Department of Commerce (DOC)

National Oceanic and Atmospheric Administration (NOAA) Office of Oceanic and Atmospheric Research (OAR)

Weather Program Office (WPO)
TASK ORDER NINE (TO9)

PERFORMANCE WORK STATEMENT (PWS)

Earth Prediction Innovation Center (EPIC)

Contract 1305M321DNRMN0002

June 2025

EXECUTIVE SUMMARY

This Performance Work Statement (PWS) outlines the Earth Prediction Innovation Center (EPIC) requirements for obtaining software engineering and scientific and technical support services on open-source code repositories as well as on-premise, cloud, and limited testing environments, to develop stakeholder and community engagement activities, and to provide robust user support for easy access to the latest version of the Unified Forecast System (UFS), a community-based, coupled, comprehensive Earth modeling system.

The contractor shall deploy a software infrastructure, advanced user support services, and community/stakeholder engagement activities to facilitate innovation and accelerate research to operations including through an extramural, virtual center to:

- Encourage strong collaboration with the UFS community across the Weather Enterprise.
- Develop a publicly accessible end-to-end testing and development environment on the cloud, from pre- to post-processing, for NOAA's core UFS Weather Model and UFS Apps, including but not limited to:
    - The UFS Short-Range Weather (SRW) App,
    - The UFS Global Apps[1], and
    - The UFS community data assimilation System[2].
- Continue developing a publicly accessible software infrastructure that is extensible to incorporate additional UFS Apps as they come online.
- Demonstrate EPIC success by bringing in innovations to improve UFS performance.

EPIC will continuously integrate and develop the community-modeling environment with all partners in the Weather Enterprise through a community-based, coupled, comprehensive Earth system model, the UFS, to improve NWP and accelerate the Research to Operations and Operations to Research (R2O2R) process. The UFS numerical applications span local to global domains and predictive time scales from sub-hourly analyses to seasonal predictions. Designed to support the Weather Enterprise, the UFS is the source system for NOAA's operational NWP applications.

The Contractor shall provide all Scientific and Technical Support Services supporting EPIC, as outlined in this PWS, following the approved contract 5-year Project Management Plan (IDIQ PMP) and 5-Year EPIC Contract Strategic Implementation Plan, as well as a task-order PMP to be developed as part of this PWS. The task order will be managed through the Weather Program Office (WPO) within NOAA's Oceanic and Atmospheric Research (OAR) Line Office.

BACKGROUND

The Department of Commerce (DOC), NOAA, and OAR's WPO support world-class weather and air quality research, leading to advancements in NOAA's forecasting capabilities that save lives, reduce property damage and enhance the national economy.

In pursuit of NOAA's vision and mission, WPO works closely with NOAA's Weather Service to help develop and transition scientific innovations to NWS' operational suite of weather and air quality forecast models, such as improved predictions for hurricanes, severe thunderstorms, heavy precipitation, and air pollution. WPO selects and funds research that supports and fosters collaborations within NOAA's research laboratories and across the weather enterprise (i.e., NOAA, other Federal agencies and entities, state and local governments, academia, and the private sector). In short, WPO supports the improvement of NOAA's operational weather and climate forecast systems through scientific and technical innovation, reducing the devastating impacts of hazardous weather protecting life and property and enhancing the national economy.

The Weather Research and Forecasting Innovation Act of 2017 (WRFIA, Public Law 115-25) directs NOAA to prioritize improving weather data, modeling, computing, forecasting, and warnings to protect life and property and enhance the

[1] The UFS Global Apps refer to any end-to-end model configurations supported by global-workflow or its variations, including but not limited to: medium-range weather, sub-seasonal to seasonal, and seasonal forecast configurations.
[2] The UFS Community DA System refers to a community-oriented data assimilation testbed that enables the testing and training of Joint Effort for Data Assimilation Integration (JEDI) in the UFS framework by integrating Unified Workflow tools and JEDI Configuration Builder (JCB)

national economy. The authorizing language for EPIC, in the National Integrated Drought Information System Reauthorization Act of 2018 (NIDISRA, Public Law 115- 423), calls for NOAA to accelerate community-developed scientific and technological enhancements into the operational applications for NWP, which requires "advancing weather modeling skills, reclaiming and maintaining international leadership in the area of numerical weather prediction, and improving the transition of research into operations."

EPIC's vision is to enable the most accurate and reliable operational numerical forecast model in the world. EPIC's mission is to be the catalyst for community research and modeling advances that continually inform and accelerate advances in our nation's operational forecast modeling systems. In the near term, this means enhancing NWP skill in the UFS as a whole and in the component UFS Apps. In the long-term, this means expansion to other operational model applications such as high-resolution convective-allowing models and fully coupled sub-seasonal-to-seasonal, water, and ocean forecast systems.

For additional information about EPIC, see EPIC.noaa.gov and for details about the UFS see ufscommunity.org.

OBJECTIVES AND SCOPE

Building upon progress made in previous task orders, the objective of this task order is to make continuous progress toward the strategic outcomes as defined in the EPIC Contract 5-Year Strategic Implementation Plan as follows:

1. Provide the foundation of the Earth Prediction Innovation Center
2. Encourage strong collaboration with the UFS community across the Weather Enterprise
3. Develop a publicly accessible end-to-end testing and development environment on the cloud, from pre- to post-processing, for core UFS Weather Model applications that is extendable to incorporate additional UFS applications as they come online.
4. Demonstrate EPIC success by bringing in innovations to improve UFS performance

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8. Demonstrate EPIC success by bringing in innovations to improve UFS performance

In previous task orders, the EPIC contract has developed a framework for establishing and maintaining the Earth Prediction Innovation Center:

- **Project Management.** Provide a consistent project management approach that prioritizes strategic goals, integrating priorities across Agile Teams, Train Leads, Business Owners and Stakeholders, ensuring a high-rate of objectives completion and achieving high-levels of business value.
- **Infrastructure.** Established and enhanced a cross-cutting community platform as the public-facing interface of the UFS, including the EPIC Community Portal (ECP, epic.noaa.gov), integrated with continuous integration and continuous delivery (CI/CD) pipelines to enable a public-facing testing and development environment that leverages on-premise and cloud high-performance computing resources provided by NOAA and partners, hosted in the NOAA enterprise IT system.
- **Code Management.** Established and enhanced platform-agnostic containerized versions of the UFS code, including configurations, applications and selected components, to ensure portability and usability of on-premise and cloud High Performance Computing (HPC) platforms. Support and expand a code management framework for UFS code that follows an agreed-upon system architecture and infrastructure design and best practice following an open-source and open-development paradigm. This system architecture facilitates the transition of research to open source code and operations within NOAA, taking into account the needs of research and operational modeling communities.
- **Systems Integration.** Established the process to support end-to-end prototypes and continuous integration of UFS configurations, applications and selected components, a unified build-test package management system for the UFS including but not limited to the data assimilation framework (e.g., Joint Effort for Data Assimilation Integration, JEDI), and continuously update the EPIC Community Portal (ECP) to integrate the objectives of this task order.
- **Data Management.** Established a data management and ingestion framework for unit, regression and scientific testing of the UFS WM, applications and selected components.
- **Tracking UFS performance and skill improvement**. Initiate a hierarchical testing and development framework that continuously tracks improvements in UFS computational performance and forecast skill.
- **Community Releases**. Establish the process and protocols of community releases for UFS applications and components, including release plans and a framework for continuous coordination and support.
- **Advanced User Support.** Support and improve the advanced user support framework.
- **Community Engagement.** Explored approaches to effectively engage the UFS community in collaboration with UFS application and cross-cutting teams. Facilitates engagement between the UFS modeling community and other modeling communities in the United States.
- **Continuous stakeholder Engagement.** Explored ways to engage key stakeholders that assess key stakeholder priorities and interview key stakeholders on R2O2R priorities, UFS WM, UFS Apps, and components needs, and NOAA operational forecast and modeling system priorities.
- **Artificial Intelligence (AI) and Machine Learning (ML) for NWP.** Established a modeling infrastructure to allow for easy initialization, training, and visualization of AI based numerical weather prediction models.

Based on the established framework , the general scope of this ninth task order (hereafter TO9) is to maintain the foundational aspect of EPIC following established procedures and protocols, and to deliver a number of products that are key to demonstrate EPIC's vision and mission as part of the EPIC strategic implementation plan.

