To complement and assist NRCS in the advancement of science and practical application of geospatial conservation data to improve soil health and water quality.

The objective of the National Hub for the ACPF is to increase the efficiency of NRCS staffs' role in improving water quality. This National Hub, housed at Iowa Water Center at Iowa State University, builds on the USDA Agricultural Research Service agreement 59-5030-9-006 that trialed the NRCS use of ACPF in pilot projects across several states (2019-2021). The National Hub can help enhance NRCS conservation planning and practice implementation through the use of the ACPF in local NRCS offices. The National Hub will support continued expansion, access, and application of data-driven tools to help the NRCS meet water quality goals in local watersheds and larger regions.

National Hub for the ACPF Products and Services

Products

- ACPF
 - ACPF HUC12 Database
 - ACPF Toolbox and users' manual
- ACPF outputs for 9-Step Conservation Planning Process and Conservation Desktop/CART integration
- Web service-based ACPF results delivery
- ACPF website
- ACPF training resources

Services

- Database and toolbox maintenance
- Data processing and preparation
- Data inventory and storage
- Technical assistance
- Software maintenance and version updates
- Consultation and guidance for adopting ACPF for conservation planning
- Training & outreach for conservation planning professionals

National Hub for the ACPF Teams

Administrative

- *Richard Cruse*
Iowa Water Center
- *Emily Zimmerman*
Iowa State University
- *Hanna Bates*
Iowa Water Center

Technical

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- *Robin McNeely*
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- *Claudette Sandoval-Green*,
Iowa State University

Training and Outreach

- *Rebecca Power*
University of Wisconsin-Madison
- *Anne Nardi*
University of Wisconsin-Madison

National Hub for the ACPF Products and Services

Administrative

- Project management and long-term strategic development of the National Hub to serve the NRCS and NRCS partners
- Coordinate with selected state technical advisory committees on ACPF use, conservation planning, and conservation practice implementation within selected states.
- Identify priority watersheds within each state to adopt the ACPF for conservation planning and practice implementation
- Serve as point of contact for NRCS administrative offices
- Manage reporting requirements
- Collaborate and maintain relationships with a national network of ACPF-related researchers, specifically others with agreements established with the NRCS

Technical

- ACPF input data storage and management
- ACPF database maintenance
- ACPF toolbox maintenance
- ACPF data processing
- ACPF delivery to selected states
- Website for ACPF downloads (inputs/ outputs)
- Data availability for NRCS system access in ArcGIS online
- ACPF output data and map adaption for CD and CART
- ACPF toolbox processing with selected states for specific nutrient management goals
- ACPF training and online forum participation with the Outreach and Training Team

Training and Outreach

- Provide ACPF training materials that can be adopted for professional development of NRCS employees
- Hold in-person and online trainings with NRCS staff and partners in selected states for technical use of ACPF and ACPF output data and map interpretation for conservation planning
- Maintain and refresh ACPF online training resources as necessary

National Hub for the Agricultural Conservation Planning Framework

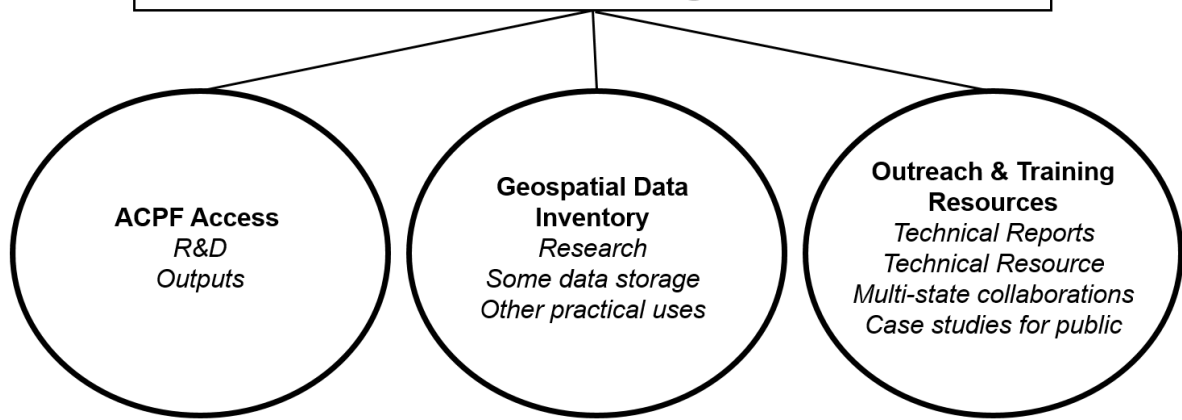


Figure 1. National Hub for the ACPF components—Three primary activities make up the National Hub for the ACPF: (1) ACPF tool development and output delivery, (2) geospatial data inventory and innovation, and (3) outreach and training resources. Technical data and map outputs will be available through the National Hub for the ACPF.

ACPF Access

- Develop, test, and manage the provision of ACPF tools
- Ensure quality assurance, quality control of tool development, and tracking and collaborating on innovations and modifications at the state level
- Host ACPF tool for delivery to State ACPF Centers
- Provide technical and strategic planning assistance for ACPF use, including providing outputs to NRCS

Geospatial Data Inventory

- Format datasets for NRCS planning tools and processes
- Update, maintain, and ensure quality assurance, quality control of current datasets for ACPF tools
- Collaborate on creating and formatting innovative datasets for application in ACPF tools
- Host ACPF datasets for delivery to State ACPF Centers

Outreach and Training

- Provide standard training resources through online modules and in-person training workshops for NRCS staff and partners
- Provide training resources for use and interpretation by GIS practitioners
- Provide technical training and map interpretation resources for state and field offices
- Provide case studies, technical reports, job sheets, and memos addressing ACPF use in conservation planning
- Foster research aims to extend the utility of geospatial technologies for enhancing conservation planning

Technical Data

Collaboration can occur to determine what state/watershed goals and outputs can be customized to meet stakeholders needs. This can involve collaboration with National Hub for the ACPF staff, NRCS staff, and conservation partners. Data verification following map delivery is required for the accuracy of data.

Map Outputs

ACPF can be delivered to participating states and partners through multiple online venues. A website will be available for ACPF downloads, including input and output data. Specific for the NRCS, data can be available through system access in ArcGIS online for use within CD and CART.

National Hub Staff

Two new hires will support the day-to-day function of the National Hub. These positions will have a variety of duties to support information gathering among a network of ACPF researchers, as well as support efforts to provide products and services to participating states and State Centers that adopt the ACPF for conservation planning.

Program Coordinator

This position will be housed at Iowa State University in the Iowa Water Center. This position will be the point of contact for NRCS state offices and state partners to coordinate ACPF with state conservation priorities and ACPF access to priority watersheds and other landscapes. This position will work with the administrative, technical, and training teams and will also be the primary executor of the marketing and communications plan for ACPF adoption.

Postdoctoral Associate

This position will be housed at Iowa State University under the Natural Resources Ecology and Management department. This position will assist with technical and programmatic needs related to the ACPF database/tool updates and application of current and additional ACPF database/tools with selected states and across broader geographical scales. This position may also assist with training related to conservation planning and application of the ACPF, and participate in activities as needed by the Program Coordinator.

Research and Development

While version 3 of ACPF is currently available, research and development are in progress to improve the tool (e.g., include more conservation practices to address a growing range of resource impairments). Further research is in progress to incorporate water quantity issues, estimate nitrogen and phosphorus loss in pounds, and provide expanded decision support based on socioeconomic data that examines direct and indirect costs of practice implementation and maintenance. The National Hub will interface with scientists working to expand the tool. As improvements are added, the improved tool can then be offered to the National Hub audience.

A vast research network exists across the natural and social sciences to address the use of ACPF in different contexts, as well as assess the effectiveness of targeted conservation strategies upon a variety of landscapes. The National Hub will coordinate annual meetings with researchers to receive up-to-date information on research topics related to ACPF. A resource library will also be available on the National Hub website to disseminate information related to ACPF use for NRCS staff, partners, and the public.

Existing Resources

Resources for the project include facilities, personnel, and expertise of project personnel

- *Facilities at Iowa State University:* Support the project through computing and storage capacity for ACPF data processing, maintenance, and storage.
- *Personnel:* ACPF-experienced teams located at Iowa State University and University Wisconsin-Madison will carry out activities to meet objectives and goals.
- *Expertise:* Members within each team have developed knowledge regarding ACPF data delivery and ACPF adoption by NRCS staff through previous experience, including work conducted through the USDA Agricultural Research Service agreement 59-5030-9-006 that trialed the NRCS use of ACPF

ACPF State Centers

The ACPF State Center will work directly with the NRCS State Conservationist(s) to provide data specific to each state's needs/goals. These ACPF State Centers will be established with other institutions and interested partners who will work in conjunction with the National Hub. The State Centers will be guided by the National Hub to coordinate with NRCS, conservation planning partners, technical advisory boards, and state institutions to inform and expedite conservation planning priorities through the use of the ACPF. The ACPF State Centers will be guided/encouraged to conduct the following activities:

- Support the use of ACPF and facilitate ACPF access for NRCS field staff and partners.
- Work with the National Hub to adapt ACPF to meet local needs, state conservation priorities, and NRCS practice standards.
- Review and validate ACPF outputs and provide feedback to the National Hub.
- Address specific state needs with ACPF database development and management.
- Provide feedback to the National Hub to enhance dataset development and delivery.
- Coordinate training needs with the National Hub and assists in information dissemination.
- Assist the NRCS with assessing conservation planning outcomes at multiple scales.
- Participate in regional networking in collaboration with the National Hub.

National Hub for the ACPF Interaction with NRCS

The overall goal of this National Hub is to provide conservation planning services to improve the efficiency and effectiveness of NRCS staff to meet local and area-wide conservation goals. The National Hub will provide services and products to enable the adoption of the ACPF with minimal disruption to existing NRCS activities in field, area, and state offices. Data use support, training, and other resources will be provided in collaboration with NRCS leadership and can be integrated in a way that does not increase the scope of work or workloads of NRCS staff members.

