



NOAA FISHERIES

The FIS Mission

We work collaboratively through partnerships to improve access to comprehensive, high-quality, timely fisheries information by investing in three broad areas:

- *Data gaps and data quality;*
- *Efficient technology and data integration; and*
- *Effective coordination and communication in the design, collection, and uses of data.*

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Fisheries Information System Program Stakeholder Update

2019 Program Overview

Welcome to the Fisheries Information System Program's Stakeholder Update for 2019. This report details FIS initiatives, activities, and programs from the past year, and outlines future FIS priorities.

REAL-WORLD SOLUTIONS

FIS has continued to focus on providing real-world solutions to the challenges faced in collecting, sharing, and utilizing fisheries-dependent data by federal, regional, and state partners. For instance, the Southeast Fisheries Science Center team responsible for providing data inputs into the Southeast Data, Assessment, and Review process—which conducts stock assessments in NOAA Fisheries' Southeast Region with input from a wide range of stakeholders—worked with the FIS Quality Management and Continuous Improvement Professional Specialty Group to conduct a five-day workshop. Using various QM/CI tools, the team mapped out a more efficient process to provide data inputs to stock assessments, and has begun implementing the improvements.

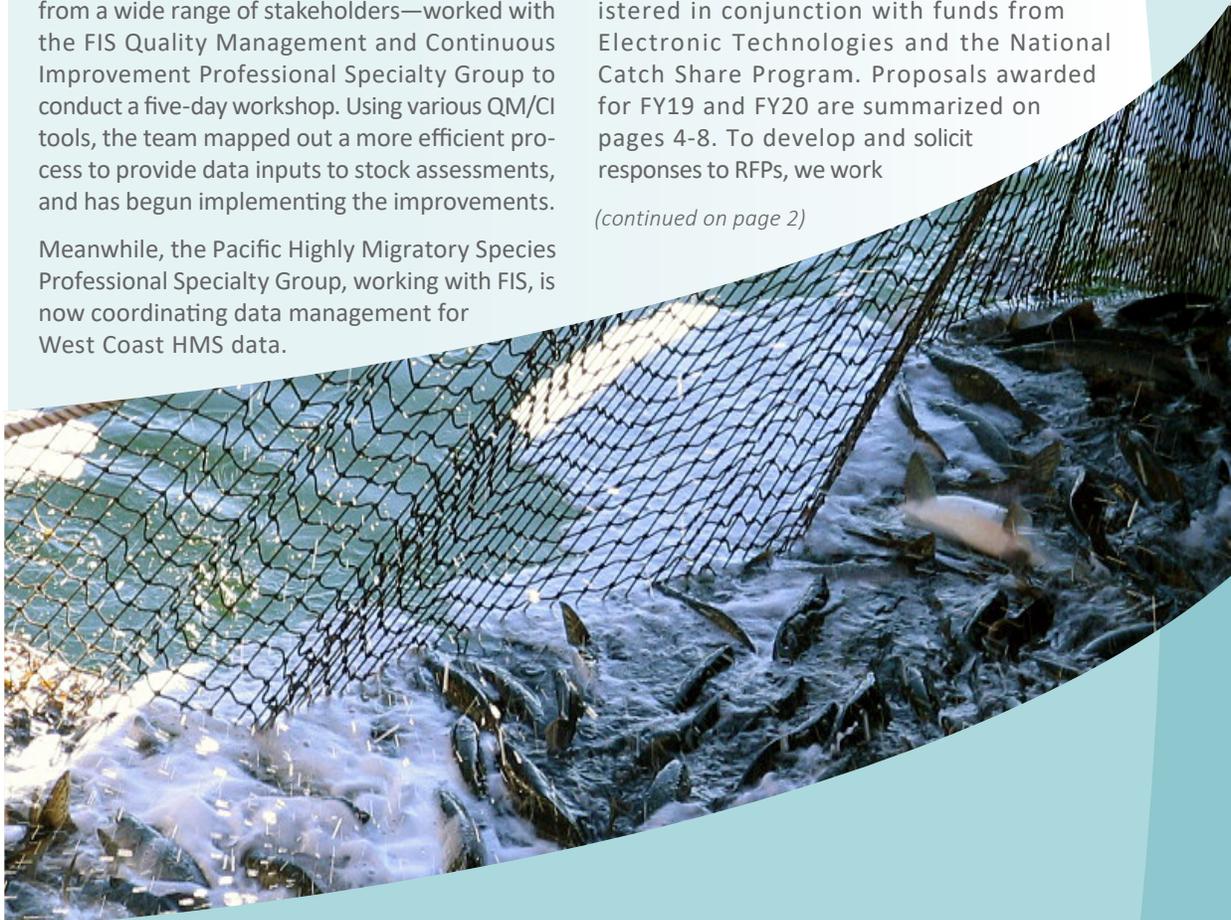
Meanwhile, the Pacific Highly Migratory Species Professional Specialty Group, working with FIS, is now coordinating data management for West Coast HMS data.

The data—which pose a unique set of challenges because of the thousands of miles covered by the species each year over state, regional, and international boundaries—was previously collected and then sent to four different agencies operating independently of one another. The new system has led to efficiencies, cost savings, and improved communication among state, regional, and federal partners. It is also bringing more timely data to fishermen, providing them more predictability in their fishing operations.

FACILITATING COLLABORATION

All of this is made possible through a competitive request for proposals process administered in conjunction with funds from Electronic Technologies and the National Catch Share Program. Proposals awarded for FY19 and FY20 are summarized on pages 4-8. To develop and solicit responses to RFPs, we work

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2019 Program Overview (continued)

closely with leadership from regional offices, science centers, and commissions to identify and prioritize top needs in the areas of:

- Quality Management and Continuous Improvement.
- Data Improvements, Modernization, and Integration.
- Electronic Reporting Pre-implementation and Implementation.
- Electronic Monitoring Pre-implementation and Implementation.
- Fisheries Information Network Development.

