NATIONAL WEATHER SERVICE INSTRUCTION 01-1003

OCTOBER 31, 2022

Administration and Management

Managing the Provision of Environmental Information, NWSPD 1-10

PROVISION OF ENVIRONMENTAL INFORMATION SERVICES SUPPORTING MOBILE DEVICES

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SUMMARY OF REVISIONS: This directive supersedes National Weather Service Instruction NWSI 1-1003, "Provision of Environmental Information Services Supporting Mobile Devices," dated April 16, 2012. Changes include:

- Sections 4 and 5 changed to reflect the NWS Headquarters Reorganization effective April 1, 2015 and current NWS Governance processes;
- Section 2.1 updated to reflect current definition of NWS core partner;
- Added definition of Weather, Water, Climate Enterprise and replaced "weather industry" references with references to private sector Enterprise partners, to reflect current usage of terms;
- Definition of "NWS Core Partner" in Appendix A has been replaced with a reference to the current definition in NWSI 10-24;
- Reformatted section numbering to conform to NWSI 1-101 requirements.

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NWS Chief Operating Officer

Provision of Environmental Information Supporting Mobile Devices

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1 Introduction

Over the past three decades, wireless communication technology and the prevalent use of mobile devices has changed the way people communicate and share information on a day to day basis. As of 2021, 88% of Americans have smartphones (source). American Customer Satisfaction Index (ACSI) surveys of the National Weather Service (NWS) show that smartphones continue to be the general public's most preferred source for weather information. The ACSI surveys show that twice as many people prefer to get weather information on their smartphone than on their personal computer (Source: NWS ACSI results briefing 2021 Q1/2, Q3/4). The NWS Strategic Plan identifies NWS as an agency responding to the changing ways people communicate, network, and share information, and we are already using new technologies to make information more accessible. Providing environmental information services supporting mobile devices using wireless communication technology has the potential to increase the effectiveness of NWS warnings designed to protect life and property. Moreover, capitalizing on the innovative capabilities of the NWS workforce can help leverage this technology to increase the benefits to

the U.S. As with every new opportunity, there are important factors which must be considered to ensure their effectiveness.

This Instruction does not make a priori decisions regarding which services (e.g., mobile applications) NWS might provide. Rather this Instruction describes a range of approaches to supporting mobile devices in the provision of official NWS content (e.g., official data/forecasts or educational material), and provides process guidelines intended to ensure NWS develops environmental information services using mobile devices in a manner that adheres to appropriate U.S. Government policies and maximizes the effectiveness of the NWS in meeting its core mission.

2 NWS Approach for Providing Environmental Information Services Supporting Mobile Devices

Providing environmental information services supporting mobile devices includes, but is not limited to, mobile-enhanced web content, mobile applications[1] (a.k.a., "apps"), and integration of environmental information into emerging mobile technologies. Any component of the Environmental Information Enterprise[2] (government, private industry[3], and academia) can provide these services to the public. NWS currently provides web content scaled for mobile devices (e.g., NWS point/click forecast pages, mobile.weather.gov) and has developed experimental services which push hazardous weather alerts to a limited set of users (NWS "core partners") via SMS messaging. Private sector Enterprise partners provide a rich array of services including alerts and general weather information tailored to users of mobile devices. Government and academia, too, provide environmental information tailored to mobile devices, to make important data sets available to a wide audience and to explore the utility of new data sets to various user groups, including the general public.

The NWS approach to providing environmental information supporting mobile devices includes both direct and indirect services.

- **Direct services** are those for which NWS provides content suitable for users' specific mobile device and controls its presentation on that device.
- **Indirect services** are NWS support for direct environmental information services serving mobile devices provided by other entities in the environmental information

[1] Within this document, "mobile applications" (also known as native apps or phone/tablet apps) are developed/coded for specific mobile device operating systems (e.g., iOS, Android) and are typically downloaded from an online app store to run on a user's device. Mobile-enhanced web content (also known as mobile web apps) provide display and functionality specific for use on mobile devices, are viewed in a mobile device's web browser (typically not written for specific browsers) and any processing tasks are executed by the server hosting the web content; they don't need to be downloaded and installed on a users' device. See also Appendix A.