Collaboration with the Deputy Chiefs Offices

The National Hub may collaborate with the Deputy Chiefs Offices underneath the NRCS to collaborate on datasets and data use, as well as potentially informing policy and federal programs that the ACPF can serve through conservation planning (Fig 2).

Deputy Chief of Soil Science

- Communication and data collaboration regarding the resource inventory, soil survey, and resource assessment

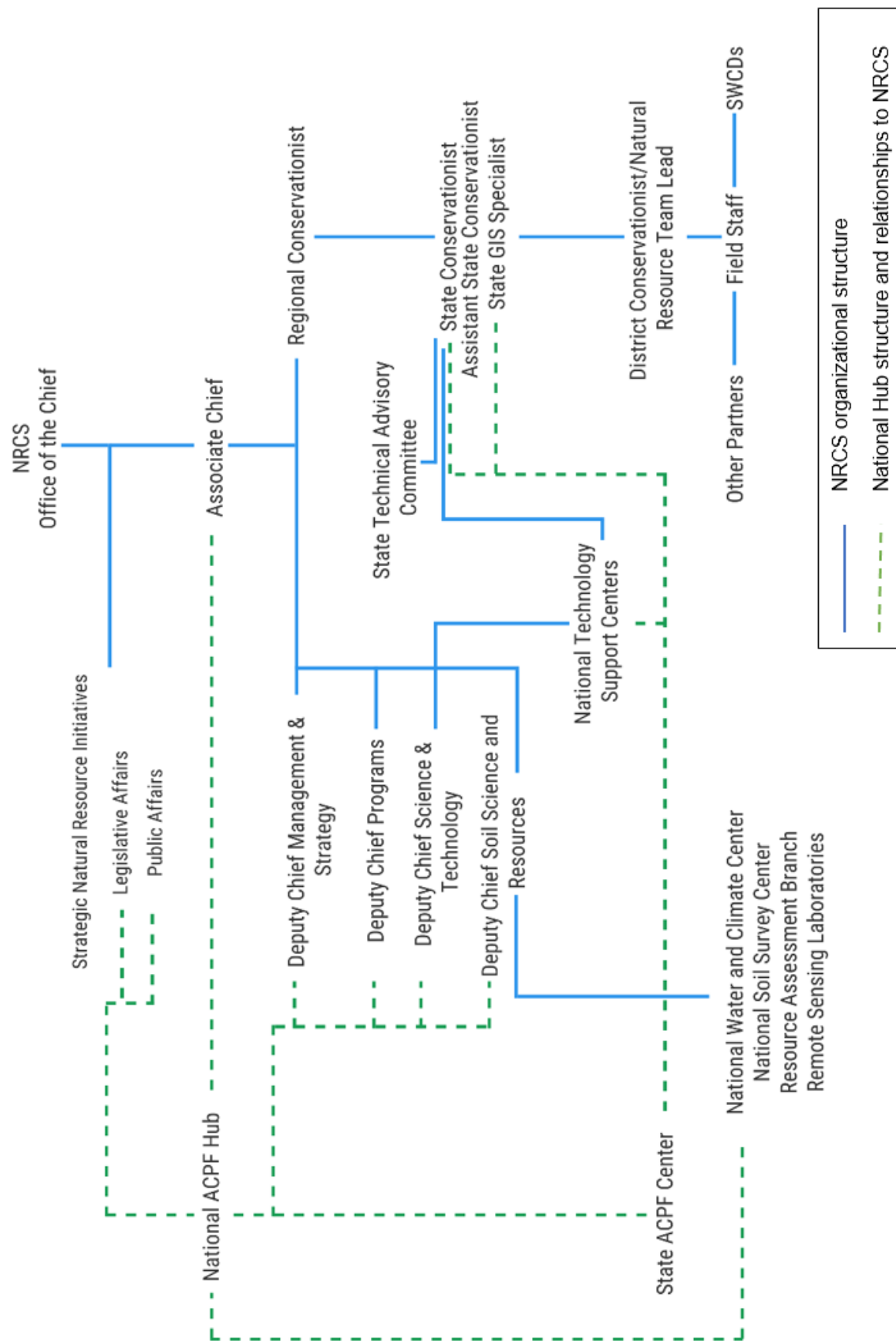
Deputy Chief of IT

- Coordination and integration of ACPF dataset, tool, output maps into available software at the NRCS, such as CD/CART
- Coordination and communication regarding ACPF data file structure and management
- Coordination of IT support for ACPF related inquiries and troubleshooting

Deputy Chief of Programs

- Coordination and communication regarding:
- Area wide planning, conservation planning, and easement programs
- General outreach and partnerships
- Watershed programs and water management

Figure 2. NRCS and National Hub organizational structure and interactions



Timeline for Establishing the National Hub for NRCS

To establish the National Hub, the initial steps include establishing the administrative infrastructure to serve the NRCS for training resources, tool and data requests, and other supporting information. Following administrative setup, the National Hub will include data access, training, and ACPF implementation strategies in select states determined by the agreement.

Establish an Administrative Infrastructure (1-6 months)

- Establish National Hub website as a comprehensive ACPF resource for NRCS staff and conservation partners. Resources include ACPF data, training, resource library and peer-reviewed research, and NRCS-specific resources for integration into NRCS tools
- Develop a framework for, and endorse the use of GIS web services for providing access to ACPF results within NRCS business tools (e.g., CD/CART)
- Create NRCS specific marketing awareness and branding for the National Hub so that key stakeholders are aware of products and services offered
- Establish data storage equipment to meet NRCS capacity and security requirements
- Establish annual meetings for researcher updates on the use of ACPF and approaches to targeted conservation on the landscape

Start-Up Product/Services Activities (4-24 months)

- Coordinate with each state's NRCS leadership, technical committees, and applicable NRCS field offices on a routine basis to select priority watersheds, provide ACPF data and services, as well as inform ACPF use and conservation goals within the state(s)
- Coordinate with NRCS National Technology Support Centers regarding data delivery, IT support, and collaboration on integrating data into NRCS business tools.
- Launch ACPF Version 3 to NRCS users
- Tool introduction and plans for training
- Outreach to key NRCS staff members
- Anchor ACPF use within conservation planning and program delivery culture
- Prepare ACPF data for watersheds identified by NRCS and partners
- Access to ACPF output data and maps for priority watersheds as identified state NRCS and partners
- Offer training programs to NRCS employees and partners (online, in-person)

Expansion for Products/Services Initiatives (24-36+ months)

- Obtain feedback to enhance datasets, toolbox, and other services and products.
- Coordinate with USDA-ARS and partners on separately funded ACPF agreement.
- Establish communication and collaboration as determined by data availability and interest in adoption to initiate product and service delivery of ACPF. Establishing these relationships can begin product and service activities for ACPF adoption and use within these states to expand the region the National Hub serves.
- Develop plans for subsequent National Hub steps that build on the success of this project.

Future Strategic Direction

The above captures the first three years of establishing and operating the National Hub. We anticipate connecting a network of conservation planning researchers and professionals to addresses current opportunities as well as long-term needs. As a result, the Iowa Water Center is prepared to lead this National Hub on a long-term basis as the need evolves.

Initiatives addressed in months 1-36 are based on data and experience from the first phase of the cooperative agreement with NRCS (2019-2021). Items listed address start-up and geographic expansion needs corresponding to current efforts led by the Iowa Water Center. Initiatives can address improving products and services as well as expanding the segment of NRCS staff and geographical areas currently served.

Initiatives addressed in 36+ months following the start date will be updated/addressed as new data and needs are identified by work with the NRCS. Data collected in the first phase of the project indicates the importance of providing training and certification for a new generation of NRCS employees across the country, a suite of tools to address a variety of natural resource priorities with emphasis on soil protection, and tailoring conservation planning to meet unique state needs. The National Hub will be positioned to be responsive and flexible to the NRCS needs as well as changing technologies related to geospatial data analysis in conservation planning.

Evaluation

A series of metrics will be used to evaluate the progress and success of the National Hub as a resource for NRCS as well as meeting quantitative goals in conservation planning and data delivery. Successful establishment of the National Hub will be observed through the delivery of data to watersheds within multiple states with the successful use of ACPF in the conservation planning process. The metrics will be measured on an annual basis in years 2 and 3 through reporting from selected state field offices and partners within the priority watersheds in this project. As the below metrics are met, they will document project success and rate of expansion to serve other states. In subsequent years, new metrics will be established to measure the success of ACPF implementation.

The following metrics will be used:

- # of NRCS staff enrolled in ACPF results/map output training across selected states (online and in-person). (Year 2: 100, Year 3: 150)
- # of new watersheds added to the National Hub database (Year 2: 500, Year 3: 500)
- # of ACPF Toolbox downloads annually (Year 2: 100, Year 3: 100)
- # of data requests/downloads of ACPF core data (Year 2: 1800, Year 3: 2000)
- # of data requests/views of ACPF results data via AGOL (Year 2: 1000, Year 3: 1500)
- Priority watersheds identified for ACPF data requests/downloads, output data and maps (Year 2: 20; Year 3: 25)

2. Marketing and Branding Strategy

The following outlines the marketing and branding strategy of the ACPF for the NRCS and partner organizations involved in conservation planning. This strategy includes key audience members and their role in ACPF adoption, messaging guidance, and approaches for ACPF use by NRCS and conservation partners that aligns with mission areas and key communication channels as determined by data acquired by the Readiness Team.

2.1 Key Audience for ACPF Adoption

The NRCS policies and programs implemented to meet water quality goals in the United States are nested within a complex system that occurs from the national level to field-scale. Before the adoption of ACPF can be considered, it is critical to map the relationships of entities who play essential roles in shaping conservation efforts. Entities include 1) Congress, USDA, and NRCS leadership 2) NRCS state office staff, 3) NRCS and Conservation District (CD) field office staff 4) Public and private partners (i.e., state and federal agencies, engineers, contractors, and NGOs) and 5), farmers and landowners.