The FIS mission is also advanced through the work of our three professional specialty groups: Electronic Technologies, Highly

Migratory Species, and Quality Management and Continuous Improvement. Through annual face-to-face meetings and monthly teleconferences, the PSGs bring together diverse voices representing a range of offices, agencies, and job functions to share project information, discuss lessons learned, and collaborate to solve challenges.

As we look ahead, FIS will continue to focus funding and collaborative efforts on some of the most pressing issues in fisheries data, including data integration, streamlining reporting for industry, and further implementation of electronic technologies. Through these and other initiatives, we will work with our partners to meet our vision of high-quality, timely, comprehensive, and easily accessible fisheries information.

Program Management Team Review and Highlights

The Project Management Team convened for its 2019 annual meeting in Portland, OR in May. In addition to reviewing and providing feedback on FY 2020 RFP pre-proposals and discussing FIS priorities, the meeting featured two Electronic Technologies Center of Expertise presentations and a visit to the Pacific States Marine Fisheries Commission, where PMT members met with staff who demonstrated how they review video collected from fishing vessels using electronic monitoring technologies.

CONTINUED IMPROVEMENT TO RFP PROCESS

For FY 2020, FIS again partnered with Electronic Technologies and the National Catch Share Program to fund fisheries-dependent data projects through a competitive RFP process. The process again included a pre-proposal submission, which provides an opportunity for the PMT to give earlier feedback to project leads and point to any opportunities for collaboration or consolidation.

Looking ahead, the PMT will be focusing on improving the reporting process for funded projects via the Project Information Management System. Utilizing PIMS allows for one platform to be used for RFP submission and project updates, with information on the funded projects accessible to the public.

Strategic Initiatives

The PMT will be focusing on several projects in the upcoming year, as identified at this year’s face-to-face meeting:

- Improving reporting and accountability of FIS-funded projects.
- Continuing support for one-touch reporting initiatives.
- Supporting the establishment of a NOAA machine learning working group.
- Streamlining the proposal submission and evaluation process in the Project Information Management System (PIMS).
- Developing FIS impact metrics.
- Serving as an advisory group for the NOAA Fisheries data modernization workshop.

COMMUNICATIONS AND OUTREACH

The FIS Communications & Education Team continues to focus on sharing successes and lessons learned by FIS-funded projects. Over the past year, several projects have been highlighted through feature stories on the

NOAA Fisheries website. The C&ET also has produced region-by-region fact sheets with information on funded projects, FIS partners, and specific regional impacts.

To support the RFP process, the C&ET also conducted a survey to better understand how project leads learn about the RFP and how FIS can improve the communications surrounding the process. Other C&ET initiatives include work on a comprehensive “onboarding kit” for new PMT and PSG members, and ongoing efforts to refresh and streamline FIS web content on the NOAA Fisheries website.



FIS Case Study: Advancing Innovative Technologies to Modernize Fishery Monitoring

Thanks to recent technological advances in computer processing hardware, machine vision cameras, and open-source software tools, fishery researchers at the Alaska Fisheries Science Center are now taking the next steps in developing electronic monitoring systems and image processing applications that would automate data collection from images captured onboard vessels. Eventually, the goal of real-time image processing is to support scientific data that provide greater certainty in managing ocean resources and sustainable fishing practices.

In 2018, the North Pacific Fishery Management Council and NOAA Fisheries implemented an electronic monitoring program to provide a monitoring alternative for longline vessels, where accommodating an observer can be logistically difficult.

“This program’s integration of electronic monitoring data directly into the catch estimation data stream marked a milestone,” explains Farron Wallace, former senior research fisheries biologist at the Alaska Fisheries Science Center and now director of the Southeast Fisheries Science Center Galveston Laboratory. “However, the systems are not yet able to collect detailed data on individual fish length and weight as an observer does—data that are critical to support stock assessment modeling and catch estimation.”

Additionally, although usable observer data in the North Pacific are either uploaded to a database several times daily via satellite or uploaded at the end of a trip, vessels using electronic monitoring systems store imagery on hard drives, which are then mailed after the trip to video reviewers who process and extract key information. This time-consuming

Fishery researchers at the Alaska Fisheries Science Center are developing electronic monitoring systems and image processing applications to automate data collection from images captured onboard fishing vessels.

procedure can significantly delay data upload, a concern when data timeliness is essential for fisheries management—particularly for those management programs that have prohibited species catch limits, maximum retainable allowances, or other in-season quota restrictions.

To address these challenges, the Alaska Center worked with FIS to find an effective and cost-efficient monitoring solution. Working in close collaboration with industry on system design, operability, and functionality will help ensure that the systems fit seamlessly into fishing operations and vessel configurations, and that the systems are trusted by industry partners to work effectively.

The new systems use cameras that are built for industrial inspection—or analyzing whether products meet specifications—and

can withstand a range of temperatures and mechanical stresses typical in commercial fishing operations. The systems can integrate data from a suite of sensors—including GPS, hydraulic pressure, and drum rotation monitors—to determine set and haul positions and collect effort data. The sensors indicate when a haul back is occurring, which triggers image collection when needed and allows stand-by mode at other times.

“The ‘stereo-camera’ system uses two cameras that pair images, allowing for highly precise measurements—even of flopping fish being hauled onboard,” says Wallace. “Right now we’re working on incorporating the latest developments in artificial intelligence into the systems, including a machine learning algorithm, so they’ll eventually be able to automatically process length measurements and highly accurate species identification for most common species.”

In 2019, these capabilities are being tested in real time onboard fishing vessels to ensure accuracy and full accounting. Ultimately, the systems should reduce the volume of data needed to gather necessary information, improving data transfer rates, storage, and management, both on vessels and on land-based servers.