[2] Environmental Information "Enterprise" (a.k.a. Weather, Water, and Climate Enterprise) - includes all entities in the public, private, nonprofit, research, and academic sectors that provide information, services, and infrastructure in the areas of weather, water, and climate.

[3] Enterprise partners in the private sector (industry) include all elements of the private sector (including media, consultants, equipment providers, etc.) which provide services to the public in the areas of climate, water, and weather, broadly defined (e.g., includes space weather). The term does not exclude foreign-owned companies which provide services to the American public.

enterprise.

Taking this two-pronged approach ensures NWS is supporting users of mobile devices and optimizes the rapid delivery of critical weather services to emergency managers, electronic media, and other core partners as well as to the public. NWS will coordinate and/or collaborate with Enterprise partners in providing services to support mobile devices, thus optimizing use of Enterprise-wide capabilities and minimizing duplication of effort. This includes partnering with other federal agencies to provide NWS data within their mobile services.

2.1 Support for NWS Core Partners[4]

NWS recognizes that we have a special mission responsibility for our core partners (emergency management community; water resources management community, domestic and international government partners; electronic media). This subset of the NWS user community requires timely information wherever they are, through multiple channels of dissemination, including wireless. NWS needs to know these core partners have access to unaltered NWS data/products to ensure successful interaction between these partners and our field forecasters. In addition, these core partners require tools to facilitate two-way information sharing and decision support[5] with NWS. Consideration for the special needs of this user community will be given in applying the decision process in section 4, below, with the intent of maximizing NWS flexibility in developing mobile services (mobile apps, alerts, web services, etc.) to meet core partner needs promptly.

2.2 Direct Environmental Information Services Supporting Mobile Devices

To ensure responsible use of federal tax dollars, NWS must provide a compelling case for direct provision of environmental information services supporting mobile devices when Enterprise-provided sources are widely available and have features essential to the NWS mission. Factors that support direct provision of NWS environmental information services serving mobile devices include:

- Service is essential to protection of life and property;
- Service is essential for use by NWS employees in performing NWS mission (e.g., internal use);
- Service is essential for use by NWS core partners to access information needed for coordination / collaboration with NWS;
- Service is provided using widely applied standards and with equivalent functionality across multiple vendors' devices, as opposed to methods which depend on proprietary standards or favor use of a particular vendor's device;
- Commercial or other government sources do not provide service, or provide a service that does not have features essential to NWS mission; and
- NWS expects to be able to sustain development and operating costs for NWS to provide the service.
    - Development and operating costs include costs of compliance with relevant policies and may include licensing fees for patents, etc.

[4] See Appendix A for definition of NWS "core partners."

[5] Public Law 115–25 (Weather Research and Forecasting Innovation Act of 2017) directs NWS to increase impact-based decision support services.

a. NWS, to the extent practicable, will design web content to render appropriately on mobile device web browsers. NWS web sites will offer mobile-optimized content, using Mobile Best Practices 1.0 from the World Wide Web Consortium[6] (W3C) at https://www.w3.org/TR/mobile-bp/ . This may include use of adaptable web pages designed to display on multiple device sizes, as well as web content designed specifically for display on mobile devices (e.g., mobile.weather.gov).

b. NWS should update existing NWS environmental information services to support use in a mobile environment, in order to accommodate these mainstream technological capabilities. This includes data visualization on smaller screens or provision of services available to be accessed in a mobile environment.

c. NWS may initiate new direct environmental information services supporting mobile devices using the established NWS development and governance processes, with modifications reflecting potential Enterprise sensitivities, as outlined in section 4, below.

2.3 Indirect Environmental Information Services Supporting Mobile Devices

NWS recognizes that Enterprise partners, play an important complementary role in rapid delivery of critical NWS environmental information and relies on NWS environmental information to create services specific to their clients.

NWS will provide indirect environmental information services supporting mobile devices by:

a. making our data highly accessible[7] and easy to use by those who develop mobile applications;
b. providing our data in standard formats/protocols which are easily accessed and manipulated;
c. providing smaller data sets, more conducive to access in a mobile environment;
d. providing adequate documentation and interface tools (e.g., Application Programming Interfaces) to ensure easy access/use of NWS data; and
e. educating the public about existing environmental information services supporting mobile devices, regardless of the source.