The primary audience for ACPF adoption is the USDA and NRCS. The NRCS sets practice standards and signs-off on the conservation planning process before practices are considered for federal financial programming, a key driver for practice adoption. Non-NRCS conservation partners are a secondary audience that supports NRCS conservation efforts in a variety of roles outlined below. Lastly, the farmer/landowner is a tertiary audience for the ACPF because they receive services and programs from NRCS staff and partners, making them an indirect recipient of the ACPF toolbox. By primarily reaching-out to conservation service providers with ACPF adoption, the services and products can more efficiently be offered to farmers and landowners.

2.1.1 USDA and NRCS National and Regional Leadership

At the national level, Congress legislates directives and determines appropriation through Farm Bill programming while the USDA performs higher-level leadership, program development, and implementation as directed by Congress and the presidential administration. As one of eight mission areas under the USDA, Farm Production and Conservation (FPAC) is where stewardship and agricultural productivity meet. Under this mission area, the FPAC Business Center, NRCS, Farm Service Agency, and the Risk Management Agency interact to mitigate risks, provide conservation programs and technical assistance, and deliver financial programs to their clients (<https://www.usda.gov/our-agency/about-usda/mission-areas>).

In the long run, ACPF has the potential to impact federal Farm Bill appropriation programs by identifying combinations of practices on the landscape to meet water quality goals. In turn, quantifying conservation practices on the landscape can help estimate appropriations to specific programs that work towards meeting water quality goals on the landscape. This is a larger-scale approach to using ACPF that would occur on a longer-term basis as data are generated across multiple geographic regions and cropping systems in the Midwest and beyond. ACPF audience at the national level is described in Table 1.

Table 1. ACPF Adoption Who-What-Where Matrix: National leadership

Who	Interaction with ACPF	Where
Congress	<p>Determines federal programming and conservation appropriations through the Farm Bill.</p> <p>Availability of federal conservation planning funding impacts use and applicability of ACPF map outputs at the state and field office level.</p>	Washington DC
USDA-FPAC	<p>Established in the 2014 Farm Bill, this position encompasses USDA’s domestic-facing agencies: Farm Service Agency, NRCS, and Risk Management Agency.</p> <p>FPAC plays a role in ACPF adoption due to large-scale management processes directed through this mission area.</p>	Washington DC
NRCS National Headquarters	<p>NRCS information and policy directives start at the Office of the Chief at National Headquarters and flow to the Regional Offices.</p> <p>The National Hub will collaborate with the Deputy Chiefs Office for data sharing and program direction.</p>	Washington DC.
NRCS Regional Conservationist	<p>Leadership representatives are responsible for directing NRCS programs and activities. These regional representatives work to ensure regional resource needs are addressed.</p> <p>These key decision-makers can promote ACPF within their region by promoting its contributions to conservation planning.</p>	Regional offices representing multiple states.

2.1.2 NRCS State Leadership

As noted above in the guide, the NRCS is a multi-level organization. This section primarily focuses on NRCS State and Area leadership in the State Conservation Office focusing on conservation implementation. This audience segment, (Table 2) is critical for ACPF adoption because they set state-level goals and provide guidance to field office staff who work with local communities to implement conservation practices. At times, nationally set priorities and conservation practices are difficult to implement at the state level. State priorities vary and are informed by state advisory boards or technical committees, while land-use decisions are made by farmers, ranchers, and landowners.

The State Conservation office consists of a myriad of administrative and technical personnel that set state approaches for conservation, as well as provide training, resources, and support to field office staff. The State office personnel are opinion leaders within the state for field and area office personnel. Individuals within this office, including the State Conservationists themselves, are thought of as key positions to facilitate ACPF adoption within the NRCS. Without support from state leadership, ACPF adoption would face significant challenges within the agency

Key State Conservation Office Personnel:

- Assistant State Conservationist - operations
- State Program Specialists
- IT Specialists
- Engineering Staff
- State Resource Conservationists
- State Soil Scientist
- Assistant State Conservationists - Programs
- State and Area GIS Specialists
- Area Resource Conservationists
- Area Program Specialists
- Area Civil Engineer
- Area Soil Scientist
- Area Agronomist
- Business Tools Specialist
- State Environmental Specialist
- Program Assistant Farm Bill

It is at this level the technical use of ACPF would be considered. The purpose of the technical teams associated with the National Hub and State Centers is to develop ACPF map outputs that meet goals and priorities established by each state. State GIS Specialists may be interested in working with or having access to ACPF inputs available as they have the technical expertise to work with the data within their positions.

At this level, the National Hub Program Coordinator supports the use of ACPF in conservation planning with key messaging and dissemination of ACPF training to field office staff. The National Hub Program Coordinator can also work with state-level technical advisory groups, NRCS leadership, and others to develop water quality goals that inform ACPF data processing of the technical team.

Table 2. ACPF Adoption Who-What-Where Matrix: NRCS state-level leadership

Who	Interaction with ACPF	Where
Area/State Resource Conservationist and staff	<p>Respond to needs of employees regarding program delivery, conservation planning, and training needs of staff. These individuals also troubleshoot challenges and identify success stories within a state.</p> <p>This role is important to ACPF use, as they are part of a team that directs and oversees conservation planning efforts in their state.</p>	State or Area offices
State Soil Conservationist and staff	<p>Primary leaders for new initiatives and priorities for each state. They are identified as key facilitators of change.</p> <p>This role is important to ACPF use, as they are part of a team that directs and oversees conservation planning efforts in their state.</p>	State office
Assistant State Conservationist -Operations and staff	<p>Responsible for improving the state’s day-to-day operations management, streamlining business practices, data management, and quality assurance activities.</p> <p>This role will be important to engage as ACPF is incorporated into conservation planning processes across each state.</p>	State office
State GIS Specialist and staff	<p>Provide technical support and coordinate training for technological changes across the state. Provides additional GIS support in each area office. Provides the first line of Technical Assistance support to the field office level.</p> <p>This individual plays a key role with ACPF use from a technical standpoint in collaboration with the National Hub and State Centers to collaborate on customized information delivery to state field offices.</p>	State office
State Technical Committees (STC)	<p>Provides comment on state-specific natural resource concerns, collects information from scientific assessments, and makes recommendations for their state. These groups vary by state and are intended to represent state-wide priorities, research, and agency representatives.</p> <p>STC members can play a key role in ACPF adoption by communicating interest and value in ACPF outputs to NRCS conservation planning efforts.</p>	States

2.1.3 NRCS and Conservation District Field Office Staff

The ACPF has the potential to impact conservation planning at the field office level by integrating into field-scale conservation planning through the nine-step conservation planning process (Table 3). Traditionally within the NRCS, the conservation planning process is followed by an exploration of federal programs to fund conservation practices discussed between the field staff and the farmer or landowner. The ACPF complements this process by using a data-driven approach to determine effective practices and their placement within a HUC-12 watershed.

NRCS and CD Field office staff organization is specific to each state. These offices can be organized as natural resource districts (watershed-based), county offices (political county boundaries), or natural resource teams (serve several counties within a cluster). Natural Resource Districts (NRD), Soil and Water Conservation Districts (SWCD), Soil Conservation Districts (SCD), and Resource Conservation and Development Councils (RC&D) are all included as boots on the ground staff working directly with farmers and landowners, as well as local partners, to deliver conservation planning and federal program services.

Key Field Office Personnel*

- District Conservationists
- Resource Team Leader
- Conservation Assistants
- Soil Conservationists
- Resource Conservationists
- Wetland Specialists
- Environmental Specialists
- Engineering Technicians
- GIS Specialists
- CD staff

*not all positions are staffed in every office

This audience conducts the nine-step conservation planning process with individual farmers before submitting applications to federal programs for financial assistance and aims to provide a comprehensive structure that factors in natural resource and farmer needs within the landscape. However, often due to staff capacity issues, federal Farm Bill program deadlines, and other issues, the conservation planning process is not followed as it is intended to be done. This is an opportunity for the ACPF toolbox to support the planning process as it complements many steps and reduces computer time spent gathering data and assessing farmer's fields.

Field office staff would only receive ACPF map outputs and would not be expected to run the toolbox. These map outputs would be accessible as downloads from ArcGIS online to be accessible within CD and CART for use with farmers and other outreach strategies pursued by the field office. The ACPF map outputs would be integrated into these tools to enable ease of use and be considered within the context of other data collected in the conservation planning process. The ACPF map outputs would be data layers that could be edited during conversations with farmers as planning progresses.

ACPF map outputs would have additional use in any outreach strategies deployed by field offices, such as community meetings or informational letters out to farmers within their service area. Outreach opportunities from the National Hub for the ACPF would be a suggested approach at the field office staff's discretion as some areas of farmers are more receptive to active outreach than others.

Table 3. ACPF Adoption Who-What-Where Matrix: Local NRCS and CD office staff

Who	What	Where
District Conservationists	<p>Implements NRCS strategic plan, goals, and priorities. These individuals are conservation leaders in their communities and assist in implementing conservation practices with farmers.</p> <p>ACPF would serve a role within their offices for conservation planning as well as farmer and landowner outreach. This position's local leadership and interest in the ACPF are important to adoption.</p>	County offices or NRDs.
NRCS field office staff	<p>Assists with conservation planning and implementation.</p> <p>ACPF would serve a role within their offices for conservation planning as well as farmer and landowner outreach. ACPF map outputs would be used in this role as part of the nine-step conservation planning process.</p>	County offices or NRDs.
CD staff	<p>Work in conjunction with the field offices to conduct conservation planning activities. CD staff includes SWCD, NRD, SCD, and RC&D staff, depending on each state's organizational structure.</p> <p>ACPF would serve a role within their offices for conservation planning as well as farmer and landowner outreach. ACPF map outputs would be used in this role as part of the nine-step conservation planning process.</p>	Located in conjunction with NRCS field offices throughout the states.