Capturing fish length through the images could also improve data collection on species that are not usually landed, are too big (such as sleeper sharks), or are too difficult for observers to sample (such as giant grenadier, which easily drop off at the rail). Finally, the systems’ spatial image capabilities could be used to map high bycatch areas and improve future management strategies to lower bycatch.



Stereo cameras deployed on a vessel’s stabilizer pole viewing the hauling station.

Professional Specialty Group Updates

Through our Professional Specialty Groups, the FIS brings together communities of practice, with experts across multiple disciplines representing state and territorial partners, Fisheries Information Networks, Science Centers, Regional Offices, and NOAA Fisheries Headquarters. Within the PSGs, these representatives collaborate on the high-priority needs and challenges faced by federal, regional, and state data programs.

Electronic Technologies PSG

Previously the Electronic Reporting PSG, the Electronic Technologies PSG changed its name in 2018 to reflect the growing role of electronic monitoring and other tools being used in fisheries-dependent data collection and dissemination. Round-robin discussions during the PSG’s monthly meetings help support information-sharing across regions and offices, and aid in the goal of spurring development and improvement of ET solutions. The PSG actively supports the RFP process to find opportunities for collaboration among various ET projects.

The ET PSG also continued to host Center of Expertise presentations via webinar several times throughout the year. These sessions share insights and facilitate conversation among regional offices, science centers, headquarters, and other partners on ET-related issues. These presentations are available on the FIS Bridge site at sites.google.com/a/noaa.gov/nmfs-st-fis-pmt/er-center-of-expertise.

Highly Migratory Species PSG

After its initial convening in 2017, the HMS PSG has focused on building membership, developing administrative documents and processes, and identifying projects that support its mission of creating a comprehensive, integrated Pacific HMS data system that is clear, useful, well-documented, and easily accessible. Working to increase awareness among members of common HMS projects and issues on both the West Coast and in the Pacific Islands, the HMS PSG alternates its leadership and location of face-to-face meetings between those two regions. It also supports two subgroups, the Eastern Pacific Group (EPG) and Pacific Islands Group (PIG).

Looking forward, the PSG will continue to promote coordination and collaboration between HMS data managers and users. Projects for the EPG include integrating data for deep-set buoy gear, while the PIG will work on issues including electronic reporting in the Hawaii longline fishery, and the redesign of the Western Pacific FIN website. The overall PSG plans to move ahead with a communications plan, business rules for comprehensive HMS reporting, and how best to automate reporting for regional fisheries management organizations, along with improving communications surrounding those meetings.

Quality Management and Continuous Improvement PSG

The QM/CI PSG works to promote a culture of continuous improvement and quality not only within FIS, but for all areas of NOAA Fisheries work. Members of the PSG serve as ambassadors within their respective offices on QM practices and tools, whether through presentations, sharing success stories, or leading workshops. To that end, a PSG priority has been to build the knowledge base of members through monthly presentations on specific tools.

Over the last year, the QM/CI PSG has continued to develop its website, www.fisheries.noaa.gov/national/commercial-fishing/quality-management-and-continuous-improvement as a resource for those interested in the various QM tools available. The PSG also works with the PMT on applying QM principles to the RFP process and its assessment. The PSG continues to expand opportunities to provide QM/CI tools to projects receiving FIS funding, and to share out results and lessons learned from RFP-funded projects.

2019 FIS/CSP/ET-Funded Projects

For a complete list of all FIS/CSP/ET funded projects, visit www.fisheries.noaa.gov/data-tools/fis-supported-projects.

Project Name	Description	Support for FIS Vision	Lead Office (Project Principals)
Bridging the Gap; Development to Implementation of Intelligent Monitoring Systems in Alaskan and West Coast Fisheries	Developing intelligent monitoring systems to help address the problem of estimating bycatch in three North Pacific commercial fisheries using EM technology, including supporting data needs while also reducing monitoring costs and improving timeliness for data management use.	Adapts fisheries-dependent data collection systems to new technologies and improving timeliness, cost effectiveness, and data quality.	Alaska Fisheries Science Center (Matt Dunlap, Todd Hay, Farron Wallace)
Continuation of an Integrated Electronic Reporting System that Utilizes the Gulf States Universal Trip Ticket Application	Developing a web-based universal trip ticket application to replace current desktop version, allowing for the coordination of upgrades to the trip ticket reporting system to support the eventual move from paper trip tickets.	Increases accuracy, timeliness, and cost-effectiveness of fisheries-dependent data by aiding the transition from paper tickets to electronic reporting for the Gulf of Mexico region.	Florida Fish and Wildlife Conservation Commission (Chris Bradshaw, Steve Brown)
Unifying Electronic Monitoring and Vessel Trip Reporting (VTR) Collection Systems	Evaluating and leveraging existing EM and VTR software to explore a "proof of concept" system capable of integrating both data collections, in order to ultimately streamline VTR entry and maximize data usability for quota monitoring, compliance, and catch verification.	Increases the accuracy and completeness of fisheries-dependent data, and integrates data from different sources.	Greater Atlantic Regional Fisheries Office (Brant McAfee)

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2019 FIS/CSP/ET-Funded Projects (continued)