The scope of this task order is as follows:

- Maintain the EPIC community portal (ECP) as a virtual center, including the EPIC website as the front end, and its backend functionalities including an efficient continuous integration and continuous deployment pipeline and testing and development environment for the UFS leveraging NOAA cloud and on-premise computing resources;
- Maintain the existing EPIC public-facing cloud sandboxes and cloud infrastructure as code to enable a prototyping public-facing multi-cloud platform for testing and development of the UFS.
- Maintain and improve the code management and testing UFS WM and selected UFS Apps and configurations,
- Develop and support a community data assimilation software infrastructure to facilitate and accelerate the integration of UFS and Joint Effort for Data assimilation Integration (JEDI).
- Provide advanced user support for UFS WM and selected UFS components and Apps;
- Engage the Numerical Weather Prediction (NWP) and Earth system modeling (ESM) communities in collaboration with the government;
- Support a public-facing, platform-agnostic testing and development software infrastructure outside of the NOAA firewall that leverages the internal NOAA IT infrastructure;

- Facilitate the integration of the Unified Workflow (UWF) toolkit into the UFS that can serve both operational and research communities needs;
- Continuously support a public-facing community modeling infrastructure to allow for easy initialization, training, and visualization of global Artificial Intelligence based numerical weather prediction models using UFS/NOAA analyses (GFS, GEFS, GDAS, UFS-replay) in partnership with the NOAA AI4NWP team;
- Establish a community modeling infrastructure for consolidating and bringing scientific cases into the hierarchical system development (HSD) framework, and a public facing interface for facilitating associated scientific documentation and discussions.
- Lead community releases and capability announcements of selected UFS Apps and configurations, focusing on UFS Global Apps and GEFS-AI;
- Demonstrate a publicly accessible and platform-agnostic, end-to-end testing and development software infrastructure for supported UFS Applications, from pre- to post-processing, for selected UFS applications;
- Demonstrate EPIC success by bringing in innovations to improve UFS performance by providing support to developers.

TASKS

All tasks are associated with deliverables described in Section 5 Deliverables. Requirements for deliverables are provided in Section 9 Performance Requirement Summary (PRS).

4.1. PMP in accordance with the Project Management Book of Knowledge (PMBOK), Seventh Edition, to fulfill the requirements of this Task Order.

4.1.1. Develop a PMP featuring a consistent project management approach that prioritizes strategic goals, integrating priorities across Agile Teams, Train Leads, Business Owners and Stakeholders, ensuring a high-rate of objectives completion and achieving high-levels of business value (80% or above).

4.1.2. Review and revise the existing transition-out plan to ensure smooth transition of all contract activities back to the government;

4.1.3. Execute transition-out activities in accordance with the approved transition-out plan in 4.1.2

4.2. Deploy a cross-cutting community infrastructure to accelerate research to operations and operations to research for the UFS.

4.2.1. Continuously support and consolidate the EPIC integration and continuous delivery (CI/CD) pipeline across cloud and on-premise HPC resources, ensuring that the platform agnostic UFS WM code is built and tested automatically on Tier-1 platforms.

4.2.2. Support an automated build and build-testing framework for the UFS WM and supported applications using spack-stack as the package management system and state-of-the-art containerization technology.

4.2.3. Maintain and develop cloud sandboxes as part of the NOAA enterprise cloud environment, enhanced with the platform agnostic software infrastructure as code for ECP, UFS deployment, including internal- and external-facing configurations.

4.2.4. Improve the UFS-WM software process by shifting UFS-WM components toward unit testing, libraries and enforcing code quality in collaboration with the UFS System Architecture and Infrastructure Cross-Cutting team.

4.2.5. Establish a community modeling infrastructure for consolidating the hierarchical system development (HSD) framework with appropriate testing capabilities, and a public facing interface for facilitating associated scientific documentation and discussions.

4.3. Continuously support the code management framework for the UFS WM, selected components, and cross-cutting infrastructure code repositories.

4.3.1. Continue coordinating and supporting the code and repository management of the UFS WM and UFS Apps and configurations;

4.3.2. Continue supporting the seamless integration of EPIC code and repository management environment including a tracking system, wiki and user support to the code management tool used by community developers within the framework of the UFS;

4.3.3. Continue coordinating the Continuous Integration Teams to support the UFS WM and UFS Apps in

collaboration with key stakeholders;

4.3.4. Continue supporting the development of the CICE component in the UFS WM, including design, code and repository management and continuous integration, development and documentation of CICE component software, development practices and processes;

4.3.5. Continue supporting the UFS Stochastic Physics team in their code repository management activities;

4.3.6. Continue developing and supporting a data management framework for findable, accessible, interoperable, and reusable data.

4.4. Continuously support development and integration of the UFS Short-range Weather (SRW) App, a UFS-based community Data Assimilation (DA) system, and UFS Global Apps that can facilitate R2O2R.

4.4.1. Continuously update the UFS application system architecture, infrastructure and software governance document with the UFS System Architecture and Infrastructure Team;

4.4.2. Coordinate reviews and integrate pull requests into the authoritative repositories based on the UFS Application Software Governance Document in 4.4.1;

4.4.3. Develop and deploy a minimal set of workflows end-to-end (WE2E) tests in each authoritative repository for supported applications;

4.4.4. Integrate verification and validation metrics in coordination with the application teams for supported applications;

4.4.5. Improve supported components of supported applications with enhanced DA, preprocessing, postprocessing, and verification and validation capabilities in coordination with the corresponding application teams

4.4.6. Benchmark the computational performance of end-to-end configurations for at least one prototype of each supported application on selected Tier-1 platforms;

4.4.7. Deliver optimized prototypes for supported applications with documentation

4.5. Establish and support a public-facing community modeling infrastructure to allow for easy initialization, training, and visualization of global numerical weather prediction models based on Artificial Intelligence (AI) and Machine Learning (ML) using UFS/NOAA analyses (e.g., GFS, GEFS, GDAS, UFS-replay, HRRR, NOAA-NASA Joint Archive (NNJA) of observations for reanalysis), targeting extramural community members and NOAA scientists.

4.5.1. Support a community AI-modeling backbone or framework to efficiently train AI models on selected hardware platforms available to NOAA.

4.5.2. Co-develop a near-realtime workflow with the NOAA AI4NWP team that allows for deployment of deterministic and ensemble-based configurations of the global AI models.

4.5.3. Develop an AI online portal that will provide capability for near real time forecasts and verification of the AI models developed in 4.5.1.

4.6. Support planned community releases and capability announcements of UFS Apps and configurations.

4.6.1. Continuously update the UFS Release Coordination Vision and Release Coordination CCT Charter;

4.6.2. Continuously support release coordination efforts based on the approved vision and charter in 4.6.1;

4.6.3. Continuously support capability announcements supporting relevant UFS-WM components and Apps.

4.6.4. Support the releases of EAGLE-AI and the UFS Global Apps (e.g., GFS, GEFS, or SFS) .

4.7. Support an advanced user support framework for UFS-WM, UFS HSD framework, SRW App, UFS Community DA System,, Global Apps, EAGLE-AI, UWF, UPP, and stochastic physics.

4.7.1. Coordinate and continuously manage user support forums integrated to the ECP;

4.7.2. Develop and host one Hackathon on EAGLE-AI in coordination with the Weather Program Office and the NOAA AI4NWP team;

4.7.3. Develop tutorials and instructional materials dedicated to community modeling in Earth sciences, understanding, running and developing the UFS;

4.7.4. Continue developing documentation supporting the UFS WM relevant UFS Apps;

4.7.5. Continue supporting and enhancing interfaces that allow users seamless access to EPIC and UFS repositories, wikis, ticketing services, and documentation through the ECP;

4.7.6. Continue supporting and enhancing a set of community modeling user forums integrated with GitHub discussions for UFS WM and EPIC supported applications and configurations;
4.7.7. Continue supporting and enhancing the interface providing selected users access to cloud-based sandboxes or other suitable compute environment for testing of innovations, attending workshops and learning events, and changes to the UFS models,

4.8. Support and update a community engagement strategy associated with EPIC and the UFS community mission and strategic goals.
4.8.1. Continue supporting the EPIC Community Portal (ECP), including dashboards with metrics;interfaces for user access to GitHub code repositories, integrated access to EPIC and UFS GitHub wikis, ticketing/issues, user forums, and access to a user sandbox when applicable;
4.8.2. Continuously roll out and support schedules for maintenance, design and content updates of the ECP and other communication tools .
4.8.3. Continue supporting all the capabilities currently implemented on the EPIC website, and new capabilities added to the ECP;
4.8.4. Host the annual Unifying Innovations in Forecasting Capabilities Workshop (UIFCW);
4.8.5. Plan the next annual Unifying Innovations in Forecasting Capabilities Workshop (UIFCW);
4.8.6. Co-host two workshops in coordination with selected UFS teams;
4.8.7. Continue supporting content development and updates for social media needs of the EPIC program;
4.8.8. Continuously update the communications strategy document;
4.8.9. Continuously support, update and expand frequently-asked questions pages;
4.8.10. Present scientific and technical outcomes in relevant conferences and workshops;
4.8.11. Coordinate the development and publication of a UFS newsletter promoting community and stakeholder engagement

4.9. Support and update a stakeholder engagement strategy associated with EPIC and the UFS community mission and strategic goals.
4.9.1. Continue developing and supporting a framework that integrates EPIC key stakeholder engagement needs;
4.9.2. Continue ensuring that key stakeholder engagement is continuous over time creating opportunities for incorporating stakeholder feedback into relevant work items;
4.9.3. Continuously identify key stakeholder groups and individuals and incorporate them into key stakeholder databases;
4.9.4. Continuously assess key stakeholder priorities and integrate to EPIC feature and user stories backlogs.

DELIVERABLES

All deliverables shall follow requirements provided in Section 10 Performance Requirement Summary (PRS), which also provide performance standards, methods of surveillance and incentives for deliverables. Therefore, PRS items shall be reflected in features and user stories developed as part of the EPIC Scaled Agile Framework (SAFe) process.