2.1.4 Conservation Partners

Partners play an essential role in conservation planning and goal setting conducted by state NRCS offices. Partners participate in state technical advisory boards to set state-wide goals and conduct conservation planning and practice engineering at the field office level. Partners are integral to the development and dissemination of ACPF at the state level (Table 4) and include state conservation agencies, federal and state scientists, universities, non-governmental organizations, and the private sector. Partners are critical as they are a conduit through which the work of the National Hub for the ACPF is delivered to state NRCS and other supporting entities who deliver conservation to farmers at the local level. Farmers are the ultimate end user of ACPF map outputs because they decide to adopt conservation practices on the landscape.

As State Centers are developed, these centers can more directly coordinate with conservation planning partners, technical advisory boards, and state institutions to inform conservation planning priorities for running the ACPF. In the short term, the National Hub for the ACPF can facilitate and foster regional discussions to coordinate database development, delivery of training, and ACPF usage among partner organizations.

Primary partners include:

- State conservation agencies
- Universities and University Extension Professionals
- Conservation and agricultural organizations
- Indigenous settlements and coalitions
- Non-profit organizations
- Private sector firms

Producers and landowners often receive services through individual, farm, or field contracts rather than holistic conservation planning at the watershed scale. They are the end-user of conservation planning products, and they voluntarily adopt conservation practices based on planning, recommendations, cultural and belief systems, personal economics, cost-share availability through federal programs, and land use consideration. NRCS and other partners work with landowners to voluntarily adopt conservation practice opportunities to address resource concerns. The ACPF provides landowners and farmers the ability to visualize a menu of conservation practice options for their land along with the associated potential for reduction in nutrient losses.

Who	What	Where
National Hub for the ACPF	Facilitate the adoption of ACPF by NRCS, including the development and maintenance of data and the toolkit, assessing readiness and creating an implementation plan and training materials, and the establishment of a support network of national and state centers to support the above efforts.	Iowa Water Center at Iowa State University.
NCRWN	North Central Water Region Network is a 12-state collaboration that enhances connectivity across regional water projects, develops outreach and education efforts, and coordinates projects with measurable environmental and social impacts. This connection to professionals across the state, including NRCS partners, will aid in collaboration and connection to state partners to support ACPF use and adoption.	Located in 12 states in the Midwest.
WRRRI	Water Resources Research Institutes (WRRRI) are a national network created by Congress in 1964. WRRRIs often participate in STCs and others to develop state-specific conservation goals. WRRRIs support a network of researchers addressing conservation and water quality who could inform ACPF use.	Located in 50 states and 4 US territories in the US.

Who	What	Where
NASCA	National Association of State Conservation Agencies (NASCA) include key decision-makers that can promote ACPF within their region and state by promoting its contributions to conservation planning.	National organization with state presence
NACD	National Association of Conservation Districts (NACD) Includes key decision-makers can promote ACPF within their region and state by promoting its contributions to conservation planning.	National organization with state presence
NARCDC	National Association of Resource Conservation and Development Councils (NARCDC) includes key decision-makers can promote ACPF within their region and state by promoting its contributions to conservation planning.	National organization with state presence
Federal State Scientists	Collecting, assessing, and validating the data inputs for ACPF.	Centers/univ. throughout the state
State Extension – Land Grant Institutions	Extension provides complementary services to NRCS that aids farmers in conservation decision-making. ACPF provides data to inform conservation efforts in specific watersheds and guide on-the-ground conservation activities.	Extension offices located throughout each state.
NGOs – General	Provides organizational membership to farmers and landowners regarding information and management resources for farm management. ACPF provides data to inform conservation efforts in specific watersheds and guide on-the-ground conservation activities.	Located on a state-by-state basis
NGOs – State Partners	Work with NRCS through cooperative agreements to assist with conservation planning, practice design and construction, and outreach/communication on conservation to their audiences. ACPF provides data to inform conservation efforts in specific watersheds and guide on-the-ground conservation activities.	Located on a state-by-state basis
Service Providers	Private companies that sell products and consulting services to individual farmers and landowners within the context of the field as a financial asset (i.e., retailers, CCAs, agronomists, land management companies). Decisions and sales could be completed within the context of ACPF regarding high and low ROI areas of the farm.	Located in regions throughout states.
Private Sector Planning Firms	Private companies that provide technical assistance, watershed planning, and services with a variety of tools to watersheds, counties, and municipalities. ACPF provides data to inform conservation efforts in specific watersheds and guide conservation activities.	Multi-state
Watershed Coalition Groups	Individual volunteers who organize outreach efforts, data collection, and engagement with those within their watershed. Often seek out funds and technical assistance for watershed assessments. ACPF provides data to inform conservation efforts in specific watersheds and guide on-the-ground conservation activities.	Located in a watershed (HUC size varies)
Farmers and Landowners	An end-user of ACPF that voluntarily adopts conservation practices based on planning, recommendations, cultural and belief systems, personal economics, cost-share availability through federal programs, and land use consideration. ACPF provides data to inform conservation efforts in specific watersheds and guide on-the-ground conservation activities.	Private individuals located throughout the states operating farms.

2.2 Messaging Guidance

The following are key messaging strategies derived from qualitative data collection and analysis from NRCS staff at multiple levels within the organization. Please refer to “Extending ACPF for NRCS; Interview Report” for further detail.

2.2.1 ACPF Contributions to Conservation planning

Data-Driven Approach to Conservation Planning and Implementation

Water quality impairments across the US are a decades-long problem that is being exacerbated by the increasing impacts of climate change. There is growing support for the use of geospatial data to support conservation decision-making by NRCS and conservation partners. Geospatial data provides science-based information to help achieve conservation goals at multiple and enables a technical approach to address a variety of conservation priorities within a state or region.

Although geospatial data provides critical information to start the conservation planning process, it is not intended to replace ground-truth data or field visits. Rather, it is a starting place to create a dialogue with the farmer in respect to conservation options for their field. The use of this technology can increase the efficiency and consistency of the conservation planning process from planner to planner. This uniform guidance to identify conservation practices enables a consistent approach to identify conservation planning opportunities.

“I think spatial data is the bee's knees and we can learn a lot from it. We could use it to make science-based decisions. If it's spatial data that's been ground truthed, we could make a lot of decisions based off that. It creates a consistency. If we're all using the same process, the same data, then our process becomes more consistent throughout the state. If everyone's making it up on their own and some are using spatial data and some are using pen and paper then our consistency and accuracy won't be as strong across the state. I think we could use spatial data to be more efficient and consistent, and decrease variability in our decision making and planning across the state.” Current state

The data-driven information provided by ACPF can increase planners' confidence in providing alternatives to farmers. Additionally, the ACPF can be used in the pre-planning process and can be used as a training tool for new or inexperienced staff.

“A farmer comes in and says, ‘I want this’ and some of our employees with little experience aren't technically strong enough to say, ‘Have you thought about something else?’ They want to please the farmer because the farmer asked for it. They're not technically strong enough to say, ‘There are other options you ought to think about.’ ... if a planner sat down and used [the ACPF] before they met with the farmer on their farm, they'd have a suite of ideas of what the potential is when they're walking onto the farm. This may accelerate the learning curve and give them a lot of confidence when they're talking to the farmer.” Current state

The ACPF is a holistic tool that can complement NRCS processes and programs while adding a layer of scientific validity to conservation planning. The NRCS is centered on helping people help the land by providing resources to farmers and landowners to aid in adopting conservation practices. At its core, the mission of the NRCS relies on the relationship between field staff and farmers. The ACPF can add credibility to conservation planner recommendations and identifies conservation opportunities through a menu of options while still acknowledging the needs of the farmer to participate in a global agricultural economy.

“The relationship the farmer has with the conservation planner and their credibility is critical. In this scenario, when you're going out to the farm and you say, ‘I think this particular area's a critical point for you to address,’ if I had a map done by a scientific tool that came up with the same conclusion, that gives me much more credibility. I think it really would help in that area, basically convincing the farmer that there is a resource issue at this point that they need to address.” Novel state

There may be some hesitancy to adopt highly technological approaches to conservation planning due to the lack of familiarity some farmers have towards geospatial information use, or the perception of privacy issues regarding their land.

*“Honestly, I see that as a potential problem. I don't know how well received [it will be] because that does two things. One, it's a little bit too Big Brother, and two, they're automatically on defensive because they think they've done something wrong...I have some big-time tech farmers who won't have heartburn with it, but the average farmer, [this type of] technology isn't necessarily something they are that comfortable with. If folks are going to use this type of technology, they've got to be careful not to tip their hand that they know this much already when they're going to go talk with folks.”
Current state*

To address this, messaging could include that the use of this tool is among a suite of tools to get to know the landscape to assess impairments more accurately within the larger context of the landscape. Although ACPF utilizes geospatial information, there are other tools in the NRCS toolbox that explore land use of the farmer. Language use is key. So words such as “targeting,” or “targeted conservation,” may need to be avoided. Rather, verbiage such as “geospatial assessment” may be accepted.

2.2.2 ACPF Ability to Address Existing Challenges

Several critical gaps can create difficulties for carrying out the conservation planning process. The NRCS is aware of many critical gaps and is working to address them through hiring, entry-level training, and exploring the adoption of ACPF. Not only this, but the NRCS is providing opportunities for experiential learning where staff can engage in critical thinking when presented with challenges on the landscape and in working with farmers. These are key opportunities where ACPF can address these challenges and aid the organization in meeting its mission area on multiple scales as noted in the messaging section below.

Time and Effort Efficiency

The ACPF enables more rapid assessment as part of the conservation planning process by reducing data gathering time and analysis for potential practices that could be implemented on the agricultural landscape. By complementing the Nine-Step Conservation Planning Process, the ACPF enables more time to be focused on goal setting with farmers and with areawide communities to address conservation impairments. The datasets, processes, and outputs the ACPF uses and produces are acknowledged to have high value among NRCS staff, particularly towards identifying potential problems in the landscape, inventorying resources, and formulating alternatives for farmers.