Project Name	Description	Support for FIS Vision	Lead Office (Project Principals)
Continued Funding for Dockside Monitoring Program to Support Maximized Retention Electronic Monitoring (MREM) Pilot in the New England Groundfish Fishery	Evaluating the operational feasibility of implementing MREM in the groundfish fishery, which allows participating vessels to retain all allocated groundfish catch and uses EM systems to verify that vessels do not discard allocated groundfish at sea, with the goal of streamlining at-sea catch handling requirements and redistributing catch data collection to the dockside monitoring program, at an expected lesser cost than a fisheries observer.	Improves accuracy, completeness, timeliness, and accessibility of fisheries-dependent data.	GARFO (Claire Fitzgerald)
Cooperative Project on the Validation of Commercial Shrimp Conversion Factors for the U.S. Gulf of Mexico	Conducting a one-year study with Gulf state partners to improve the quality and accuracy of commercial data by collecting and analyzing shrimp samples to validate, verify, and update conversion factors used to determine whole (live) weight of commercial landings from various reported units (such as gutted to whole, bushels to pounds, and units to pounds), allowing commercial landings to be reported accurately in common currency for use in stock assessment and management.	Standardizes and validates conversion factors to facilitate more reliable data for use in stock assessments, state and regional quota monitoring, evaluation of the effectiveness of fishery management plans, and data analysis across different fishery management agencies.	Gulf Fisheries Information Network (Donna Bellais)
Support for Implementing and Administering Industry-Funded Electronic Monitoring in the Atlantic Herring Midwater Trawl Fishery	Supporting the implementation and administration of industry-funded electronic monitoring (IFM) in the Atlantic herring midwater trawl fishery in order to better assess catch and reduce variability around catch estimates.	Demonstrates improvements to fishery management processes, including meeting regulatory requirements, and develops infrastructure and integration for EM programs.	Northeast Fisheries Science Center (Dan Luers, Carrie Nordeen, Nichole Rossi)
Capitalizing on a Groundfish Image Library to Test Automated Image Classification in the Northeast Region	Advancing automated-image classification to enhance the efficiency of still-image and video review by analyzing images collected via the NEFSC-based trawl survey, with the ultimate goal of producing an algorithm that could be integrated into software products that annotate video footage, allowing the expansion of EM to monitor fisheries in the Northeast.	Advances efforts to integrate EM technologies into fisheries and to modernize data collection, management, and dissemination.	NEFSC (Andrew Jones)
Building a Comprehensive Electronic Monitoring and Electronic Reporting Integrated Database Infrastructure to Support Operational Electronic Monitoring Programs	Developing essential infrastructure and database support to effectively manage Northeast ER and EM initiatives as part of the Fisheries Dependent Data Visioning (FDDV) project, a future-state data collection program that ensures more accurate and timely data collections while preserving decades of archived data, along with effectively integrating ER/EM data into existing data systems.	Supports data modernization initiatives by streamlining independent EM and ER collections into a single cohesive and functioning system for the purpose of building in efficiencies and consistency to fisheries-dependent data collection.	NEFSC (Brant McAfee, Mike Morin, Nichole Rossi)
GOFISH: A Tool for Industry to Maximize Fishing Opportunities & Incentivize More Accurate Self-Reported Data Using the Fisheries Logbook and Data Recording Software Electronic Logbook	Developing a prototype data sharing platform that attempts to redefine the collection, storage, distribution, analysis and impact of fisheries-dependent data using a) data visualization and analysis applications on electronic logbooks, along with b) decentralized databasing using blockchain technology, through refining the Graphical Onboard Fisheries Informatics System Homepage (GOFISH) application.	Develops and evaluates new technologies in fisheries-dependent data electronic reporting and databasing in order to improve accuracy of reported data and support industry-science partnerships.	NEFSC (John Manderson, Jeffrey Pessutti)
One-Touch Reporting	Gathering regionally-based information to support a streamlined one-touch reporting capability for commercial fishermen, who must currently provide numerous data streams while at sea (such as initial observer trip notification, Vessel Monitoring System (VMS), logbooks, catch data (e.g., fish ticket landings), and observer discard and retained catch details), which are all handled differently by the five regions, resulting in inefficiencies in data management and access.	Improves the accuracy, completeness, timeliness, and accessibility of fisheries-dependent information by developing standards for the regional fisheries for vendor compliance.	Northwest Fisheries Science Center (Brett Alger, Todd Hay)
Electronic Monitoring Pre-implementation in Hawaii-permitted Longline Fisheries - Continued Phased Deployment and Back-end Data Integration	Continuing work on EM pre-implementation trials in the Pacific Islands Region by comparing data between EM and other fishery-dependent data streams and working to reduce variation in data produced by different EM system configurations by standardizing configuration.	Addresses data gaps and quality in fisheries-dependent data collection and develops efficient technology for effective collection and use of these data.	Pacific Islands Fisheries Science Center (Keith Bigelow, John Kelly)
ER Implementation for USA Longline Fisheries in the Pacific Islands Region	Implementing ER for the Hawaii- and American Samoa-permitted longline fisheries in order to provide more certainty in catches and avoid premature fishery closures.	Migrates an ER systems from pre-implementation/limited deployment into full operations.	PIFSC (Keith Bigelow)
Pacific Islands Regional Office Observer Program eReporting: Continue Development of an eReporting Application and Platform	Moving the Pacific Islands Region eReporting pilot project from the successful independent validation and verification stage to a deployable and integrated application.	Moves ER projects from pre-implementation stages to implementation and increases the efficiency of collecting high-quality, complete and timely observer data.	Pacific Islands Regional Office (John Kelly)
West Coast HMS Observer Database Remodel and Data Entry/Management Application	Overhauling the West Coast HMS Observer database to bring data into a modern format, making it easier to integrate with logbooks, landings, permits, and VMS data from the same fishery, and creating new data entry and management applications to enable data managers and researchers to keypunch data, validate data, and access the data for scientific investigations and reporting.	Integrates HMS data and improves access to comprehensive, high quality, timely fisheries information through collaborative efforts between partners.	Pacific States Marine Fisheries Commission (Jenny Suter)
Modification of SEFSC's Unified Data Processing System to Manage Electronic For-Hire Logbook Data Reported Through ACCSP	Modifying the current structure of SEFSC's Unified Data Processing System (UDP) to support the expected implementation of mandatory for-hire e-logbook submission in FY 2020 by accommodating recreational for-hire trip-level reporting, extracting information from the ACCSP E-trips database, and developing the ability to pass data entry warnings back to for-hire captains for more timely correction.	Supports timely and accurate submission of fisheries-dependent data.	Southeast Fisheries Science Center (Dave Gloeckner)
Menhaden Program Improvement Through Implementation of Electronic Data Collection Systems	Implementing preliminary electronic reporting for the Menhaden Sampling Program port samplers using electronic fish measuring boards, scales, and tablets for data entry and secure transmission, as a first step in transitioning all Menhaden Program data from paper to electronic reporting.	Migrates existing data reporting systems to ER to improve accuracy, timeliness, and efficiency.	SEFSC (Ray Mroch)
Implementation and Deployment of a Tablet Application for Longline Monitoring Observer Program	Implementing a mobile application that will allow at-sea observers to remotely transfer data into existing databases, allowing for faster evaluation and analysis of data from bottom longline fisheries.	Provides reliable, extensive, economical, and nearly instantaneous fisheries-dependent catch information from at-sea observers.	SEFSC (Heather Moncrief-Cox)