Deliverable	Time or Frequency	Medium/Format/# of Copies	Submit To
Per 4.1.1, A PMP featuring a consistent project management approach that prioritizes strategic goals, integrating priorities across Agile Teams, Train Leads, Business Owners and Stakeholders, ensuring a high-rate	One Month after start of this Task Order	MS Word Report via email	COR and TPOC(s)

Deliverable	Time or Frequency	Medium/Format/# of Copies	Submit To
of objectives completion and achieving high-levels of business value.			
Per 4.1.2, Review and revise the existing transition-out plan to ensure smooth transition of all contract activities back to the government.	An updated draft transition-out plan by the end of the first PI; A final transition-out plan by the end of the second PI.	MS Word Report via email	COR and TPOC(s)
Per 4.1.3,Execute transition-out activities in accordance with the approved transition-out plan in 4.1.2	Transition-out activities following the milestone table specified in the approved transition-out plan.	Online[5], HPC resources[6], and MS Word Report via email	COR and TPOC(s)
Per 4.2.1, A continuous integration and continuous delivery (CI/CD) pipeline on EPIC supported platform and/or Infrastructure.	Documentation and relevant online artifacts updated following the milestones table specified in the PMP.	Online and MS Word Report via email	COR and TPOC(s)
Per 4.2.2, An automated build and build-testing framework for the UFS WM and supported applications including containers, and using spack-stack as the package management system for the UFS, approved by the UFS System Architecture Working Group.	Quarterly reports to summarize PRs to the spack-stack authoritative repo consistent with the co-development plan	Online via email	COR and TPOC(s)
Per 4.2.3, Operational and development cloud sandboxes as part of the NOAA enterprise cloud environment that are enhanced with the platform agnostic software infrastructure as code for ECP, UFS deployment, including internal- and external-facing configurations.	Updated Confluence pages by the end of the second and finalPIs in the PoP following the milestones table specified in the PMP.	Online, HPC resources, MS Word Report via email	COR and TPOC(s)
Per 4.2.4, An improved UFS-WM software process by shifting UFS-WM components toward unit	A plan by the end of the first PI in the PoP. Process description and procedures in Confluence pages and available to stakeholders in the PoP	Online and selected cloud platforms	COR and TPOC(s)

[5] Online refers to the EPIC Community Portal (ECP), GitHub and any other EPIC-related and community web-based resources, including social media platforms.
[6] HPC resources refer to cloud and on-premise capabilities.

Deliverable	Time or Frequency	Medium/Format/# of Copies	Submit To
testing, libraries and enforcing code quality in collaboration with the UFS System Architecture and Infrastructure Cross-Cutting team.	following the milestones table specified in the PMP.	resources	
Per 4.2.5, A community modeling infrastructure for consolidating the hierarchical system development (HSD) framework, with appropriate testing capabilities and a public facing interface containing technical documentation and entry points for enabling community contribution and collaborations.	Continuously updated strategic plan, framework description, test cases, documentation and wiki pages as appropriate following the milestones table specified in the PMP.	Online and MS Word Report via email	COR and TPOC(s)
Per 4.3.1, Coordinate and support the code and repository management of the UFS WM and UFS Apps and configurations.	Existing report updated in coordination with the UFS Systems Integration Cross-Cutting Team following the milestones table specified in the PMP.	Online and MS Word Report via email	COR and TPOC(s)
Per 4.3.2, Support the seamless integration of EPIC code and repository management environment including a tracking system, wiki and user support to the code management tool used by community developers within the framework of the UFS	Existing ECP, Confluence SOP, and GitHub pages are updated reflecting community needs following the milestones table specified in the PMP.	Online and MS Word Report via email	COR and TPOC(s)
Per 4.3.3 Coordinate the establishment of Continuous Integration Teams to support the UFS WM and UFS Apps.	Existing Confluence and wiki pages are updated reflecting community needs, following the milestones table specified in the PMP.	Online and HPC resources	COR and TPOC(s)
Per 4.3.4, Support the development of the CICE component in the UFS WM.	Updates to the CICE code management plan and support activities in agreement with the CICE development team and approved by the EPT, reports following the milestones table specified in the PMP.	Online and MS Word Report via email	COR and TPOC(s)
Per 4.3.5, Support the UFS Stochastic Physics team in their code repository management activities.	Updated confluence page, documentation/wiki page as appropriate, A final report on all changes made by the end of the final PI.	Online and MS Word Report via email	COR and TPOC(s)
Per 4.3.6, A data management framework for findable, accessible, interoperable, and reusable data.	Updated Confluence pages, data buckets at NODD or and other relevant online artifacts to improve the model-data integration workflow as	Online and HPC resources, and	COR and TPOC(s)

Deliverable	Time or Frequency	Medium/Format/# of Copies	Submit To
	appropriate, and links/documents on ECP are updated. A final report based on the milestones table specified in the PMP.	MS Word Report via email.	
Per 4.4.1, Updated UFS application software governance, system architecture and infrastructure document.	Updated document in coordination with the UFS SAICCT by the end of the PoP. Document published on EPIC or UFS website as appropriate.	Online and MS Word Report via email	COR and TPOC(s)
4.4.2 Coordinate reviews and integrate pull requests into the authoritative repositories based on the UFS Application Software Governance Document in 4.4.1;	Interim and final reports with PRs submitted/merged, documentation and wiki pages as appropriate following the milestones table specified in the PMP.	Online and MS Word Report via email	COR and TPOC(s)
Per 4.4.3, A minimal set of workflow end-to-end (WE2E) tests in each authoritative repository for supported applications.	A plan with the set of WE2E tests identified and a final report with PRs submitted/merged, documentation and wiki pages as appropriate following the milestones table specified in the PMP.	Online and MS Word Report via email	COR and TPOC(s)
Per 4.4.4, Verification and validation metrics integrated into each application for selected cases.	A plan with verification and validation metrics identified and a final report with PRs submitted/merged, documentation and wiki pages as appropriate following the milestones table specified in the PMP.	Online and MS Word Report via email	COR and TPOC(s)
Per 4.4.5, Improved components of supported applications with enhanced DA, preprocessing, postprocessing, and verification and validation capabilities.	A plan with workflow elements or features in components identified and a final report with PRs submitted/merged, documentation and wiki pages as appropriate following the milestones table specified in the PMP.	Online and MS Word Report via email; Demonstration with accompanying artifacts to include but not limited to a PowerPoint presentation with supporting documentation	COR and TPOC(s)
Per 4.4.6, Computational performance benchmarks of end-to-end configurations for at least one prototype of each	A plan with the configurations and prototype identified and a final report with PRs submitted/merged, documentation and wiki pages as appropriate following the milestones table	Online and MS Word Report via email	COR and TPOC(s)

Deliverable	Time or Frequency	Medium/Format/# of Copies	Submit To
application on Tier-1 platforms.	specified in the PMP.		
Per 4.4.7, At least one optimized prototype for each application with documentation.	General plans online identifying key stakeholders and relevant prototype documentation. Includes a tag as a software release for each prototype.	Online with accompanying artifacts online. Demonstration with accompanying artifacts to include but not limited to a PowerPoint presentation with supporting documentation.	COR and TPOC(s)
Per 4.5.1, a community AI-modeling backbone or framework that efficiently trains AI models on selected computing platforms available to NOAA.	An updated plan indicating selected platforms, provided by the end of the first PI of this TO, updated according to relevant changes every PI. A repo and a draft design and code management plan following the milestones table specified in the PMP.	Online and MS Word Report via email	COR and TPOC(s)
Per 4.5.2, a near-realtime workflow co-developed with the NOAA AI4NWP team that allows for deployment of deterministic and ensemble-based configurations of the global AI models.	An updated workflow design plan provided by the end of the first PI of the TO. Prototypes for global AI models developed in collaboration with relevant stakeholders following the milestones table specified in the PMP.	Online and MS Word Report via email	COR and TPOC(s)
Per 4.5.3, an AI online portal that will provide capability for near real time forecasts and verification of the AI models developed in 4.5.1.	A portal design, deployment and maintenance plan provided by the end of the first PI of the TO. Continuously update according to needs and collaboration with key stakeholders.	Online and MS Word Report via email	COR and TPOC(s)
Per 4.6.1, An updated UFS Release Coordination Vision document and Release Coordination CCT Charter.	By the end of the first PI in the POP following the milestones table specified in the PMP.	Online and MS Word Report via email	COR and TPOC(s)
Per 4.6.2, Support of release coordination efforts based on the approved vision and charter.	Per the charter in 4.6.1. Interim and final reports following the milestones table specified in the PMP.	Online and MS Word Report via email	COR and TPOC(s)