3 Guidelines for Adopting New Environmental Information Services Supporting Mobile Devices

New environmental information services supporting mobile devices must comply with applicable NWS governance policy and procedures, as well as existing law and federal policies. A decision whether to implement such services will consider the effects of the service on NWS operations,

[6] By following W3C Best Practices for mobile websites, mobile-enhanced websites will enable mobile device access to NWS information and data while reducing the need to create and manage multiple versions of the website.
[7] Availability limits may rarely be placed on data access if usage level is prohibiting equal, reliable access to all users.

as well Enterprise partners. NWS will consider the following factors in any decision on whether or not to implement a new environmental information service supporting mobile devices.

a. Requirements/Mission Connection – NWS will ensure new environmental information services supporting mobile devices are based on validated requirements and these services will directly support the NWS mission.
b. Legal/Policy Factors – Development of new environmental information services supporting mobile devices must conform to existing U.S. Government laws and policies. NWS will consider the key legal and policy factors identified in Appendix B when developing new environmental information services supporting mobile devices.
c. Scientific Validation and Technical Merit – NWS will validate the science and/or technology upon which the new service is based prior to operational implementation.
d. Operational Sustainability – A decision will consider life cycle costs for developing and sustaining the new service (whether developed in-house or through use of COTS tools) and the expected impacts on NWS operations, systems and telecommunications, including resources to provide updates/patches, training, and user support. Responsibility for operations and maintenance of the new service must be identified.
e. Enterprise Context – A decision will consider impacts on Enterprise partners. See factors supporting development of direct environmental information services (listed in section 2.2).

4 Development/Approval Procedures For Direct Services – New direct environmental information services supporting mobile devices will be developed and approved in accordance with NWS governance and development practices and policies documented within existing directives. The following sections present clarifications or modifications to standard procedures.

4.1 Prior to Development

The following procedures will be applied prior to development of new direct environmental information services supporting mobile devices:

a. A proposed requirement for creation of new environmental information services supporting mobile devices will be entered into Capabilities and Requirements Decision Support (CaRDS). The Digital & Graphical Information Support (DGIS) Mission Support Team will be assigned to ensure requirements for new environmental information services supporting mobile devices reflect operational needs and are well-coordinated across NWS.

   - Any proposed substantial changes to provision of environmental information services supporting mobile devices (i.e., not a new requirement) will be coordinated by the Digital & Graphical Information Support (DGIS) Mission Support Team and will be processed through 10-102 for New/Enhanced Products/Services. This includes changes to existing web pages (e.g., new, mobile-friendly versions of NWS web pages.) As part of 10-102 review, Office of the Chief Operating Officer (OCOO) will coordinate with Office of Organizational Excellence (OOE) to determine if the

change warrants additional review through NWS governance, to ensure strategic alignment with public/private/partnership issues.

b. The requirements will be provided to the Mission Delivery Council (MDC) for validation.

c. If the new requirement is validated by the MDC, the validated requirement will be briefed to the Portfolio Integration Council (PIC), which will appoint a service delivery portfolio as lead[8].

d. Per the OPPSD Adjudication of Validated Requirements (OaVR) process, the appointed portfolio will prepare an Investment Justification Request (IJR) to identify potential alternatives and a recommended solution, taking into consideration the development guidelines in section 4.2 below and a consideration of decision factors identified in Section 3.

e. The recommendation will be briefed to the PIC, with inclusion of MDC, OCOO and OOE participants (invited as necessary).

f. If approved by the PIC, OCOO and OOE will determine the potential level of sensitivity of the recommended solution with Enterprise partners in order to identify a need for:
   - Executive Council (EC) decision prior to initiation of development, to ensure strategic alignment with public/private/partnership issues; and
   - External coordination with Enterprise partners.