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2019 FIS/CSP/ET-Funded Projects (continued)

Project Name	Description	Support for FIS Vision	Lead Office (Project Principals)
4G Transition of the Cellular Electronic Logbook (cELB) Program for the Permitted Commercial Shrimp Fleet in the Gulf of Mexico	Transitioning the NMFS 3G cELB program to a 4G program in order to continue to collect shrimp fishing effort information in the Gulf of Mexico that is critical in annual stock assessments for three shrimp species, the red snapper rebuilding plan, and sea turtle species BioOps.	Enhances fisheries information collection, management, and dissemination to improve the accuracy, completeness, timeliness, and accessibility of fisheries-dependent information.	SEFSC (<i>Rick Hart</i>)
Improve the Accuracy of SE In-Season Annual Catch Limit (ACL) Monitoring Information Presented to the Public to Assist Industry with Resource Allocation Decisions	Developing an automated process to deliver up-to-date electronically reported landings information to the ACL website at the Southeast Regional Office, replacing the current weekly manual update process and allowing industry to make more timely decisions about which fisheries to participate in.	Improves access by managers and the public to high-quality, accurate and timely information by investing in efficient technology and building effective coordination.	SEFSC (<i>Dave Gloeckner</i>)
Improve Recreational Datasets on SEFSC Oracle Server to Increase Availability of Management Advice	Making further improvements to recreational data from the Southeast by accounting for new MRIP and state-run surveys in the process to integrate recreational data extraction processes into an Oracle database with reporting capability in APEX.	Streamlines and automates recreational fisheries data extraction and integration processes to aid in stock assessment and management.	SEFSC (<i>Dave Gloeckner</i>)
Automation of HMS Vessel Monitoring System (VMS) Image Monitoring Sampling in the Atlantic Pelagic Longline Fishery	Developing an automated process to clean and reformat VMS data from HMS trips, create sequence numbers for trips and set, and make the selection of sets to be sampled by this program, replacing the current manual system, saving staff time, and increasing accuracy.	Improves timeliness and accuracy of the information used to select samples for validation of logbook set information using the EM images captured during that set.	SEFSC (<i>Dave Gloeckner</i>)
Migration of Shrimp Observer Data to SEFSC Warehouse to Improve Accuracy and Availability of Information Needed for Southeast Data, Assessment, and Review (SEDAR) Stock Assessments	Bringing shrimp observer data, effort, catch and length composition information (which is currently housed at the Galveston lab and requires significant staff time to transfer to the Miami lab) into the SEFSC data warehouse via an automated process that will make information more readily available for scientists and managers, increasing the number of assessments completed and improving the accuracy of information used for management advice.	Improves information management and dissemination to facilitate increased accuracy and completeness of fisheries-dependent data.	SEFSC (<i>Dave Gloeckner</i>)
Expansion, Enhancement, and Integration of Three Fishery-Dependent Electronic Reporting Datastreams for Improved Data Management and Quality	Implementing barcoding in conjunction with expanding and enhancing current electronic data collection systems within the SEFSC (Trip Interview Program, Southeast Region Headboat Survey, and Bio-Sample Database) to improve the timeliness and quality of stock assessment data produced from allied SEFSC programs while reducing staff burden.	Enhances ER systems through developing and implementing a system to integrate and streamline existing datastreams and improve the management and quality of data programs, via barcoding.	SEFSC (<i>Jennifer Potts</i>)
Upgrade for the Legacy Electronic Reporting System Housing the Catch Shares and Permits Programs	Transitioning legacy database and front-end applications for the Catch Share and Permit Information Management System (PIMS) to modern, cloud-based technologies with minimal impact to stakeholders, and reducing the risk of future disruptions.	Improves and replaces legacy production ER system components that use outdated technologies, and enhances communications among other regional databases.	Southeast Regional Office (<i>Jessica Stephen</i>)
Documenting Historical Catch and Length Estimates from Historic Photos in the For-Hire Sector Using Electronic Data Collection and Imagery Analysis Platforms and Crowdsourcing Approaches	Developing a standardized protocol for analyzing historic photos from a for-hire charter fleet based in Florida to document the beginnings of the South Atlantic for-hire fishery and collect data on catch and length composition prior to when dedicated fishery-dependent surveys began, through the crowdsourced submission of photos.	Expands and enhances ER systems to integrate a new data stream (of historic photos) and improve regional awareness and outreach surrounding ER.	SERO (<i>Amber Von Harten</i>)
Advancing the Priorities of the National Observer Program by Enhancing the Quality and Utility of Data Collected by Observers and Increasing the Accessibility of National Bycatch Report (NBR) Data	Improving access to National Bycatch Report data by transitioning from the Excel spreadsheets currently available on the web portal to an interactive webpage where fisheries scientists and any other stakeholders could view, analyze, and download NBR data and products in a way that allows visualization of the data.	Enhances the completeness and accessibility of fisheries-dependent information by providing a central repository of national bycatch information available to any interested parties.	Southwest Fisheries Science Center (<i>Elliott Hazen</i>)
Using Speech Recognition For Collecting Commercial Market Sample Data	Using a speech recognition-based program for port samplers to collect commercial groundfish market sample data through the California Cooperative Groundfish Survey (CCGS), which collects data used to estimate species specific landing estimates and provide biological information about the California commercial groundfish fishery, in order to reduce transcription errors and increase efficiency.	Improves efficiency and quality of field data collection system using speech recognition to reduce transcription errors and provide immediate feedback to samplers.	SWFSC (<i>Brenda Erwin, Donald Pearson</i>)
West Coast HMS Fisheries Database Development and Data Integration	Building on the new West Coast HMS fishery-dependent data warehouse at PacFIN to implement automated trip integration for West Coast HMS fishery data, in order to deliver drastically improved access to fishery-dependent data for fishery managers, researchers, and the public by making vessel trip information available alongside set-specific catch and effort data from logbooks and/or observers and unloading information from port sampling and landings, all integrated through a standardized code.	Integrates HMS data and improves access to comprehensive, high quality, timely fisheries information through collaborative efforts between partners.	West Coast Regional Office (<i>Craig D'Angelo</i>)
Specifications and Allocations Database (SPEX DB) for the West Coast Groundfish Fishery	Developing an online database of annual harvest specifications and allocations used to manage West Coast groundfish fisheries, in order to support the biennial process for deciding groundfish harvest specifications and management measures, and to serve as documentation for those decisions to aid in developing federal fishery regulations and subsequent analyses.	Improves the completeness, accuracy, timeliness and accessibility of fisheries information	WCRO (<i>Kelly Ames</i>)
Machine Vision Automation of Video Analysis in the West Coast Groundfish Trawl and Fixed Gear Fisheries	Exploring machine vision solutions for automating the process of reviewing video data for catch and discards, which will reduce the expense and time needed for video analysis by human observers.	Develops and implements EM systems.	WCRO (<i>Matt Dunlap</i>)