Deliverable	Time or Frequency	Medium/Format/# of Copies	Submit To
Per 4.6.3, Capability announcements supporting relevant UFS-WM components and Apps.	At least twice following the milestones table specified in the PMP.	Online and HPC resources	COR and TPOC(s)
Per 4.6.4, releases of EAGLE-AI and the UFS Global Apps (e.g., GFS, GEFS, or SFS)	At least twice following the milestones table specified in the PMP.	Online and HPC resources	COR and TPOC(s)
Per 4.7.1, Coordinate and continuously manage user support forums integrated to the ECP.	Quarterly report following the milestones table specified in the PMP	Online and MS Word Report via email	COR and TPOC(s)
Per 4.7.2, Develop and host one Hackathon on EAGLE-AI in coordination with the Weather Program Office and the NOAA AI4NWP team;	One event aligned with EAGLE-AI development, release, and training schedule	Online and MS Word Report via email	COR and TPOC(s)
Per 4.7.3, Technical support to the development of tutorials and instructional materials dedicated to community modeling in Earth sciences, understanding, running and developing the UFS.	As needed. Quarterly report following the milestones table specified in the PMP.	Online and MS Word Report via email	COR and TPOC(s)
Per 4.7.4, Documentation supporting the UFS WM relevant UFS Apps.	Documentation is updated reflecting changes in relevant Apps. A single submission final report with rollup of all changes before the end of TO9 PoP.	Online and MS Word Report via email	COR and TPOC(s)
Per 4.7.5, Continuous support for interfaces that allow users seamless access to EPIC and UFS repositories, wikis, ticketing services, and documentation through the ECP.	Updates to Confluence pages once per quarter, aligned to each PI.	Online and MS Word Report via email	COR and TPOC(s)
Per 4.7.6, Continuous support for a set of community modeling user forums integrated with GitHub discussions for UFS WM and EPIC supported applications and configurations.	A web page with a list of all supported forums, updated as needed per the PRS.	Online	COR and TPOC(s)
Per 4.7.7, Continue supporting and enhancing the interface providing selected users access to a cloud-based sandboxes or other	Update existing Confluence and ECP pages updated as needed. Quarterly report on status of the interface.	Online and MS Word Report via email	COR and TPOC(s)

Deliverable	Time or Frequency	Medium/Format/# of Copies	Submit To
suitable compute environment for testing of innovations, attending workshops and learning events, and changes to the UFS models.			
Per 4.8.1, Continuous support for the EPIC Community Portal (ECP), including dashboards with metrics, interfaces for user access to GitHub code repositories, integrated access to EPIC and UFS GitHub wikis, ticketing/issues, user forums, and access to a user sandbox when applicable.	As needed per PRS. Quarterly report noting updates.	Online and HPC resources.	COR and TPOC(s)
Per 4.8.2, Plans and roll out schedules for maintenance, design and content updates of the ECP and other communication tools reflecting user feedback and technology needs and opportunities.	Existing Confluence page updated as approved by EPT and included in the milestones table specified in the PMP. A report with recommendations for subsequent activities by the end of the finalPI	Online and MS Word Report via email	COR and TPOC(s)
Per 4.8.3. Continuous support for all the capabilities currently implemented on the EPIC website, and new capabilities added to the ECP.	Existing SOP, Confluence and ECP pages updated as needed once per quarter, aligned to each PI in the PoP.	Online and Report via email	COR and TPOC(s)
Per 4.8.4, Host the 2025 Unifying Innovations in Forecasting Capabilities Workshop (UIFCW).	Host the 2025 event as planned. Final out brief report delivered 4 weeks after the 2025 event (see Appendix I: UIFCW Annual Report Template).	At location approved according to the 2025 plan; Online	COR and TPOC(s)
Per 4.8.5, Plan the 2026 Unifying Innovations in Forecasting Capabilities Workshop.	2026 Event initial scope, plan and roll out schedule documented during the Second PI of the Task Order.	Online and MS Word Report via email	COR and TPOC(s)
Per 4.8.6, Co-host two workshops or short-courses in coordination with selected UFS teams.	Initial scope, plan and roll out schedule documented during the first PI of the Task Order. Final presentation delivered two weeks after each event.	Online and at the approved locations	COR and TPOC(s)
Per 4.8.7, Continuous development of content and updates for social media needs of the EPIC program.	Existing Confluence pages and documents updated quarterly no later than the end of each PI in the PoP	Online and report via email	COR and TPOC(s)

Deliverable	Time or Frequency	Medium/Format/# of Copies	Submit To
Per 4.8.8, A continuously updated communications strategy document.	Existing document updated as needed per PRS	Online and MS Word Report via email	COR and TPOC(s)
Per 4.8.9, A continuously updated and expanded frequently-asked questions pages.	As needed per PRS; Quarterly reports summarizing the changes.	Online and MS Word Report via email	COR and TPOC(s)
Per 4.8.10, Scientific and technical presentations in relevant conferences and workshops.	AGU, AMS, and other conferences/workshops of business values to the program	In person/Virtual, abstracts/presentation/posters	COR and TPOC(s)
Per 4.8.11, Coordinate the development and publication of a UFS newsletter promoting community and stakeholder engagement	At least two newsletters in the PoP. Provide a publication and distribution SOP by the end of the first PI in the PoP.	Online and PDF document via email.	COR and TPOC(s)
Per 4.9.1, A continuously-updated framework that integrates EPIC key stakeholder engagement needs.	Once per quarter, aligned to each PI.	Online and MS Word Report via email	COR and TPOC(s)
Per 4.9.2, Continuous key stakeholder engagement and opportunities for incorporating stakeholder feedback into relevant work items.	Quarterly Meeting held once per quarter, aligned to each PI, updates to the Confluence page made within 2 weeks of meeting.	Online and MS Word Report via email	COR and TPOC(s)
Per 4.9.3, A continuously-updated key stakeholder databases.	Updates to Confluence pages once per quarter, aligned to each PI.	Online and Report via email	COR and TPOC(s)
Per 4.9.4, Continuous assessment of key stakeholder priorities and its integration to EPIC feature and user stories backlogs.	Existing Confluence page updated once per quarter and following the milestones table specified in the PMP.	Online and Report via email	COR and TPOC(s)

PERIOD OF PERFORMANCE

This Task Order follows the Scaled Agile Framework, which is based off of Quarterly Program Increments (PIs), totaling 3 in the PoP. The anticipated dates of the PIs are as follows, but can be amended with approval from the EPT. Wherever noted, deliverables within this TO sections are aligned via a work plan with the PIs below

- First PI in POP - PI17:
    - PI17 Planning: 06/23/25 - 06/27/25 (reflected in Task Order 8 1305M324F0177)
    - Development Sprints: 07/07/2025 - 09/14/2025

    - Innovation and Planning sprint: 09/15/2025 - 09/28/2025
- Second PI in POP - PI18:
    - PI18 Planning: 09/22/25 - 09/26/25
    - Development Sprints: 9/29/2025 - 12/07/2025
    - Innovation and Planning sprint: 12/8/2025 - 01/11/2026
- Third PI in POP - PI19:
    - PI19 Planning: 01/05/25 - 01/09/26
    - Development Sprints: 01/12/2026 - 04/19/2026
    - Innovation and Planning sprint: 04/20/2026 - 04/25/2026

Some foreseeable changes to this schedule might include adjusting the PI boundaries a week or two, or even shifting a sprint between PIs. The most likely reason to do this is to accommodate high outage dates such as the end of year-end holiday break, spring break or events such as the AMS Annual Meeting.

PLACE OF PERFORMANCE

The place of performance is to be at the direction and discretion of the contractor to fulfill the requirements of this task order in an acceptable manner.

CONTRACT TYPE

This is a Firm-Fixed-Price (FFP) order.

This Task Order has been deemed as a Low-Risk Contract (Security Processing Requirements).

TECHNICAL POINT(S) OF CONTACT (TPOC)

One or more TPOCs will assist the COR as needed. All parties are reminded that this in no way detracts or changes the responsibilities and limitations described in the contract including, but not limited to, CAR 1352.201-70, Contracting Officer's Authority, and CAR 1352.201-72, Contracting Officer's Representative (COR). Only the contracting officer has the authority to direct, revise, or otherwise change the requirements of the subject contract.

The TPOC(s) will be identified via a separate letter and may be changed at any time by the Government via letter without prior notice to the contractor.

PERFORMANCE REQUIREMENTS SUMMARY (PRS)

PRS items shall be reflected in features and user stories developed as part of the EPIC Scaled Agile Framework (SAFe) process.

The following incentives/remedies apply to all performance objectives listed below.