g. Solutions which consist of the creation of native apps (applications downloaded and run on mobile devices) or other solution deemed to be of high Enterprise sensitivity, will be briefed to the Executive Council prior to development, to ensure strategic alignment with public/private/partnership policies as well as conform to NWSPD 100-4 (Section 4.1 on development of external purpose technology).
   - If approved by EC to proceed with development :
     - The MDC and PIC will each identify a representative from AFS/field and service delivery portfolios, respectively, to lead a team of subject matter experts (including representation from AFSO, OCOO) in providing an analysis of policy/management factors to support a future decision on implementation of the product/service (see Section 3, above).
     - OCOO/OOE will develop a plan for coordination with Enterprise partners about the proposed new product/service.
     - The product/service lead will notify the Analyze, Forecast and Support Office (AFSO) and the effort will be entered into the 10-102/products

catalog. AFSO will work with OCOO/OOE and developers to determine whether to initiate public comment/review on the proposed new product/service before or after a prototype or experimental version is available.

h. Solutions which do not require review by EC will proceed with standard NWS development/governance processes and the procedures identified in sections 4.3 and 4.4 do not apply.

4.2 Development Guidelines

a. Platform/Service-Neutral - Development of environmental information services supporting mobile devices will be platform/service-neutral whenever possible. If developing an NWS environmental information service supporting mobile devices that requires technologies which are not vendor-neutral or cannot provide equivalent functionality across all vendor devices, the reasoning behind this decision will be included in the decision analysis (see, Section 4.1d, 4.3b).

b. Collaboration - With today's escalating demand on IT resources coupled with Government wide budgetary constraints and shortfalls, the NWS needs to focus its IT and hydrometeorological workforce to maximize effectiveness of development efforts. With this understanding, NWS developers should collaborate across NWS in their development of new environmental information services supporting mobile devices.

- NWS AFSO, through CaRDS, will maintain a repository of new requirements for environmental information services supporting mobile devices.

- AFSO, through the Products Catalog, will catalog development efforts (i.e., programs/applications, etc.) related to mobile devices, for the purpose of facilitating collaboration and to track those which are proposed or approved for operational implementation.

c. Nationwide Focus - Development should focus on providing environmental information services supporting mobile devices on a national basis to support basic operations and decision support services. Unless specifically addressing a unique local/regional user need, local/regional developers should apply their efforts to development or enhancement of nationally consistent NWS services. Whenever possible, developers will make enhancements to an existing service to satisfy new requirements in order to ensure efficiency and avoid duplication.

[8] Per existing processes, lead portfolios are responsible for identifying a solution, alternatives, and planning for implementation (including prototyping, development, lifecycle operations and maintenance).

4.3 During Development

a. During development, the new environmental information service supporting mobile devices will not be available to the general public; however, the developer may request feedback from parties external to the National Oceanic and Atmospheric Administration (NOAA)/NWS.

b. In parallel with development, the MDC- and PIC-identified representatives and any designated team(s) will work in conjunction with the lead developer to prepare an analysis of policy and management factors (Section 3) to be considered for an implementation decision. This analysis is in addition to any standard analysis done to carry out MDC/PIC governance processes.

4.4 Approvals

a. When development is completed, the MDC- and PIC-identified representatives will provide a briefing of the analysis of policy and management factors (Section 3), external input (for item ii), and the associated recommendations to the MDC and PIC for 2 decisions, following the guidelines/procedures of NWS Policy Directive (NWSPD) 1-10 and NWSI 10-102. Based on this information the MDC/PIC will make the following decisions/recommendation:

   i. Prior to public comment/review - Approval / disapproval to begin experimental implementation and/or public comment/review. The EC will be notified of this decision by the Chair of the MDC and/or PIC.

   ii. After public comment/review - Recommendation to NWS Executive Council for Approval / disapproval for operational implementation.

b. The MDC and PIC-identified representatives will provide a briefing to the NWS Executive Council presenting an overview of the analysis of policy and management factors (Section 3), external input, and MDC/PIC recommendation for operational implementation. Final approval/disapproval for operational implementation will be provided by NWS Executive Council.

c. The decision for operational implementation will be recorded in a decision memorandum and should include an explanation that is responsive to comments received from public comment/review. The decision memorandum will be posted in the AFSO products catalog and disseminated via NWS Public Information Statement or Service Change Notice.