2020 FIS/CSP/ET-Funded Projects

Project Name	Description	Support for FIS Vision	Lead Office (Project Principals)
Utilize Quality Management Tools to Improve Data Provision for Atlantic States Marine Fisheries Commission (ASMFC) Stock Assessments	Bringing together all parties (ASMFC, regional councils, state agencies, regional NOAA Fisheries offices and science centers) involved in providing data for ASMFC stock assessments to use QM tools to examine the current stock assessment process, identify areas of waste, and brainstorm solutions for process improvement.	Provides more reliable, timely, and transparent data for the ASMFC stock assessment process.	ACCSP (<i>Julie DeFillippi Simpson</i>)
Integrating Fishery-Dependent Data with Satellite Environmental Data to Develop NOAA's Capabilities for Dynamic, Near Real-Time Ocean Management Across the Pacific Ocean	Linking environmental datasets obtained from satellites (e.g., sea surface temperature, chlorophyll, sea surface height) with fishery-dependent datasets (e.g., fish tickets, observer data, vessel monitoring system data, automatic identification system data) housed within the FINs in order to better understand how fish and fishing fleets are responding to changing climates along the Pacific Coast.	Integrates environmental data with fishery datasets to address current gaps in the understanding of environmental drivers, and promote integrated, accessible, timely data.	AFSC (<i>Jordan Watson</i>)
Collaboration, Implementation and Automation (CIA)	Building partnerships with EM researchers across all science centers to accelerate development of electronic monitoring and machine vision nationally. The electronic monitoring innovation project (eMIP) team will work collaboratively with EM researchers to identify system designs (such as chute and stereo cameras) that best support fleet and management needs to provide the type of data (such as length compositions and weight) typically collected by fisheries observers.	Adapts fishery-dependent data collection systems to new technologies; improves timeliness, cost effectiveness, and data quality; supports regional data and management modernization efforts.	AFSC (<i>Jennifer Ferdinand</i>)
'One Stop Reporting' Electronic Vessel Trip Report (eVTR) Technical Specifications	Developing technical specifications of an eVTR system that will enable the submission of a single eVTR to satisfy the reporting requirements of all the affected East Coast fishing management authorities, helping to eliminate duplicative reporting requirements associated with various regional and state partners.	Increases reporting efficiency to improve trip-level reporting compliance and enhance overall data accuracy and completeness.	GARFO (<i>Barry Clifford</i>)
Electronic Document Data Interface (EDDI)	Developing a cloud-ready validation system, EDDI, to allow users to submit required reports (such as VTRs or EM reports), forms (such as vessel or permit operator renewals), or other data to GARFO via web applications and instantly receive feedback if the submission requirements are not met, resulting in higher quality, more timely data for GARFO at a lower cost.	Increases speed of data processing to real-time, while reducing maintenance overhead, and allowing better adaptation to rapidly changing programs like EM.	GARFO (<i>Torey Adler</i>)
Promoting the Expansion of Commercial Electronic Vessel Trip Reporting in the Greater Atlantic Through Communication and Outreach	Developing an outreach and communication strategy to promote the widespread adoption of electronic vessel trip reports (eVTRs) by creating and implementing a hands-on training program to train vessel operators in how to use eVTR reporting tools, facilitating focus groups with current eVTR users and industry representatives to solicit feedback on specific features of eVTR applications, and producing outreach materials, including procedural manuals and FAQs.	Makes ER systems more accessible and desirable to users through both education and training, and improves awareness and promotes adoption of eVTR.	GARFO (<i>Jerome Hermesen</i>)
Electronic Data Capture in the Field for Recreational Fishing Access Point Intercept Surveys on the Atlantic and Gulf Coasts of Florida, and the Gulf Region	Implementing the use of tablets to electronically capture data for the Marine Recreational Information Program (MRIP) program's Access Point Angler Intercept Survey (APAIS) in the Gulf region, reducing time and expense required to transmit data, along with reducing errors through building quality control checks into the software and eliminating transcription errors that occur with the current paper forms.	Streamlines how data are collected in the field and transmitted to Gulf States Marine Fisheries Commission and enhances the quality of data submitted to NOAA Fisheries.	GSMFC (<i>Gregg Bray</i>)