Incentive: Timely payment and potential for exercising option periods
Remedy: Withholding of invoice until rectified and/or negative past performance rating

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
A PMP featuring a consistent project management approach that prioritizes strategic goals.	4.1.1	● In accordance with the Project Management Book of Knowledge (PMBOK), Seventh Edition, ● Integrates priorities across Agile Teams, Train Leads, Business Owners and Stakeholders, ● Ensures a high-rate of objectives completion and achieving high-levels of business value. ● Provide specific requirements for this task order consistent with the PWS and free of misspellings and grammatical errors. ● Quality Review of the document prior to submission. ● Align with the EPIC contract PMP and 5-year strategic plan. ● Follow template approved by the EPIC Program Team (EPT) and used in previous contract task orders. ● A milestone table is created that outlines all of the requirements and a timeline of when they are expected to be delivered. ● The milestone table is to be created within Jira to be maintained as the baseline, and is updated regularly whenever there are timeline changes. ● Outlines how PWS tasks and requirements are incorporated into Jira, decomposed down into features, objectives, and stories, and how evidence of meeting the requirements flows back up to the features. ● Outlines how features will be prioritized into each PI with a weighing scale (Weighted	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
		Shortest Job First (WSJF) or other) utilizing inputs from the EPT and key stakeholders. ● Each PI should cover roughly 25% of the scope to allow for full scope completion by the end of the Task Order. ● Levels of business value delivered are expected at the 80% rate or above by the end of the POP, and preferably at the end of every PI.	
Review and revise the existing transition-out plan to ensure smooth transition of all contract activities back to the government	4.1.2	● Following the transition-out approach outlined in the transition out plan submitted under TO1 entitled "EPIC-TOP-001_EPIC_Transition_Out_Plan.pdf" ● Ensure end-to-end inventory of all EPIC contract activities from TO1-TO9.	100% inspection
Execute transition-out activities in accordance with the approved transition-out plan in 4.1.2	4.1.3	● Item by item transition following the approved transition-out plan in 4.1.2.	100% inspection
A continuous integration and continuous delivery (CI/CD) pipeline on EPIC supported platforms and/or software infrastructure .	4.2.1	● Provide a plan to transition from a hardware platform centric UFS testing framework to a containerization based testing framework. As part of the plan: ○ Provide a list of at least five Tier-1 platforms and required software stack deployment supported by the EPIC contract; ○ Document as a strategy of providing appropriate containers to mimic corresponding	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
		Tier-1 platforms and plan to consolidate the UFS testing framework on selected compute platforms; ○ Include a plan to update the RT framework to be compatible with the proposed containerization approach. ● Ensure that the UFS WM and supported UFS Apps are updated with patches or containers following the transition plan ● Associated containers are released and documented in UFS and/or EPIC github repos as appropriate. ● Ensure that the UFS WM platform agnostic code is built and tested automatically using the approach as identified in the transition plan. ● Integrated and consistent with NOAA Information Technology Requirements. ● Pipeline is consistent with NOAA R2O2R and transition to operations (T2O) approach ● Ensuring community innovations do not disrupt or slow down NOAA operations processes. ● Operational prototypes are consistent with NCEP Central Operations (NCO) High Performance Computing Implementation Standards. ● Creates interfaces for absorbing scientific innovation provided by the community towards improving the UFS WM and	

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
		applications. ● Provides a capability to assess the performance of new developments relative to NOAA's operational codes. ● Provides recommendations when public releases are looking to innovate and can sync up with operational codes. ● Provides a flexible architecture to facilitate testing new system architectural innovation. ● CI/CD pipeline is tested on tier-1 platforms. ● CI/CD pipeline tools have the same functionality as the current UFS WM and compatible performance integrate stages and gates indicating readiness levels of innovations and identifying operational readiness, consistent with NOAA R2O2R and I2O guidelines. ● Documentation includes full technical description, benchmarking results and relevant metrics across HPC resources. ● Pipeline checks expected subcomponent versions in the model code are used. ● Builds a UFS WM executable stand-alone and several executables simultaneously in RT. ● Runs single, multiple or full RTs. ● Runs code quality tests (e.g. ORT) for new feature tests.	

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
An automated build and build-testing framework for the UFS WM and supported applications including containers, and using spack-stack as the package management system for the UFS, approved by the UFS System Architecture Working Group.	4.2.2	● Provide a staffing plan to co-develop spack-stack in coordination with the joint EMC/NRL/EPIC/JCSDA spackstack team; ● Continuously update and support deployment of up-to-date, platform-agnostic spack-stack, UFS WM, Apps and configurations consistent with the UFS testing framework in 4.2.1 to enable: ○ Automatic building of specified libraries and dependent libraries in spack-stack. ○ Automatic building spack-stack with specified compiler/MPI versions. ○ Automatic testing with updated spack-stack libraries in UFS WM. ○ Codes are on open-source code repositories. ● Ensure consistency with compilers that support community development work and transitions to operational applications. ● Address requirements for data dependencies. ● Support the HSD framework as appropriate.	100% inspection
Operational and development cloud sandboxes as part of the NOAA enterprise cloud environment that are enhanced with the platform agnostic software infrastructure as code for ECP, UFS deployment,	4.2.3	● Continuously supporting the cloud sandboxes within NOAA3000 boundary for EPIC operation and development; ● Continuously updated EPIC Workload Baselines in coordination with the OAR ITMO team in compliance with NOAA IT requirements; ● Utilization alarms shall be set to avoid exceeding a cost	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
including internal- and external-facing configurations.		threshold of $6,000/month; ● Sandbox is supported and functional throughout the lifetime of this task order. ● Migrate the development tools off the existing sandboxes to new cloud environments made available by the government as necessary.	
An improved UFS-WM software process enabling UFS-WM, components and Apps including unit testing, libraries and enforceable code quality control mechanisms.	4.2.4	● A plan toward improving the UFS-WM software process to shift from submodules to libraries in the UFS-WM with clearly articulated roles and responsibilities for the EPIC team developed in collaboration with the UFS System Architecture and Infrastructure Cross-Cutting team by the end of the first PI in the POP. The plan shall ○ Ensure properly testing of any new libraries in the UFS-WM CI/CD pipeline; ○ Ensure smooth transition from submodules to libraries using a sound code/configuration approach. ○ Corresponding code management documents are kept up to date. ● Support the such transition for one MVP that is consistent with the plan above.	100% inspection
A modeling infrastructure for consolidating the hierarchical system development (HSD)	4.2.5	● Includes updated scientific validated cases selected in collaboration with stakeholders. ● Includes testing capabilities and a public facing interface	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
framework, with appropriate testing capabilities and a public facing interface containing technical documentation and entry points for enabling community discussions and collaborations.		containing technical documentation ● Includes entry points for enabling community discussions and collaborations. ● Consolidates the hierarchical system development (HSD) framework with appropriate testing capabilities ● Contains a public facing interface with technical documentation and entry points for enabling community discussions and collaborations. ● Support users guide release, including software features and documentation for supported platforms ● Ensure connection and proper documentation of preprocessing scripts or code (e.g., for idealized cases), verification and validation packages/tools, and visualization of outputs, mimicking components in the WRF Tutorial ● Document the process for supported platforms and continuously made available on a wiki page. ● Work closely with the UFS Communication, Education, and Outreach Working Group and EPT to collect inputs from key stakeholders, including NWS, NOAA Labs and members of the Weather Enterprise, to extend HSD and allow keeping pace with case studies relevant for community users, and to advocate the HSD capabilities .	