“My sincere hope is it will allow more time for the field to do what our agency does best, and that's providing that technical assistance that should be done supported by our financial assistance programs. As long as our new staff understands what those tools are doing and what the outputs of those tools mean, I think there would be a very significant asset to our planning efforts in the future or allowing more time for planning, and maybe even directing where some of our planning needs to be focused.” Current state

“I think the ACPF is going to assist us. One, identify problems and opportunities and step four, which is to analyze resource data. Step seven, make decisions, and then also step eight is to implement the plan. Step nine is to evaluate the plan. I think that's where ACPF is going to work.” Novel state

Holistic Planning at a Watershed-Level

Because the ACPF is predicated on specific water quality goals to determine map outputs, this enables goals to be set at multiple levels. Rather than considering the land on a field-by-field basis, ACPF enables users to think on a watershed scale and be a part of a community that is seeking to reach conservation goals. This reframes conservation planning to be less focused on individual fields and brings the focus on meeting community-wide goals.

“[ACPF is] probably more of an area or a program management tool. For example, every year, we have several applications or interested watersheds that want to apply to be in NWQI priority areas. And so, I think it would be helpful for us if we could use [ACPF] to be able, in our ranking process, decide who would be best-funded, where can we get the most conservation for our dollars spent.” Novel state

Prioritize a Dialogue with Producers

By spending less time gathering data and conducting a data-driven evaluation of the land, NRCS staff can prioritize field visits with the farmer to discuss conservation opportunities and alternatives for their fields. With ACPF seamlessly integrating into ArcGIS online and CD, NRCS staff can show an entire view of the landscape with the farmer and conduct an iterative process of customizing ACPF output maps to fit what works best for the landscape and farmer's preferences and priorities. The ACPF provides additional visual aids so farmers can see their fields with the potential practices sited by the ACPF.

"Just an old school kind of technique, but I always to try to leave the farmer with a map of the farm. If I make a copy that shows the ACPF data for their farm, that continues to speak to that farmer long after I'm gone. I used to farm, so I have ridden in tractors for hours, and you like to have something to think about, or if you're in that backfield and, 'I remember when [NRCS staff] was telling me about that,' and so the wheels start turning" Current state

"Farmers like maps. If we've got a cool map that we can show, that gets our foot in the door to start building that relationship. One of the things we struggle with the new organizational structure is we've got soil cons that now are now covering four counties. So the opportunity for them to build relationships with farmers is going to be harder. It's going to be easier for the DCs to build relationships since they only have one county to cover. If we've got younger soil cons with cool technology and maps, I think that would open some doors." Current state

Enhanced Outreach

The ACPF can enhance outreach opportunities by allowing more direct outreach to farmers within a service area. This could include informational letters, public meetings, and partner outreach to farmers.

"ACPF would allow us to say this part of the county is where all of our drainage water management would apply. Let's hold the training there. Let's invite those farmers and make sure we have another event for the other farmers for another conservation topic, but let's target our efforts on these farmers where it's going to apply best and be the most effective." Current state

"You can combine it with dollars where you're emphasizing practices and overlay the maps in GIS for the field office. They can then locate the farmers who are located on that property, send them individual letters, make personal phone calls, go out and talk to them, walk the site to see, maybe there's already something there, and then verify and then see if they would want to do something. You can see how this can just spearhead into really taking the money we're getting from DC and putting it on the ground, right to where it's needed." Current state

Staff Training Tool

The ACPF could also be used as a training resource for staff new to the agency or experienced staff working in an unfamiliar landscape. NRCS staff and partners working may consider using ACPF during the orientation and training process to help familiarize individuals with a new landscape. Staff could pick locations to trial the use of the maps and compare map outputs to what the landscape shows when surveying the field. Decreasing the learning curve with new staff members expedite services offered to farmers. If comprehensive training resources (i.e., area-wide conservation planning courses) include ACPF, it could enable greater success in planning and implementation of products and services offered to farmers.

“[ACPF] could allow a better knowledge transfer from one generation to the next. I can go look and pretty well read the landscape and tell you about soils and everything else, but if I've got my junior soil conservationist with me, and she's out there trying to do conservation planning with ACPF too, that gives her tremendous background knowledge to be able to work with farmers on things she's never been exposed to.” Current state

2.2.3 Additional Opportunities for ACPF with the NRCS and Partner Organizations

Scalable Planning: Area-wide to Field Scale Conservation Planning

The ACPF is an area-wide planning tool that can be applied at both watershed and field scales to address a variety of watershed goals. At an area-wide scale, ACPF can be used by state NRCS offices and conservation partners to guide priority watershed efforts, or by several county offices to direct conservation planning efforts. At the field scale, ACPF can provide information to NRCS staff, conservation partners, and farmers or landowners to guide the development of a conservation plan or to facilitate a multiple landowner project.

Enhanced Outreach

The ACPF enables NRCS staff and conservation partners to assess and target specific areas where financial availability, priority practices, and ACPF output maps could be overlaid to guide outreach to farmers within specific areas.

Financial Justification for Programs and Approaches

Access to area-wide data in priority areas and conservation recommendations through ACPF outputs provides financial justification for federal programs. ACPF outputs can also justify for additional funding to supplement funding for NRCS programs.

2.3 Communication Channels for ACPF

Multiple communication channels will be available and hosted through the National Hub to deliver resources as well as facilitate a conversation around research advancements and the use of ACPF within multiple contexts.

Website

The National Hub will establish a website that serves as an informational center for the toolbox and its use. Users who visit the website will receive an introduction to the ACPF and user manuals, can sign up for online and in-person training, and access pages to download ACPF datasets. The website will also host a resource library for researchers and practitioners to access information and advancements made on ACPF to support their professional activities.

Annual Research Meeting

The National Hub will coordinate an annual update meeting with a network of scientists working on advancing the tool, and studying the socioeconomic impacts of the ACPF. This can provide multidisciplinary connections for researchers working with ACPF and targeted conservation strategies as a whole.

Annual Meetings with Key NRCS Leadership

The National Hub will conduct annual meetings with key NRCS leaders at the national level to discuss the progress of federally funded ACPF work, demonstrate successes of ACPF adoption, and further its use in developing conservation goals, federal appropriation, and conservation implementation across the US.

Training Workshops

Regular training opportunities and workshops will be offered through the National Hub to train individuals in the technical use as well as map output use of the ACPF toolbox. Programming will be available to NRCS staff as well as supporting conservation partners.

Publications

The National Hub will actively seek opportunities to publish success stories, case studies, and other information regarding the ACPF in popular press publications to encourage awareness of the benefits of using the tool for conservation planning efforts.

State Specific Public and Internal Communications

The National Hub will work with state communications offices to develop internal and external communications regarding ACPF use within the state. External communications include public updates available on the NRCS website, partner websites, and the agricultural media regarding the availability of ACPF to develop conservation plans. Internal communication within the NRCS related to ACPF adoption includes memos, support messaging, as well as training and workshop announcements to NRCS field staff to raise awareness of ACPF and encourage use among NRCS staff and conservation partners.

3. Insight on ACPF Use

Informed by interviews and surveys conducted as part of the first agreement (USDA-ARS agreement 59-5030-9-006), this section highlights enabling and hindering elements related to ACPF use by NRCS and conservation partners, guides ACPF messaging and communication related to raising awareness of ACPF and its contributions to conservation planning.

The elements discussed below can either support ACPF use in NRCS's conservation planning workflow or create challenges that can limit ACPF's use by NRCS and conservation partners. Enabling elements include full support from NRCS staff throughout the agency structure, as well as support from a broad network of conservation partners. Hindering elements include bureaucratic, conservation planning, technical, and staffing-related challenges.

3.1 Enabling Elements

Enabling elements include top-down and bottom-up support from NRCS staff and management, endorsement from NRCS specialized staff (conservation planning, programming, and GIS staff) and demand from public and private conservation partners.

NRCS Support

While the hierarchical organizational structure of USDA and NRCS provides key elements of support that enable ACPF use throughout the agency, bottom-up support from field office staff is another key element that enables the adoption of ACPF. Top-down support from national and state offices can play an important role in promoting ACPF use, while bottom-up support from field and area office staff can be key to the effective implementation of ACPF. Field- and area-office staff are key intended end-users of the tool and are essential to integrating ACPF into the NRCS conservation planning workflow. Communicating benefits of ACPF is key to NRCS staff support at all levels.

Top-Down Support from National and State Office Staff

Support from USDA, NRCS national office, and NRCS state offices play a key role in the adoption of ACPF. At the USDA level, FPAC has an influential role in NRCS' daily operation and plays an important role in enabling ACPF's integration into NRCS. To secure support, FPAC needs to be aware of the efficiencies ACPF can provide the agency and its contribution towards achieving national conservation goals.

"We have the FPAC [business center] who handles business decisions, administrative stuff, and all the personnel. They control a lot of what NRCS and other agencies do at this point. Adoption probably needs to occur within NRCS at the national level, but [FPAC] is not fully up to speed. They will have to sell it to the FPAC because they control the business and management side of things that come into NRCS. You [need to] sell them on efficiency, how [ACPF] is going to help in the long run on certain things for planning. Those keywords would probably help sell it...efficiency, efficiency." Current state

“...even though ACPF has been out for a number of years, I think we need to do a better job of sort of teaching leadership what this thing really is... They [leadership] like to say, ‘Well, how much time is this going to save us?’ Or, ‘What does this really mean?’...we just have to do a really good job of explaining it so that they can get behind it and make it a priority for our field staff to be using [the ACPF]. We’re not at that point yet.” Current state

Securing support from National, Regional, and State office staff can be another key step to ACPF adoption and use throughout the agency. These offices include decision-makers whose endorsement of ACPF can authorize its use. Similar to USDA leadership, understanding the benefit ACPF provides, specifically efficiencies for field office staff, is important to securing their support. With the endorsement of national and state offices, area and field office staff can use ACPF in their daily conservation planning activities.