Catalyzing the Development of an Automated Species Verification Program by Combining Existing Image Libraries with Computer Vision Algorithms	Moving toward the automation of the Northeast Fisheries Sampling Branch Species Verification Program, which requires fisheries observers to submit images of individual organisms encountered so staff can assess the accuracy of observer species identification. By combining the existing large image data set in the program with "off-the-shelf" algorithms for image classification, this project aims to create a more formal image classification system that could be used to integrate automated image analysis for the program.	Facilitates the integration of new technology into existing fisheries information systems and encourages the development of tools that can be adopted by other partners.	NEFSC (<i>Andrew Jones</i>)
Administering Electronic Monitoring and Portside Sampling in the Atlantic Herring Fishery	Implementing the New England Fishery Management Council's Industry-Funded Monitoring (IFM) Omnibus Amendment, which includes an option for combined EM and portside sampling for midwater trawl vessels participating in the Atlantic herring fishery, by covering infrastructure and personnel costs to administer EM and portside sampling, along with offsetting industry costs associated with EM video review and storage to encourage utilization of the EM/portside sampling option.	Migrates EM programs from pre-implementation stage to full operations, and streamlines independent EM and portside sampling data collection into a single cohesive system.	NEFSC (<i>Glenn Chamberlain</i>)
West Coast Observer Integrated Electronic Reporting	Integrating the West Coast Groundfish Observer Program (WCGOP) and At-Sea Hake Observer Program (A-SHOP) data systems into a common, unified West Coast Observer Integrated Reporting capability system for all West Coast groundfish fisheries.	Integrates data streams, decreasing data preparation time and subsequent reporting to support management decisions.	NWFSC (<i>Neil Riley</i>)
Trips Application Programming Interface (API) - West Coast - One Touch Reporting	Developing a Trips API for West Coast fisheries to create unique trip identifiers for use throughout an entire trip life cycle, enabling linking information such as Office of Law Enforcement (OLE) declarations, observer bycatch, vessel logbook, catch monitor results, and dealer/state fish tickets, and eliminating countless staff hours currently required to link these data streams.	Streamlines the electronic reporting of fisheries-dependent data, and helps improve the accuracy, completeness, and timeliness of the data.	NWFSC (<i>Todd Hay</i>)
Data Integration for Stock Assessments	Establishing a set of consistent quality control and data transformation techniques for fisheries-dependent and -independent data streams routinely used for West Coast groundfish stock assessments, resulting in streamlined data streams that are improved in quality.	Integrates data streams, improves quality of data, and reduces the time required to perform stock assessments.	NWFSC (<i>Beth Horness</i>)
Integration of Voice Recognition Technology into Oregon Department of Fish & Wildlife's Market Sampling Protocols for Monitoring Commercial Groundfish Landings	Developing and deploying a computerized system for ODFW incorporating voice recognition technology to increase efficiency and accuracy of commercial fishery dockside sampling at Oregon ports, replacing handwritten notes on plastic slates that must then be entered into a server with information entered via voice and validated instantly by the system.	Increases efficiency, maximizes accuracy, reduces data processing time spent in the field and office, and limits intrusion into active fishing operations.	Oregon (<i>Cameron Sharpe</i>)
Integrating Fishery-Dependent Data to Assist Law Enforcement Efforts to Ensure Compliance with West Coast Commercial Fisheries Regulations, and to Improve Data Quality for Regional Management	Integrating fishery-dependent data in the PacFIN data warehouse to make violations accessible to state and federal enforcement officers on the West Coast in a secure online application that highlights potential violations and provides the ability to assign work, track and make notes regarding active investigations, and coordinate investigations.	Improves data completeness, timeliness, quality, and accessibility to assist West Coast law enforcement officers.	PacFIN (<i>Robert Ames</i>)

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2020 FIS/CSP/ET-Funded Projects (continued)