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
Coordinate and support the code and repository management of the UFS WM and UFS Apps and configurations.	4.3.1	● Coordinate code integration and porting to supported platforms of UFS WM and Apps and configurations consistent with sub-components. ● Consistent with refactoring efforts and aligned with the use of UFS libraries on relevant HPC systems and./or containers; ● Supporting the containerization and continuous development of spack-stack ● Support code management meetings for the UFS WM and all relevant UFS Apps within scope of the EPIC Program. ● Ensure that the schedule of code integration follows priorities of UFS apps and subcomponents. ● Communicate status to app managers in UFS application team meetings. ● Review/track UFS WM PRs daily, identify issues/conflicts, and work with developers to ensure PRs are addressed. ● Evaluate/coordinate new software/libraries/input data in the UFS WM, discuss with developers and SMEs impacts to operations. ● Coordinate subcomponent repository updates ensuring submodules are synced with authoritative repositories every two weeks. ● Continuously coordinate UFS WM testing for software releases including system, dependent libraries and subcomponents. ● Review and identify UFS WM	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
		every two weeks to ensure the testing framework reflects latest development and code changes in different applications. ● Develop plans to improve the UFS WM testing framework to run tests efficiently and ensure code quality prior to every UFS WM and application release. ● Continuously coordinate model code changes with workflow and downstream applications. ● Align efforts to facilitate the integration of novel UFS WM or UFS App capabilities including additional dynamic cores (dycores), such as the Model for Prediction Across Scales (MPAS) as appropriate. ● Provide and archive meeting minutes, updated within 48h following every code management meeting. ● Support developers on syncing/merging branches, run UFS WM RT (or ORT) on the supported platforms or in containers consistent with the transition plan in 4.2.1, monitor and resolve testing, debugging performance issues. ● Maintain UFS WM RT, CI, and ORT tests, input data and baselines on HPC resources.	
Support for the seamless integration of the EPIC code and repository management environment.	4.3.2	● Ensure that applications connect to the individual component models after changes are made to the application code repository. ● Document dependencies of application repos on individual components on confluence as well as on GitHub repo wikis. ● Ensure that as components get	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
		upgraded, applications are tested with every upgrade so that component code changes do not break the system across the different Tier-1 platforms. ● Benchmark retrospectives demonstrate if new developments are not degrading accepted operational forecast skill and computational performance. ● New features introduced in component repositories meet implementation standards. ● New features are thoroughly tested using available operational workflows. ● Including a tracking system, wiki and user support to the code management tool used by community developers within the framework of the UFS.	
Coordinate the Continuous Integration Teams to support the UFS WM and UFS Apps.	4.3.3	● CI teams must be established within one month after support to a new app begins as part of CI team daily activities: ● Ensure requirements of the integrated EPIC code and repository management environment are met. ● Maintain regression, cross platform and integration tests. ● Enhance the regression test framework with new features. ● Integrate new model functional tests into the regression test framework. ● Continue to support Tier-1 platforms or in containers consistent with the transition plan in 4.2.1; ● Update supported compiler version as appropriate. ● Coordinate regression testing	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
		amongst the various members of the team. ● Ensure latest results of regression tests are captured within the UFS model repositories. ● Develop activities in collaboration with key stakeholders. ● Work with component code managers to test upcoming features and alpha/beta releases of the components. ● Investigate regression test failure. ● Make code updates when/where necessary. ● Verify and validate test results. ● Create new baselines for expected answer changes. ● Track down unexpected answer changes. ● Ensure computational performance is maintained through communication with component managers on a regular basis. ● Archive meeting minutes and notes with availability to the EPT and community.	
Support the development of the CICE component in the UFS WM.	4.3.4	● Including design, code and repository management and continuous integration, development and documentation of CICE component software, development practices and processes. ● Develop model run and test scripts, testing strategy, and test implementation including ability to provide continuous integration and development for the UFS community.	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
		● Provide software engineering support to CICE and Icepack code separation and interfaces. ● Help review and validate proposed model source code changes. ● Evaluate and help optimize model porting and performance EPIC supported platforms or containers consistent with the transition plan in 4.2.1. ● Provide broad oversight of the code to ensure compatibility and software best practices, and software consulting support for team members in coordination with the UFS code management team. ● Develop documentation following standards and requirements applicable to the UFS WM and applications.	
Support the UFS Stochastic Physics team in their code repository management activities.	4.3.5	● GitHub actions in place that checks for documentation for future PRs. ● Documentation is up to date reflecting all capabilities in the physics repository. ● Work with key stakeholders to ensure that proper logging of test results is being done by the GitHub actions. ● Testing is automated and executed with each PR. Minimizes manual testing that has to be done by the code managers. ● Updated the established CI/CD pipeline as appropriate.	100% inspection
A data management framework for findable, accessible, interoperable, and	4.3.6	● Consistent with the NOAA Public Access to Research Results (PARR) plan (https://repository.library.noaa.g	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
reusable data.		ov/view/noaa/10169) ● updating the current procedures and infrastructures accordingly, in support of the UFS community data needs for development, testing, and evaluation of the UFS WM, UFS Apps, data assimilation systems, and post-processing. ● Maintain a database available for download, or being staged, containing data for UFS WM, UFS Apps and components for running relevant test cases, including representative forecast runs and leveraging the already-existing UFS Case Studies Platform. ● Datasets supporting UFS Apps must be updated as part of code releases. ● Observational datasets available using conventional and satellite observations available from sources such as NCEP/NOMADS/NCEI operational and research archives for relevant weather and oceanographic events. ● Appropriate BCs, ICs prepared on cloud and on-premise HPC platforms. ● Datasets prepared matching test cases appropriate for case studies and updated reflecting needs of UFS App releases. ● Data pipeline established by engaging the appropriate POCs from data source organizations. ● Datasets are available in a public repository in the cloud. ● Datasets are accessible via the EPIC Community Portal. ● Documentation describing data,	

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
		formats and applications is provided. ● Continuously update a unified data mapping framework that ensures dependent data in the cloud is available for processing by UFS WMs running in the cloud and on-premise HPC platforms: ● Includes data mapping algorithms to facilitate the data management. ● The requirements are Findability, Accessibility, Interoperability, and Reuse of the data. ● Ensures availability and easy access to relevant observational dataset with appropriate BCs, ICs on cloud formats readable on on-premise HPC resources. ● Framework ensures datasets are available in a public repository in the cloud. ● Framework ensures datasets are accessible via the EPIC Community Portal. ● Framework includes documentation describing data, formats and applications.	
Updated UFS application software governance, system architecture and infrastructure document.	4.4.1	● In coordination and for review with the UFS System architecture and infrastructure Cross-Cutting Team. ● Provides a consistent approach for reviewing and integrating pull requests into relevant authoritative repositories. ● Include all components such as atmospheric model, pre-processing, physics, post processing and workflow. ● Includes the necessary initial conditions (ICs), lateral	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
		boundary conditions (LBCs). ● Includes necessary dependent data provided by NOAA to support research and development of the UFS Apps on Cloud Platforms (e.g., AWS, Google and Azure). ● The number and priority of each prototype shall be developed in coordination with the UFS Application Teams. ● Consistent with the SRW-RRFS Convergence Tiger Team report. ● Consistent with EMC-EPIC collaboration agreement on global-workflow support and co-development ● Provide a plan to upgrade the UFS Land DA System to the UFS Community DA System, with clearly identified JCB configurations (e.g., extends to Sea-ice and Ocean Coupled Analysis); ● Consistent with the UWF Integration Plans as appropriate. ● Allow research and development workflow and test infrastructure to be included. ● Integrated with continuous integration and continuous deployment pipelines on Tier-1 platforms or containers consistent with the transition plan in 4.2.1. ● Facilitate the integration of additional dynamic cores (dycores), such as the Model for Prediction Across Scales (MPAS), to JEDI-based applications. ● Ensure joint governance with active participation of EPIC,	