“If you find the right person at headquarters who can promote [the ACPF] and be the leader or Champion...They sell the program to the state conservationists who sell it to us, line-in- staff people, and then we sell it to the field. And that’s the way it works. So if we wanted to really be successful, that’s the route you’d have to take. Otherwise, it’s always going to be kind of in the back corner, used by certain people to try to get certain things done.” Current state

“If leadership takes a stance that this is something that we really want to do and we can sell it to where it’s going to create efficiencies and assist [field office staff] in getting [their] job done and serving customers better, then that’s the first step.” Current state

In state offices, State Conservationists and State Resources Conservationists are particularly important to ACPF dissemination. State Conservationists work closely with the National office to address their state’s needs and can communicate their state’s interest in ACPF. State Resources Conservationists also play a critical role in ACPF adoption, as they manage the day-to-day operations and are key to incorporating ACPF into each state’s conservation planning process.

“At each state level, the state conservationist, for sure. If the states had a need, national headquarters hears that message loud and clear, then they do what they can to facilitate addressing the state’s needs. So at the state level, definitely the state conservationist, [state resource conservationists], and folks that oversee and supervise the GIS expertise in the state.” Current state

“The state conservationist runs the show. They’re the ones that make all the hard decisions and that people look to set a direction. The state resource conservationist is responsible for the implementation of the planning process. So they’re the ones that would decide if a tool is valuable for us to use.” Novel state

Bottom-Up Support from Field Office Staff

Adoption of tools or technology is more efficient if supported by the end-user, and ACPF is no different. While ACPF has applications for conservation planning at both watershed and field scales, field- and area-office staff will be a key end-user of the ACPF as it is applied to field-scale conservation efforts. Although NRCS directives come from a clear line of command, without area and field office support for the ACPF and an understanding of how it contributes to conservation goals and workflow, adoption of the tool can be stalled or limited. Additionally, field office staff are the public face of the agency and are tasked with working with farmers and landowners to implement conservation planning activities on the landscape. Due to their relationship with farmers and landowners in their area, field office staff play a key role in communicating ACPF results in their field office.

“Key positions are conservation planners, soil conservationists and resource conservationists at the field level. If you had their buy-in across the state, there would be nothing stopping the tool from being adopted. I can suggest it until I’m blue in the face, but if the field office planner don’t see usefulness in that tool, it won’t catch any momentum.” Current state

“The field office folks could implement it the best because they’re the one-on-one people, the face of the agency... It would have to be coordinated with state people, communication people, and PR folks for sure. But as far as implementing it, it would have to be the team members at the field office.” Current state

Similar to a “Champion” in the national office, well-respected field and area office staff can play an influential role in supporting the adoption of the ACPF in local field offices. To achieve ACPF buy-in, field and area office staff need to understand the benefits and efficiencies ACPF can provide to their day-to-day planning activities.

“Acceptance of the tool it comes from word of mouth at the area office level. If we can [show some] well-respected conservation planners or area resource conservationists the tool, show the efficiencies and usefulness of it, then let them go ahead and spread the word, I think that’s how we would probably try and get it adopted” Current state

“There’s got to be value for our planners. They have to recognize the value in something before they’re going to grasp it and accept it and utilize it. So if we can show that it’s going to produce a product that’s going to help them do their job, I don’t think we’re going to see much resistance.” Current state

NRCS Program and Planning Staff

Support from NRCS program and planning staff will also be essential to address ACPF's watershed-scale applications. Housed in the state office and managed by the State Resource Conservationists, NRCS program and planning staff work on state or area-wide landscape and watershed-scale programs (i.e., RCPP, NWQI, GLRI, MRBI). Programming and planning staff can play a key role in ACPF adoption by promoting the benefits of using ACPF in these initiatives.

"I like the fact that it [watershed planning] is now required before we can come in with funding for those two initiatives [NWQI and MRBI] to put things on the ground. Using ACPF as part of putting that plan together...I think that's a good thing. And maybe as an agency, there'll be more of that. It's just either having the staff to write those plans and know the ACPF component of it or the funding to be able to do partnership agreements." Current state

"...I would say just the structure right now of...getting a new watershed funded [under programs such as NWQI and MRBI]. I think just that structure...where we have to develop a watershed assessment and then use that to request funding, I think that structure leads us to need programs like this [the ACPF]" Novel state

Partner Support

Integrating ACPF into the NRCS workflow requires support from conservation partners in public and private sectors at national, regional, state, and local scales. Public sector support from state and federal partners, such as the Environmental Protection Agency (EPA) or state water quality agencies, can enable ACPF's use through the agency and contribute to shared conservation goals. NRCS also values their relationships with private partners and rely on them for many important aspects of conservation planning and delivery. The desire to use the ACPF can be shared with NRCS via State Advisory and Technical Committees. While each state's committees have their own operating procedures, these committees include public and private partners within each state who provide NRCS comments and recommendations on state natural resources, water quality, and conservation goals within the state. Support from both public and private partners can promote the use of ACPF by communicating their desire to use the tool and can bolster its utility by providing vital conservation planning support.

"The EPA's 319 program [is] delivered by the [state environmental agency]. They do watershed planning and when those folks see ACPF, they're like, 'Holy cow. We need this,' because of what they do. They get excited. It's not the total answer but it's a definitely a much more efficient process than what they currently have available. So, the EPA and state environmental agencies also need to see these products and be part of this conversation on how do we get more of this across the nation." Current state

"[ACPF responds to] demand from partners that are wanting to do [watershed] planning but need the technical support. So, if there are success stories out there of how [ACPF] has helped others see that and say, 'We want this in our watershed or our county so we can use your dollars effectively', motivate a state conservationist through a State Technical Committee..." Current state

3.2 Hinderling Elements

The ACPF faces many hurdles to adoption that can limit its use by NRCS and conservation partners. These hurdles are related to bureaucratic, program-driven conservation planning, as well as technical and staffing challenges. Bureaucratic challenges include issues related to support from congress, USDA, and NRCS leadership. Program-driven conservation challenges include issues related to drivers of conservation planning activities. Technical challenges include data availability, ACPF's compatibility with existing conservation planning infrastructure (i.e. CD/CART), and ACPF's application outside of the upper Midwest. Staffing challenges include time and resources needed to run the ACPF, training required to use the ACPF, change fatigue, and status quo bias.

Bureaucratic Challenges

While NRCS' agency structure can be an enabling element, governmental challenges related to congressional appropriations can also create hurdles for ACPF adoption. Congress plays a foundational role in ACPF adoption, as they support NRCS conservation planning efforts by funding federal programs and related conservation through the Farm Bill. Similarly, USDA, FPAC specifically, has control over foundational aspects of NRCS that will be necessary to enable ACPF use throughout the agency. Without the support of Congress, USDA, and FPAC the ACPF will face significant hurdles.

“If the agency at the national level is supportive of the use of a tool like this, that certainly helps facilitate the adoption and use within the states. But...it takes capacity of half and technology in order to use a tool like this. So, I think there's multiple layers of acceptance and support of tools like this that need to take place...if it's not highly suggested [by the NRCS leadership] it probably won't get used.” Current state

“...[FPAC] handles all the administrative stuff. They handle all the dollars. They handle all the personnel. They handle hiring. IT is its own branch, but IT is kind of under them as well, sort of. So, IT controls a lot of the tech, a lot of the computer equipment, a lot of the software, a lot of the security things, a lot of the network...and those things are all significant...we are constantly trying to work around constraints that they put on us in the name of security, but sometimes it's a little too much.” Current state

“But one way [to promote ACPF is], if we had the ability to say, ‘You're only eligible for the program if you have a conservation plan that's been prior prepared.’ But Congress won't let us do that. The program rules, the Farm Bill rules, the political pressures, the infrastructure prevent us from taking that hard and fast stance, at least in my opinion...So the other option is to find tools that make the development of the conservation plan, in terms of the resource inventory and preparation of the documents and the technical information, to make that easier and quicker and more automated so that doesn't require as much time at the field office level. And so that's the approach that I think the agency...is trying to take.” Current state

Program-Driven Conservation Challenges

Program-driven conservation planning is an approach to conservation planning that prioritizes spending program dollars and compromises the integrity of NRCS' nine-step conservation planning process. Program-driven conservation planning can occur as field-office staff are pressured to spend allocated funding and meet contract deadlines related to Farm Bill programs administered through NRCS (i.e., EQIP, CSP, CRP). In an ideal scenario, a conservation plan is developed with a farmer to identify field-scale resource concerns which informs practice and program eligibility based on the conservation plan. Program-driven conservation planning undermines the conservation planning process and can result in the inefficient use of program funds and limits practice impacts on resource concerns and overall conservation goals. ACPF is designed to support NRCS conservation planning process and the continuation of program-driven conservation can jeopardize how ACPF results are applied to the landscape.