Project Name	Description	Support for FIS Vision	Lead Office (Project Principals)
Integrating Fishery-Dependent Data to Identify Target Fishery and Unique Fishing Trips	Integrating fishery-dependent data on the West Coast, including fish ticket landings, observer data, logbook data, VMS data, OLE declarations, federal and state permits, and electronic monitoring data to categorize shoreside deliveries into target fisheries and determining unique fishing trips. Defined target fisheries and consistently derived trips will improve regional management processes, analysis, and policy-making.	Improves data quality by implementing business rules and creating processes to flag other issues, and increases precision of target fisheries and determinations.	PacFIN (<i>Niehls Leuthold</i>)
West Coast Observer Database Modernization Phase II	Continuing work to remodel and modernize the database that housed West Coast HMS observer data from large-mesh gillnet and set net trips by building a web-based data entry and management application for observer data from both gillnet and buoy gear fisheries. This will be designed as a multi-platform integrated data entry and management solution accessible on-board a vessel or in an office, and a web API will also be developed on the database, making future changes in data collection adaptable.	Improves access to timely fisheries data by integrating HMS data and utilizing quality management principles and tools.	PacFIN (<i>Jenny Suter</i>)
ER Implementation for USA Longline Fisheries in the Pacific Islands Region with a Regulatory Framework	Transitioning ER technologies from pre-implementation to full implementation for the Hawaii- and California-based longline fisheries, building on previous funding used for software development, procuring ER tablets, encryption key management, satellite data transmission, back-end database development, ER outreach with fishers, and translation of software user manuals into Vietnamese and Korean.	Moves ER systems from pre-implementation to full operation.	PIFSC (<i>Keith Bigelow</i>)
Catch Handling to Optimize Electronic Monitoring in the Pacific Islands Longline Fisheries	Enhancing EM data in Hawaii longline fisheries by: working with fishers to research how altered catch handling protocols may improve discard detection and identification via EM; developing a steering committee to guide EM implementation, installing additional EM systems to increase coverage in the region; and automating imagery of discarded fish and protected species for machine learning.	Addresses data gaps and develops efficient technology for effective collection and use of fisheries-dependent data; promotes visibility of EM technologies.	PIFSC (<i>Matthew Carnes</i>)
Electronic Monitoring in Gulf of Mexico Shrimp Fishery	Building EM capabilities in the Gulf of Mexico shrimp and menhaden fisheries through outreach to the fishing industry, determination of the most appropriate monitoring and sensor system(s), deployment of systems on volunteer vessels, annotation of collected imagery, and retraining of algorithms developed by the Alaska Fisheries Science Center to develop new image analyses and support automation.	Modernizes data collection and data management by leveraging FIS/ NOP investment in development of innovative tools and machine vision.	SEFSC (<i>James Primrose</i>)
Expansion of Southeast Region Headboat Survey (SRHS) ER Compliance Tracking System to Include All Federally Permitted For-Hire Vessels in the South Atlantic and Gulf of Mexico	Supporting implementation of electronic logbook data collection for the for-hire fishery in the South Atlantic and Gulf of Mexico by modifying and expanding the existing SRHS Oracle system and integrating QA/QC checks, compliance tracking data, master vessel lists, current contact lists, connectivity to SERO Permit Office and the Office of Law Enforcement, and automated notifications to alert captains of deficiencies.	Improves data accuracy, data timelines, and operational efficiency for verifying electronic logbook data submission.	SEFSC (<i>Kenneth Brennan</i>)
Migration of Southeast Region Headboat Survey ER Oracle System to ACCSP	Migrating the SRHS database system to ACCSP, which will also manage the Southeast For-Hire Integrated Electronic Reporting (SEFHIER) database, in order to facilitate the integration of existing infrastructure and increase operational efficiency for the SEFHIER and the SRHS programs.	Consolidates data streams, increases efficiency, creates clear and consistent requirements, and expedites development of systems for new data streams.	SEFSC (<i>Kenneth Brennan</i>)
Improve Documentation of Automation Processes through Data Flow Diagram Training	Supporting work to automate and standardize fishery-dependent data inputs required for SEFSC stock assessments by employing data flow diagrams to clearly show when various data sources (including commercial and recreational landings, discards, and size composition data) are used, as well as processing steps necessary for the creation of the final datasets.	Improves the quality and timeliness of fisheries data used in assessments through standardization and increased efficiency, and allows better incorporation of future data streams.	SEFSC (<i>Vivian Matter</i>)
Catalog and Standardize Regulatory Histories for Integration, Automation, and Consistent Validated Utilization in Fisheries Management	Completing a database to detail all management actions affecting federally managed species throughout the Gulf of Mexico, South Atlantic, and US Caribbean regions, in order to better understand the management history of fisheries and correctly utilize the fisheries data maintained by the FIN to produce valid stock assessments and management advice.	Establishes best practices, adapts data collection to meet current and future needs, builds and integrates information management systems, and supports collaboration.	SEFSC (<i>Vivian Matter</i>)
Implementation of Electronic Reporting Program for For-Hire Vessels in the Gulf of Mexico and Atlantic	Supporting implementation of electronic reporting by for-hire vessels in the Gulf of Mexico and Atlantic by: developing quality assurance and quality control protocols for incoming data; developing queries to analyze and review data for management and compliance; monitoring GPS devices for compliance; updating and maintaining outreach materials; enhancing training materials; creating hands-on training for for-hire permit holders and captains; and developing a help desk service to address questions from constituents.	Improves the accuracy, completeness, timeliness, and accessibility of fisheries-dependent information.	SERO (<i>Karla Gore</i>)
Pacific HMS Web Reports	Replacing current, ad hoc reporting efforts for Pacific regional fishery management organizations with automatic creation of routine reports, and integrating summary processes at SWFSC and PIFSC to replace current antiquated processes that involve copying and pasting data from one spreadsheet to another.	Provides timely, high quality, accurate fisheries-dependent information to customers and stakeholders.	SWFSC (<i>John Childers</i>)
West Coast Coastal Pelagic Species Data Consolidation and Integration	Moving data sets for coastal pelagic species such as northern anchovy, market squid, Pacific sardine, Pacific mackerel, and jack mackerel (traditionally data-poor species with highly variable geographic distributions) into a centralized system that can be integrated with other fisheries data sets, making the information more accessible to researchers, stock assessment scientists, fisheries managers, and stakeholders.	Improves access to comprehensive, high quality, timely fisheries information via centralized systems.	SWFSC (<i>John Childers</i>)
Specifications and Allocations Database (SPEX DB) for the West Coast Groundfish Fishery (Phase 2)	Developing an online database of annual harvest specifications and allocations used to manage West Coast groundfish fisheries, in order to support the biennial process for deciding groundfish harvest specifications and management measures by the Pacific Fishery Management Council and NOAA Fisheries, and archiving the database to help document the decision and aid in developing and analyzing federal fishery regulations.	Improves the completeness, accuracy, timeliness, and accessibility of data to make informed fishery management decisions.	WCRO (<i>Brian Hooper</i>)
Monitoring Standard Deep Set Buoy Gear (SDSBG) and Linked Deep Set Buoy Gear (LDSBG) by Using Radio-Frequency Identification (RFID) Technology	Applying RFID tags with unique serial numbers, recording time and date stamp information to gear used in the DSBG Exempt Fishing Permit (EFP) swordfish fishery, in order to address complications that can arise when recording data regarding LDSBG gear deployment because of the highly variable gear deployment combinations.	Enhancing observer data capture with ER tools to streamline observer data flow and enable observers to focus more on sampling procedures.	WCRO (<i>Jody Vannierkerk</i>)