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
		UFS Applications, and NCO Team. ● Ensure alignment with priorities of the Consortium for Advanced Data Assimilation Research and Education (CADRE). ● Establish a mechanism to interact with community developers to discuss upcoming PRs and testing results. ● Portable across on-prem and cloud platforms. ● Properly documented following standards/structure of the UFS-WM and apps and components, such as WM, SRW, UFS Community DA System user's guide. ● Aligned with the UFS System Architecture and Software Governance.	
Coordinate reviews and integrate pull requests into the authoritative repositories based on the UFS Application Software Governance Document.	4.4.2	● Coordinate code integration and porting to supported platforms of UFS Apps and configurations consistent with sub-components, ● Support code management meetings for the UFS SRW and LandDA App at the minimum. ● Support the UFS Global App code management meetings if necessary. ● Follow the approved UFS application system architecture and infrastructure document and UFS Application Software Governance. ● Communicate status to app managers in UFS application team meetings. ● Coordinate subcomponent repository updates ensuring submodules are synced with authoritative repositories every two weeks. ● Continuously coordinate model code changes with workflow and	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
		downstream applications. Provide and archive meeting minutes, updated within 48h following every code management meeting. ● Support developers on syncing/merging branches, run ORT on the supported tier-1 platforms, monitor and resolve testing, debugging performance issues. ● Maintain ORT tests, input data and baselines on EPIC supported Tier-1 platforms. ● Assist community developers with code commits into UFS repositories. ● Assist community developers to determine which tests need to be run (besides minimal set of WE2E tests).	
A minimal set of workflow end-to-end (WE2E) tests in each authoritative repository for supported applications.	4.4.3	● Follow the approved WE2E plan for each supported app or configurations. ● Add new WE2E tests as needed for new features. ● Consistent Application pipeline with GitHub Actions and Jenkins.	100% inspection
Verification and validation metrics integrated into each application for selected cases.	4.4.4	● Provide a plan to enable a workflow to integrate postprocessing utilities, verification and validation metrics, and visualization packages to an EPIC forecast skill dashboard with an external web interface on EPIC website ● The workflow shall allow side-by-side comparison of outputs from physically based vs data-driven numerical weather prediction models, including deterministic runs and ensembles. ● App documentation shall include step-by-step	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
		instructions to customize the V&V workflow using at least case study as an example. ● Case selection is made in coordination with the application teams for supported applications.	
Improved components of supported applications with enhanced DA, preprocessing, postprocessing, and verification and validation capabilities.	4.4.5	● Create a plan with workflow elements or features in components that require improvement identified in coordination with key stakeholders for each supported App. ● Improvements submitted as PRs to the corresponding application repo or cross-cutting repos (e.g., DA, UWF). ● Ensure alignment with priorities of the Consortium for Advanced Data Assimilation Research and Education (CADRE). ● Documentation and wiki pages updated to reflect improvements.	100% inspection
Computational performance benchmarks of end-to-end configurations for at least one prototype of each application on selected Tier-1 platforms.	4.4.6	● Create a benchmarking plan with the configurations and prototype identified in coordination with key stakeholders for each supported App; ● Conduct the benchmarking of each app on selected Tier-1 platforms pending EPT approval. ● The benchmark results are advertised to the broadest extent to highlight what the current capability is.	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
At least one optimized prototype for each application with documentation.	4.4.7	• Updated documentation with all integrated features in 4.4.3 – 4.4.5 linked to UFS document databases (Application Documentation github rep, wiki pages). • Prototype codes are on open-source code repositories. • Include compilers that support community development work and transitions to operational applications • Address requirements for data dependencies. • Provide user-friendly evaluation tools, work datasets and documentation.	100% inspection
A community AI-modeling backbone or framework that efficiently trains AI models on selected hardware platforms available to NOAA.	4.5.1	• Adopt Anemoi framework to work on NOAA-accessible hardware platforms such as DOE computers, RDHPC Ursa, and on the Cloud Providers. • In collaboration with NOAA scientists, apply this framework to train and validate models that incorporate external (e.g., ERA5, CONUS404) and internal NOAA (e.g., GDAS and HRRR analyses and the UFS replay) datasets. • Include datasets of interest into the training pipeline. • Train and validate global AI models using the supported Anemoi framework. • Establish a data management framework addressing the needs of this effort, • AI framework shall allow addressing needs of users from a broad range of expertise and computer resource availability levels (e.g., reduced resolution and/or cadence configurations).	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
		• Develop code management, CI testing, and training artifact recording infrastructure for the Anemoi-based models. • Advance Anemoi framework to support NOAA and US centric requirements. • Establish pipelines to support the AI framework and verification. • Support public-facing github repositories with the developed framework. • Conduct unit and regression testing where appropriate • Coordinate PR review, integration and merging into either authoritative ECMWF repository or into the NOAA/EPIC fork of the repository. • Benchmarking training and performance assessment on selected platforms. • Allow users to adapt the trained outcomes to additional custom datasets wherever possible. • Establish a leadership team composed of EPIC, NCEP and NOAA Lab members for high-level decision making and setting roles and responsibilities. • Update the SOP or white paper outlining processes, procedures, roles and responsibilities, wherever applicable.	
A near-realtime workflow co-developed with the NOAA AI4NWP team that allows for deployment of deterministic and	4.5.2	• Key stakeholders and their requirements are properly recorded in associated online artifacts. • Develop and implement WE2E tests for the global AI model based on key stakeholder	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
ensemble-based configurations of the global AI models.		inputs. ● Integrate verification and validation package based on key stakeholder inputs. ● Include preprocessing, postprocessing and visualization tools. ● Leveraging the UFS cross-cutting tools (e.g., EPIC data management framework, UWF toolkit, UFS ARCO, UPP, MetPlus) ● Leverages the UWF toolkit. ● Documentation follows format and standards developed in collaboration with the UFS community ● Develop a flexible workflow that allows rapid inclusion of NOAA-developed and external AI models into the framework.	
An AI online portal that will provide capability for near real time forecasts and verification of the AI models developed in 4.5.1.	4.5.3	● Develop a public-facing portal for the EAGLE-AI global ensemble and deterministic forecasts. ● Support the continuous updates of the AI blog webpage. ● Perform a suite of ensemble forecasts in the near real time environment based on GFS/GEFS initial conditions. ● Verification is provided against operational GEFS and community-developed AI models ● Work with the EAGLE-AI and AI4NWP groups to determine a scientifically valid configuration of these forecasts. ● Deploy automated evaluation and validation of the natively developed AI forecasts and AI forecasts developed by the external community against a	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
		NOAA-defined score card. Work with EAGLE-AI and AI4NWP groups to define this score card. ● Consistent with activities in items 4.5.1 and 4.5.2 in this PWS. ● In coordination with related activities undertaken by the WiW stakeholder group.	
An updated UFS Release Coordination Vision document and Release Coordination CCT Charter.	4.6.1	● Incorporate perspectives of HSD frameworks from the EPIC team and key stakeholders. ● Incorporate perspectives of UFS Global App from key stakeholders and UFS community (e.g., the global-workflow team, UFS GFS/GEFS/SFS Team). ● Collect inputs from the UFS Steering Committee co-chairs and other key stakeholders identified by the UFS Steering Committee co-chairs.	100% inspection
Support of release coordination efforts based on the approved vision and charter.	4.6.2	● Follow the approved UFS Release Coordination Vision and Release Coordination CCT Charter from 4.6.1.	100% inspection
Capability announcements supporting relevant UFS-WM components and Apps.	4.6.3	● Capability announcements are made reflecting program and community priorities of UFS-WM components and Apps UFS including, but not limited, to the HSD framework, the UFS SRW App, the UFS Community DA System, and the UFS Global Apps. ● Coordinate with the JEDI Configuration Builder (JCB) team to identify suitable JCB configurations for UFS	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
		community DA system capability announcements. ● Consistent with UFS Public Release Plans. ● Release plan indicates clearly key stakeholders for each release. ● Release plans are made available and easily accessible to relevant key stakeholders. ● Establish a SOP for releasing reanalysis data from selected modeling centers (e.g., ECMWF or NCEP) as the meteorological driver, if appropriate. ● Deploy final platform-agnostic containerized versions of the UFS WM and relevant components and applications, where appropriate. ● Code is on open-source code repositories and runs consistently in on-premise, cloud, and limited testing environments. ● Container has all necessary infrastructure for ensuring UFS WM and App codes are properly built for applications being rolled out. ● Consistent with compilers that support community development work and transitions to operational applications. ● Address requirements for data dependencies associated with running regression and usability tests and case studies. ● Provide user-friendly evaluation tools, work datasets and documentation integrated with each public UFS App release.	