"I think that we're so focused on getting the money out that, a lot of times, it takes priority over everything else, and it has affected the quality of our conservation planning because we have way more applications, and we haven't had the staffing level that we need." Novel state

"When I came to the state nearly five years ago, I wanted to focus on conservation planning like it's supposed to be done, conservation planning prior to contracting. And many times, we get so busy that we don't get all of our planning done. It's the quality of planning upfront that we need to do in order to have successful contracts with our farmers with the Farm Bill programs. And planning is the way to having success in contracts... We're great at what we do, but I still think it [programming] gets ahead of planning, and that's our biggest downfall" Current state

"Ideally, it [program delivery] starts with the conservation plan, you plan a year ahead of the sign up for the program, but that seldom happens. But ideally, you do the conservation plan. Then at the point [you're going to install] the practice, then you sign up for the cost-share for the program and you develop a contract with the dollars and the timetable and all that, farmer signs, NRCS obligates the dollars. Then the practice goes in based on the schedule of the contract which is based on the conservation plan. When we announce we're accepting sign-ups for cover crops or grass waterway, and a guy walks through the door and says, 'I want to do [cover crops] in my field this year.' sometimes the window for doing that practice is weeks away. So our guys hustle and get a contract put together and develop a plan to fit the contract, to be honest." Current state

"So a lot, the vast majority of our conservation planning is to support Farm Bill programs. And unfortunately, we've grown so fast in our obligations over the last 10 to 12 years that most of our planning effort is in support of applications for contracts, which is not really the way that Hugh Hammond Bennett designed in the Nine Steps of Conservation Planning." Current state

Technical Challenges

ACPF also faces a variety of technical challenges related to the availability of data needed to run the tool, the tool's ability to be applied to landscapes outside of the upper Midwest, and ACPF's compatibility with other decision support tools and NRCS existing conservation planning infrastructure (i.e., CD, CART)

Data availability

ACPF depends on hydro-conditioned LiDAR data as a foundational component to the output maps it creates. This creates two challenges related to data availability. The first challenge is access to up-to-date LiDAR data, and the second is hydro-conditioning the LiDAR data. While some areas have access to LiDAR data, others do not. When LiDAR data is available it must be hydro-conditioned to account for surface water flow. The process of hydro-conditioning LiDAR data it requires time and expertise.

“Are we going to get LiDAR flown every year? Doubtful. Especially in these Delta regions where you've got the heaviest amount of farming going on, how often are you going to get that LiDAR data?” Novel state

“You've got this high-resolution LiDAR, but one of the things is that it doesn't see culverts. You've got to condition that DEM and digitizing the culverts to get the water running right. It's a big deal so getting that hydro-conditioned DEM correct is pretty critical. That's a huge obstacle for anybody to turnout ACPF [outputs].” Current state

Compatibility with Conservation Planning Infrastructure (CD/CART)

To streamline the conservation planning process, it is important to integrate ACPF into the existing conservation planning infrastructure of NRCS (CD/CART). While ACPF provides valuable information that can improve conservation planning efforts, if ACPF outputs are not readily available to planning staff the information can be underutilized and can ultimately jeopardize its use. Integrating the ACPF into existing planning infrastructure enables planning staff to have easy access to ACPF outputs and optimize its impact to conservation efforts.

“What I don't understand is how that's going to interface with what we're doing with CD and CART and some new tools that our agency's coming out [with]-- I know the agreement is a national agreement, so there's cooperation, but I don't know how that's going to interface with each other.” Current state

“If it's determined to be valuable to the agency as a whole, having it built into CD or CART as an option to run [ACPF] within our normal planning and assessment and ranking process, I think would be very valuable.” Current state

“Output layers are not very big. So I think standardizing them all and having the ability to publish them so a conservation planner using CD could stream that information and drop it on top of the fields that they're working on...The whole idea of publishing the outputs to a cloud service that streams it for consumption that way. There's a lot of different ways that you can consume that information once it's available.” Current state

Application Outside Upper Midwest

While the ACPF has seen success across the Midwest, expanding its applicability to areas beyond the cropland-dominated upper Midwest may face challenges. As ACPF works to broaden its geographic scope it needs to account for diversity in landscape characteristics, resources concerns, and practice preferences.

"[The ACPF] is really geared toward cropland and what takes place on cropland acres. We're a state that's two-thirds grassland and forest and I would like to find ways the [ACPF] can be utilized in those types of areas as well. Everything we've talked about - being able to use it at local level and all that - is fine if it's cropland, but a lot of our districts work in predominant grassland land uses. For the long-term [it needs to] better fit our landscape rather than just the Midwest" Novel state

"There wasn't a vast number of practices I recall were applicable here. I mean, filter strips, field borders, those types of things would be relevant to [our state]. Some of the other practices like bio-reactors, was something that was used. We do have tiled fields in [our state]. And the way that ACPF would account for that would be applicable to [our state] as well, just those practices associated with that. I don't know they're being widely adopted within the state right now, such as drainage water management and things like that." Current state

Staffing Challenges

Staff Time and Resources Required to Run the Tool

Acknowledging the time and expertise required to produce ACPF outputs, there is a concern that not enough NRCS staff with the required expertise, technical resources, and available time to create outputs for use at the area or field offices.

"It would be more than a full-time job just to do ACPF, and just to keep running it and make watersheds. And it's not just a matter of automating a process and spitting out the answers for the whole state. I mean, we could do that. But we're not really capturing the identity of each watershed when we do that. Each watershed is a little bit unique. ACPF has to be tuned to each watershed. So that ACPF tuning to the watershed, achieving coverage, I think those are big challenges to fully successful implementation for all planners. It's going to work where we can provide it. It's going to help where we can provide it. And we're just not going to get full coverage anytime soon. I think that's one of the challenges with it, one of the limiting factors with it right now." Current state

"Having said all that, it's all kind of dream work. We can do those kinds of things on a limited basis maybe for a farmer here and there. But we don't have the skill in the agency. We don't have the coding skills. We don't have the coding infrastructure. We don't have the computing power to be able to do that on a large-scale basis. I don't see NRCS developing that kind of skill any time soon." Current state

ACPF Training

ACPF will require two specific types of training for successful dissemination throughout the NRCS: technical training, and results delivery training. The technical training would be administered to specialized NRCS staff and partners tasked with running ACPF toolbox and creating output maps for select watersheds. Results delivery training would be provided to NRCS staff and partners using ACPF output maps to inform conservation planning. Acknowledging the importance of training as well as time and resource constraints on NRCS staff, it will be important to provide quick and efficient ACPF training to NRCS and partners using ACPF.

“Just giving people a tool without actually walking them through how to use it. That happens a lot. Where this thing comes down, we don't have adequate training, [but] we're supposed to use it. Some people who are really motivated and interested use it but for everybody else, it's one more thing on their plate and it doesn't get adopted.” Novel state

“I think ease of use seems like it's going to be an obstacle to the county level. They're already really busy, so if it's something that is going to be difficult for them to learn, then that's going to definitely be a hindrance on how successful it is.” Novel state

Change Fatigue and Status Quo Bias

Another challenge facing ACPF adoption is a hesitance to adopt new tools due to change fatigue at the area and field office level and status-quo bias at the state and national level of NRCS. In recent years NRCS staff have had to manage a variety of anticipated changes, such as new Farm Bill programming, as well as unanticipated changes, such as the introduction of new operating and ranking systems (i.e., CD, CART) and agency reorganization in some states. While change is inherent to the organization, multiple updates occurring within a short timeframe can hinder workflow and staff capacity.

“...we're slamming our field office with a lot of new stuff [right now]. So, we're going to have to do Farm Bill programs and all of them have changed some way. We're giving them a new operating system. We're going to have a new ranking tool...we're reorganizing, there's some other things that are coming on the stateside that are new. We're layering a lot of stuff on our folks all at once, and my fear is...it's [the ACPF] going to be just one more thing on the layer as far as how people view it. So, if we're going to provide it to our folks, we need to be able to package it in a way that...it doesn't feel like one more thing. It's something that incorporates what we're doing on a daily basis. So, the way it's introduced to the field is key.” Current state

“I can tell you what's hindered [ACPF adoption] in the past. And that's just that decision makers are so unbelievably busy, it's just hard for them to see it...just with everything else they [the leadership team] have going on it was just too much, too many things happening. And I think that's kind of a barrier. But frankly, if that got fixed at the national level, it would not be much of an issue here.” Current state

“As an agency, people say they're open to change. My feeling is, especially with having just gone through it with GPS software, we had something that did what we needed and honestly, I think it was more convenient for people to say no than to put any effort into trying to figure it out. It's just easier for them to say no. And that all goes on at a level way above me. All I can do is send the request up, but it makes it easy for people at a higher level to say no when they're just not dealing with the people that are directly asking, so.” Current state

“Our demographic is changing rapidly because we've got a lot of retirees, and we're bringing on a lot of new people, and I think that situation's improving. I don't want to come across as ageist, because we've got some senior employees that are good at what they do. But we've also got a segment that just, ‘Why change what's always worked?’ And when you get in that role, it can be hard to get out. But that plays back into a huge number of things like staffing numbers.” Current state

The NRCS is aware of these critical gaps and is working to address them through hiring, entry-level training, and exploring the adoption of ACPF. Not only this, but the NRCS is providing opportunities for experiential learning where staff can engage in critical thinking when presented with challenges on the landscape and in working with farmers. These are key opportunities where ACPF can address these challenges and aid the organization in meeting its mission area on multiple scales as noted in the messaging section below.

4. ACPF Training

Currently, three types of training have been developed for the ACPF: a watershed-focused applications of ACPF workshop, an online on-demand technical training, and a cohort-based technical training. In 2021, the watershed applications training and the technical cohort training were adapted to be delivered virtually. Previously, the watershed applications training had been held in-person over two-days with a statewide cohort and the technical training was held in-person over two-to-three-days. While these trainings were moved online due to the pandemic, both were successful in their new format. The technical cohort training received positive feedback from instructors and from engaged participants, who were more confident in their ability to use ACPF after attending. Additionally, a survey of watershed applications training participants showed a minority of respondents would prefer additional in-person training, and most wanted more virtual training opportunities. Each of these trainings supports expanding the use of ACPF throughout the United States.

4.1 Existing Training Resources

Virtual Watershed Applications of ACPF Workshop

This training is designed for NRCS staff, extension professionals, watershed practitioners, county conservation staff, and private consultants who are interested in learning more about using the ACPF to improve their watershed-based planning and implementation projects. No GIS or prior ACPF experience is needed as learners do not run the ACPF toolbox in this workshop, but instead learn how to interpret, display and share ACPF results in the pursuit of watershed planning. GIS specialists who want to learn how to use the ACPF toolbox in ArcGIS, should instead attend one of the technical training options.