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
		• Develop a finalized minimal set of workflow end-to-end (WE2E) tests for each PR submitted into the UFS WM and relevant applications consistent with CI/CD pipeline, • Collaborate with community developers to determine which tests need to be run (besides minimal set of WE2E tests). • Add new WE2E tests as needed for new features. • Evaluate whether unit tests are needed for PRs. • Using automation server and testing approaches consistent with the UFS community framework. • Documentation is updated reflecting new features added to the UFS WM repository as pertains to the UFS-WM based Capability Announcements and releases. • Documentation follows format and standards developed in collaboration with the UFS community.	
Releases of EAGLE-AI and the UFS Global Apps (e.g., GFS, GEFS, or SFS)	4.6.4	• Consistent with the framework proposed in 4.5. • Consistent with the EAGLE-AI development plan • Leveraging the UFS cross-cutting tools (e.g., EPIC data management framework, UWF toolkit, UFS ARCO, UPP, MetPlus) • Leverages the UWF toolkit. • Documentation follows format and standards developed in collaboration with the UFS community • Consistent with a flexible workflow that allows rapid	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
		inclusion of NOAA-developed and external AI models into the framework.	
Coordinate and continuously manage user support forums integrated to the ECP.	4.7.1	● Engage the community engagement team to ensure seamless integration to the ECP. Ensure consistency with DTC and UFS community needs. ● Ensures continuity of existing UFS forums. ● Monitor daily forum postings from the community and provide technical advice engaging appropriate SME's. ● In collaboration with UFS working groups, develop a list of SMEs for the various UFS components and applications. ● Provide answers or contact UFS SMEs for support within a reasonable time frame (eg, 48 hours). ● Document a support team with subject matter expertise to provide answers reducing dependency on SMEs. ● Provide an SOP for activities within the PoP of this task order. ● Provide tutorials for UFS developers in code management, continuous integration, and DevOps in forms of wiki pages linked to EPIC supported GitHub repositories (i.e., UFS-WM, SRW,, UWF,, Community DA System, Global App), videos, and training workshops. Submit a plan to address this requirement in the second sprint of the PoP.	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
Co-develop and provide technical and logistic support to the Hackathon .	4.7.2	● Work with the EPT and selected members from the NOAA AI4NWP team to co-design the Hackathon. ● The Contractor shall provide a suitable space (virtual or in-person) for up to 50 people and approved by the NOAA Program Manager prior to scheduling. ● Provide pre-event coordination efforts such as agenda development, development of marketing materials, and technical instructions as needed. ● Provide staff support for execution. ● Advertise events broadly via various communications channels following a mutually agreed upon rollout plan. ● Align with PI development efforts. ● Contents are reviewed by technical and non-technical teams to ensure quality and accessibility. ● Non-disclosure agreement signed as necessary.	100% inspection
Technical support to the development of tutorials and instructional materials dedicated to community modeling in Earth sciences, understanding, running and developing the UFS.	4.7.3	● Accessible to users of all backgrounds and levels of expertise. ● Develop requirements reflecting needs of EPIC and UFS communities. ● Videos follow all accessibility standards (i.e., 508 compliance, subtitles). ● Video content is updated, as needed within an agreed mutually timeframe, to reflect changing content. ● Provide technical support to developing content for tutorials, engaging with the community engagement teams. ● Ensure technical details of all tutorials are accurate. ● Ensure that tutorials involving code build and running case studies are fully functional and	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
		ready for cloud and supported on-premise platforms. ● Provide technical support to developing content relevant to the success of the EPIC program, including EPIC processes and CI/CD pipeline, community code development, testing. ● Align development of tutorials and instructional materials with the EPIC educational programs coordinated by EPT, such as the UFS faculty and student ambassador programs. ● Outreach materials in this task are made available via the ECP. ● Contents are reviewed by technical and non-technical teams to ensure quality and accessibility.	
Documentation supporting the UFS WM relevant UFS Apps.	4.7.4	● Documentation is updated reflecting new features added to the UFS WM repository. ● Documentation follows format and standards developed in collaboration with the UFS community. ● Support applications and components including WM, SRW, UWF and Community DA System, and Global App. ● Documentation is accessible via public engagement resources, including contents, links and guidance in the ECP, GitHub wikis and relevant resources, in coordination with the UFS release coordination working group.	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
Continuous support for interfaces that allow users seamless access to EPIC and UFS repositories, wikis, ticketing services, and documentation through the ECP.	4.7.5	● Engage the ECE team to identify dependencies and ensure all relevant interfaces, outcomes, and products are displayed and integrated with the website. ● Seamless integration to EPIC and UFS community repositories. ● EPIC wiki frameworks are fully integrated with existing UFS community wikis. ● Infrastructure ensures the ticketing system is functional and integrated into the community reporting framework. ● Interfaces are accessible via public engagement resources, including contents, links and guidance in the ECP, GitHub wikis and relevant resources, in coordination with the UFS release coordination working group.	100% inspection
Continuous support for a set of community modeling user forums integrated with GitHub discussions for UFS WM and EPIC supported applications and configurations.	4.7.6	● Forums exist at GitHub wikis for UFS Community, UFS WM, UPP, SRW, Community DA System. ● Establish a forum for UFS Global Apps. ● New Forums deployed for upcoming UFS WM, Apps and configurations to be supported under this Task Order. ● Forum is reviewed for updates according to existing SOP. ● Forums are integrated into the ECP. ● Assist in coordinating user support for the UFS GitHub forums and issues, in conjunction with EMC.	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
Continuous support for the EPIC interface providing selected users access to a cloud-based sandbox for testing of innovations, attending workshops and learning events, and changes to the UFS models.	4.7.7	● Documentation is provided describing Interface allowing sandbox access. ● Documentation is provided describing user access controls. ● All documentation is ensured to be made available using appropriate resources. ● User support is available to ensure access is successful ahead of workshops and events.	100% inspection
Continuous support for the EPIC Community Portal (ECP).	4.8.1	● Portal includes dashboards with metrics, integration to the community (E.g., GitHub) tools, to community forums, to ticketing systems, and sandbox access. ● Includes interfaces for user access to GitHub code repositories, integrated access to EPIC and UFS GitHub wikis, ticketing/issues, user forums, and access to a user sandbox when applicable. ● Portal follows responsive design and 508 compliance. ● Portal follows human-centered design best practices. ● Portal is Search-Engine Optimized (SEO). ● Portal follows style guidelines. ● Portal addresses requirements of this task order as indicated in other PWS items and their respective requirements. (Verified only during the final PI in the PoP after all other items are accepted).	100% inspection
Plans and roll out schedules for maintenance, design and content updates of the ECP and other	4.8.2	● Reflecting user feedback and technology needs and opportunities. ● Content approvals follow the EPIC Website Standard	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
communication tools.		Operating Procedures. ● Contract and program teams are continuously engaged to post outcomes and relevant work items on the EPIC website. ● At a frequency to be determined, or as requested, provide content updates to relevant website pages to ensure accurate information is available. ● Communicate publicly-relevant contract, project, and program information to the community via the EPIC site. ● Create opportunities for active engagement by encouraging conscious actions of sharing information, comment, challenge, fact check, or engage in activities relevant to EPIC and the UFS. ● Obtain regular feedback from community members.	
Continuous support for all the capabilities currently implemented on the EPIC website, and new capabilities added to the ECP.	4.8.3	● Roll out user tests to ensure that the EPIC website is up to date and fulfilling its function to create engagement. ● Identify current EPIC website capabilities and integrate them constructively to become the ECP.	100% inspection
Host the 2025 Unifying Innovations in Forecasting Capabilities Workshop (UIFCW).	4.8.4	● Pre-workshop, coordinate all planning and deployment steps including health, safety, and other requirements, registration, event branding, marketing, agenda development, speaker coordination, and other duties as identified by the TPOC or planning committee members. ● During the event, provide staff support to execute the event	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
		including in-person and virtual coordination and other staff support roles as identified by the lead planner. ● Post-event, ensure community coordination and communications of recommendations, outcomes, and findings through various media, contribute to a workshop report. ● Provide relevant materials and supplies such as printing, IT equipment, and other materials as identified by the lead organizer and planning committee.	
Plan the 2026 Unifying Innovations in Forecasting Capabilities Workshop.	4.8.5	● Include preparation efforts to ensure the workshop or short-course is hosted in the following calendar year. ● Provide pre-event coordination efforts such as agenda development, development of marketing materials, coursework, and other materials; as needed. ● Provide staff support for workshop execution. Advertise the event broadly via various communications channels.	100% inspection
Co-host two workshops in coordination with selected UFS teams.	4.8.6	● Details to be determined in agreement between the PO and contractor by the end of the first PI of this TO. ● Training should provide focus on SRW developers, which should be mandatory for stakeholders directly contributing to the UFS code repo. ● Training should seek supporting DA consortium focused on	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
		developers. ● Include preparation efforts e.g. timely registration with AMS, to ensure the workshop or short-course is hosted in the following year. ● Include preparation efforts for the annual summer workshop. ● Provide pre-event coordination efforts such as agenda development, development of marketing materials, coursework, and other materials; as needed. ● Provide staff support for workshop execution. Advertise the event broadly via various communications channels.	
Continuous development of content and updates for social media needs of the EPIC program.	4.8.7	● As determined through PI planning and documented in the communications plan, provide content updates to the EPIC social media accounts, including X, Meta, and LinkedIn. ● All content shared follows identified operating procedures and NOAA policies as specified in the NOAA Social Media Handbook. ● Ensure appropriate approvals are obtained per the SOP.	100% inspection
A continuously updated communications strategy document.	4.8.8	● Participation in scheduled UFS Communications & Outreach WG meetings. ● Participation in scheduled UFS Steering Community Meetings. ● Goals, outcomes, and metrics are communicated broadly to the community. ● Strategy aligns UFS Governance and Structure. Previous plans and documents	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
		owned by the Program Team shall be updated to remain current. ● Updates are consistent and aligned with the UFS Communications, Education and Outreach (CEO) working group strategy as necessary. ● Identify goals, outcomes, and metrics to measure the success of communications efforts. ● Rollout plans are created for each release and workshops in collaboration with the EPT. ● Seek approval from Raytheon and NOAA TPOCs for community engagement activities that require more than 16 work-hours/event, with a statement to demonstrate the business value following the established SOP.	
Continuously updated and expanded frequently-asked questions pages.	4.8.9	● Provide technical support to developing content for tutorials, partnering with the community engagement team. ● Integrated to user forums. ● Includes lessons learned from EPIC contractors and UFS community users and developers. ● After a discussion is closed out, it is reviewed for the FAQs and if desired, added within one sprint. Performed in coordination with EPIC Agile teams and EPT.	100% inspection
Scientific and technical presentations in relevant conferences and workshops.	4.8.10	● Submit at least two abstracts for 2025 AGU Fall Meeting and at least five abstracts for AMS 106 Annual Meeting ● Participate in EPIC related presentations at NOAA or	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
		Raytheon Booth ● Submit abstracts for EPT review one week before conference/workshop deadlines; ● Submit presentation slides/posters one week before the conference/workshop; ● Ensure that travel cost is within the requested travel budget of the TO	
Develop and publish a newsletter promoting community and stakeholder engagement.	4.8.11	● Solicit and curate UFS-related newsletter content following recommendations and needs from the UFS Community. ● Solicit content on UFS-related achievements, upcoming events for EPIC and the UFS, success stories from EPIC and UFS-related activities, and other approved content as capacity allows. ● EPIC provided articles are a minimum of 2 per newsletter. Note that UFS content is received externally from the UFS community ● Ensure the newsletter follows responsive design, Human-centered design best practices, SEO best practices, Section 508 compliance, and established style guidelines. ● Distributed using Social Media, Relevant websites, and Email list including members and organizations in the weather enterprise.	100% inspection
A continuously-updated framework that integrates EPIC key stakeholder engagement needs.	4.9.1	● Conduct quarterly stakeholder engagement analysis activity to identify key stakeholders and key stakeholder groups. ● Key stakeholders should not be required to have background	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
		knowledge of program management practices for the purpose of engaging on specific work items. ● Communications and information display interfaces should be accessible to all key stakeholders. ● Improve engagement of key stakeholders as evidenced by increases in participation of EPIC hosted events and UFS code commits. ● Provide tracking metrics for all stakeholder categories.	
Continuous key stakeholder engagement and opportunities for incorporating stakeholder feedback into relevant work items.	4.9.2	● Quarterly Meeting held with Key stakeholders, with a focus on soliciting future priorities that can inform follow on Task Order work. ● Key stakeholder feedback has been incorporated into vision and work items. ● Key stakeholders are identified and invited to the event with at least three weeks' notice. ● Engaging stakeholders without knowledge of the SAFe process with user-friendly and basic concepts into the SAFe process being used for EPIC. ● Quarterly meetings are aligned with the semi-annual reviews.	100% inspection
A continuously-updated key stakeholder database.	4.9.3	● Stakeholder database updated quarterly ahead of engagement activities prior to SAFe PI planning events. ● Consult with existing stakeholders and community members to ensure updates reflect needs.	100% inspection

Required Service	PWS Section	Performance Standard	Method(s) of Surveillance
Continuous assessment of key stakeholder priorities and its integration to EPIC feature and user stories backlogs.	4.9.4	● Key stakeholder feedback has been incorporated into vision and work items in each program increment. ● Key stakeholder priorities are provided to contract personnel in a central location.	100% inspection