The training is designed so individuals working in watershed-based conservation within a state or organization can take the course together. By learning together, they can build their network and capacity, and customize the training to fit the watershed programs, funding, and rules in their context. These individuals form state-based learning cohorts that can discuss the ACPF in the context of their specific conservation planning and implementation policies and tools. Participants can discuss support for ACPF in their state, ACPF compared to other state-based watershed and conservation planning tools, and state-specific examples of ACPF in use.

Virtual Cohort-based Technical Training:

The purpose of this course is to teach users how to download the ACPF toolbox and the base data and run the terrain analysis tools on a sample watershed. By working through the online training as a group, learners have the opportunity to become part of a community of users, get feedback and troubleshoot issues with their peers. The course also provides information on available ACPF support and customization of the ACPF tools for use in watersheds.

The training is designed for NRCS field staff, NRCS state staff, watershed planners and implementation staff, county and soil and water conservation district staff, and private consultants who are interested in learning how to download the ACPF toolbox and the base data and run the practice siting tools on their chosen watershed. This training is designed for individuals who have an intermediate knowledge of GIS, since it assumes viewers are comfortable navigating toolboxes, using tool dialogs, manipulating map characteristics, and moving and joining tables.

The technical cohort training takes place over 6 weeks. In addition to going through the asynchronous online technical training, learners attend weekly virtual course check-ins with instructors to troubleshoot issues, talk with others in the course, and review the ACPF supports available. In addition to the weekly virtual check-ins, instructors and other ACPF experts hosted a series of virtual webinars on various topics related to the ACPF tools. These meetings, along with individual work over a 6-week time period allows attendees the time to run the ACPF on a sample watershed while checking in with instructors along the way.

4.2 Training Recommendations

After conducting these updated trainings in 2021 and analyzing evaluation data, we have the following ACPF training recommendations:

- Continue offering Virtual Watershed Applications of ACPF Workshop and Technical Cohort Training for NRCS staff and conservation partners. The technical cohort training is key for ensuring individuals know how to effectively run and interpret the ACPF for their watershed. The watershed applications training is critical for putting the ACPF outputs into a broader context and ensuring it can be leveraged to create change on-the-ground. Both resources build awareness about the ACPF with a broad range of individuals which in turn creates ongoing interest in the technical training.
- Ensure future trainings include contextual information on what the ACPF is, how it can be used at a field and area-wide level, and how it relates to existing NRCS and state-level planning tools. This includes providing information on how ACPF fits into the 9-steps of conservation planning by using infographics to portray the different ways ACPF can fit into conservation planning. This recommendation aligns with readiness team survey results showing only 17% of NRCS staff and partners are familiar with the ACPF and underscores the importance of providing information on what the ACPF is, and the value it provides.
- Ensure leadership buy-in for NRCS staff utilization of the ACPF. Leadership buy-in is critical to ensuring county-level field staff can incorporate ACPF into their work. This recommendation aligns with readiness team results that notes ACPF endorsement needs to occur in NRCS from leadership including the Farm Production and Conservation Business Center, NRCS headquarters, and state leadership to facilitate broad ACPF adoption.
- Continue engaging state-based NRCS partners including SWCD, Extension, NGO, and state agency staff in the ACPF conversation through state-based learning cohorts to ensure NRCS staff are supported in their use of ACPF.
- Ensure trainings include proper information about the types of landscapes and the types of practices ACPF is best suited to address. This includes information about the conservation practices commonly used in Iowa where the ACPF was developed and how ACPF results can be interpreted in landscapes outside of the Midwest.
- Ensure ACPF training is updated as new tools and updates are available.

5. Next Steps

5.1 Build a Coalition for Change

To enable sustained adoption and use of ACPF throughout the agency, support from key change agents at all levels of the agency is needed to create a coalition for change. Key change agents are individuals who provide expertise, energy, and perspective that help guide leadership and staff towards support, acceptance, and sustained application of ACPF. An effective coalition for change requires buy-in from participants with diverse skill sets (i.e., GIS, watershed planning, field-scale planning) from both top-down (FPAC, USDA, State office), and bottom-up (i.e., field office, area office) across each level of the agency who set an example and promote behaviors that support ACPF adoption and use. Key change agents include USDA leadership and FPAC, NRCS National and State Office leadership, field and area office staff, as well as conservation partners working with NRCS.

USDA Leadership and FPAC

FPAC and USDA support for ACPF is foundational to its adoption by the NRCS as both entities influence NRCS's administration and management operations. Although FPAC is not a direct ACPF user, its policies impact NRCS' daily operations. Their ACPF endorsement is the first step to enabling its use by NRCS in conservation planning activities.

NRCS National and State Office Leadership

The national office provides guidance and directives to state offices, while state offices interpret and apply directives to their state's unique conditions and standards. State office staff, specifically the State Conservationist, State Resources Conservationist influence daily operations of field and area office staff in their state. Their endorsement plays an essential role in ACPF's use throughout the state, as field and area office staff are under their direction.

Field and Area Office Staff

While top-down support plays a key role in ACPF adoption, bottom-up support from field and area office staff (i.e., conservation planners, resource conservationists, soil conservationists) is equally as important. Field and area office staff are the public-facing staff of the agency and can be primary users of ACPF output data. Widespread support and buy-in from this group are crucial to ACPF use in the NRCS conservation planning workflow.

Partners

As an agency, NRCS works with federal, state, and private partners to address shared conservation goals at national, state, and local levels. Due to the collaborative nature of these relationships, partners can be key change agents and play an influential role in promoting the adoption of ACPF. Partners can communicate a need for ACPF products while contributing skills and resources to enable ACPF use. Partner support and recognition of ACPF's conservation planning contributions can demonstrate a need for ACPF to NRCS staff at the national, state, and local level.

5.2 Empower Use

To enable the use of the ACPF, the National Hub and NRCS leadership must empower NRCS staff and conservation partners to use the tool. This can be enabled by providing a streamlined approach to ACPF use that includes integrating ACPF into existing conservation planning infrastructure, providing training opportunities for running ACPF as well as its use and interpretation related to conservation planning, and emphasizing opinion leadership.

Integrate ACPF into Conservation Planning Infrastructure (CD/CART)

Encouraging the adoption of the ACPF should not be promoted as an additional tool, but as a technology that integrates into present technologies, NRCS already has in operation for streamlined use and compatibility with current approaches. NRCS staff uses a variety of data sources to inventory and assess natural resource information for a field or area. Datasets provided must be compatible with NRCS's current conservation planning infrastructure to enable streamlined use, rather than have staff members turn to multiple sources to develop conservation plans. Integrating ACPF into CD and CART enables use by NRCS employees. ACPF outputs must also be accessible through downloads via the ArcGIS Online system that NRCS currently works within to deliver data to devices NRCS staff and partners use to analyze the office or in the field with a farmer.

Experiential Training and Support

ACPF training requires two learning pathways, one focused on the technical use of the ACPF (i.e., run the toolbox) and another on interpreting ACPF outputs and integrating information into conservation planning activities. Technical training would be offered to a small group of specialized NRCS staff and conservation partners, while training on using ACPF for conservation planning would be offered to a broader audience of field office staff and conservation partners. Both in-person and online training opportunities should be available to accommodate schedules and learning preferences. Case studies examples should be provided as examples of how ACPF has been used by other professionals in conservation planning. Troubleshooting resources will also be offered from the National Hub as issues arise among NRCS staff and conservation partners use ACPF to inform conservation planning activities.

Emphasize Opinion Leadership

Opinion leadership is key to encouraging the adoption of the ACPF within the NRCS. Before promoting ACPF use among field staff, it is critical to first get key opinion leaders involved to endorse the use of ACPF. Promotion of use can be through both informal and formal means. Opinion leaders at NRCS state office (i.e., State Resource Conservationist) and field office staff (i.e., District Conservationists) can issue formal memos and endorsement of the tool, while informal tool endorsement could be through staff leading by example and using the ACPF tool. In doing so, these members could highlight the successes they have had in using the tool to implement conservation practices and increase federal investments into impaired landscapes. NRCS leadership needs to pave the way for easy access of the tool through the above means, as well as provide clarity for how ACPF will be used (i.e., supplemental, optional, or required) as part of the conservation planning process.

5.3 Develop Short-Term Wins

To develop short term wins in the adoption and dissemination of ACPF within the NRCS and with conservation partners, it is key to first focus on increasing both awareness of the ACPF as well as knowledge of how it works, and how it can be applied to conservation planning activities by encouraging enrollment in ACPF training.

Encourage Trainings Enrollment

Both types of training should be widely available and in a way that accommodates NRCS staff schedules and workloads to enable successful signup. NRCS staff time should be allowed for training opportunities, as well a certification of completion should be available as a means of professional development for staff members. Other incentives can be determined on a state-by-state basis as the National Hub works with leadership.

Publish Case Studies and Success Stories

Promoting the successful use of ACPF to NRCS staff, conservation partners, as well as farmers and landowners is important to ACPF's use in conservation planning. Success stories and case studies can be promoted both internally and externally. Internally, case studies can be used as a training resource to demonstrate how ACPF is used in real-world scenarios. Externally, publishing ACPF case studies and success stories in farm journals, magazines, and other media can raise awareness and promote ACPF use to the broader agricultural community. These publicly facing documents can be shared via NRCS websites and NRCS external communications.

5.4 Anchor Changes

To build momentum towards expanded use of ACPF, the National Hub will continue efforts empowering NRCS and conservation partners' use of the tool by generating short-term wins in internal and public media. As momentum builds, the credibility of the tool will grow.

A longer step will be to engrain the use of ACPF within the culture of NRCS and conservation partner organizations. Expanding the vision of ACPF within the agency and capturing the employee efforts in a way that reaches the underlying identity of the organization can have positive impacts on the organizational in the future (7+ years). With National Hub and NRCS leadership sharing ACPF successes and emphasizing it as an important part of conservation planning can help engrain ACPF into conservation planning activities conducted by NRCS and conservation partners. Frequently discussing ACPF impacts on organizational efficiency and effectiveness and connecting the tool to positive impacts on the landscape assist in the process of making the ACPF successful at multiple scales.