4.5 Provision for Emergencies. When the need to protect life and property warrants emergency dissemination of NWS information using means other than an official NWS service, the responsible office/region may do so. If the office(s) involved intend to continue providing this service, the provisions of this Directive will be initiated within 30 days after the emergency has ended.

5 Authorities and Responsibilities

5.1 Analyze, Forecast and Support Office (AFSO)

a. AFSO will ensure appropriate validation of requirements for new environmental information services supporting mobile devices, through CaRDS (NWSI 10-103). AFSO will assign the DGIS MST to ensure these requirements reflect operational needs and are well-coordinated across NWS.

b. AFSO will work with MDC/PIC representatives and OCOO Policy Staff to make a recommendation to the NWS Executive Council on a decision to implement new direct environmental information services supporting mobile devices.

c. AFSO, through the Products Catalog, will catalog development efforts (i.e., programs/applications, etc.) related to mobile devices, for the purpose of facilitating collaboration.

d. AFSO will ensure new/enhanced environmental information services supporting mobile devices are entered into and complete processing through procedures defined in NWSI 10-102, New/Enhanced Products/Services.

5.2 Office of the Chief Operating Officer (OCOO), Policy Staff

a. OCOO Policy Staff will work with the Office of Organizational Excellence (OOE) to determine the level of potential sensitivity, with respect to Enterprise partners, of proposed development solutions for new direct environmental information services supporting mobile devices.

b. OCOO Policy Staff will take the lead in evaluation of input from public comment and review, as described in 4.4a, above. Input from Enterprise partners will be gathered in coordination with OOE.

c. OCOO Policy Staff will work with MDC and PIC representatives and AFSO to make a recommendation to the NWS Executive Council on a decision to implement new direct environmental information services supporting mobile devices.

5.3 Office of Organization Excellence (OOE)

a. OOE will work with OCOO to determine the level of potential sensitivity, with respect to Enterprise partners, of proposed development solutions for new direct environmental information services supporting mobile devices.

b. OOE will take the lead in coordinating with Enterprise partners in gathering input on direct environmental information services supporting mobile devices**.**

5.4 NWS Mission Delivery Council (MDC)

a. The MDC will validate new requirements for NWS environmental information services supporting mobile devices.

b. The MDC will identify a representative from the field or AFS portfolio with expertise representing requirements and operations needs to co-lead (with a representative from a service delivery portfolio) a team of subject matter experts in providing an analysis of policy/ management factors to support a future decision on implementation of the product/service (see Section 3, above).

c. The MDC, in coordination with the PIC, will approve/disapprove proceeding with public comment/review of the new direct environmental service supporting mobile devices and provide a recommendation to the EC on whether to proceed with operational implementation (see section 4.4).

5.5 Portfolio Integration Council (PIC)

a. The PIC will appoint a service delivery portfolio as lead to identify a solution, alternatives, and plan for implementation (including prototyping, development, lifecycle operations and maintenance) of new direct environmental information services supporting mobile devices. The appointed portfolio lead will carry out the identified activities.

b. The PIC will identify a representative from NWS service delivery portfolios to co-lead (with a representative from the field or AFS portfolio) a team of subject matter experts in providing an analysis of policy/ management factors to support a future decision on implementation of the product/service (see Section 3, above).

The PIC, in coordination with the MDC, will approve/disapprove proceeding with public comment/review of the new direct environmental service supporting mobile devices and provide a recommendation to the EC on whether to proceed with operational implementation (see section 4.4).

5.6 MDC and PIC Representatives

a. MDC and PIC representatives will lead a team of subject matter experts to analyze the policy and management factors (described in section 3, above) associated with implementation of new direct NWS environmental information services supporting mobile devices. This analysis will be in addition to any standard analysis done to carry out MDC/PIC governance processes.

b. MDC and PIC representatives may create or use existing teams (e.g., Emerging Technologies Integrated Work Team) to prepare the analysis, and will ensure representation from AFSO and OCOO policy staff. Expertise needed to support a thorough analysis should include views from individuals in the following areas: policy, legal, technical, knowledge of field operations, etc.

c. MDC and PIC representatives will work with OCOO Policy Staff and AFSO to make a recommendation to the MDC, PIC and NWS Executive Councils on a decision to implement new direct environmental information services supporting mobile devices. The representatives will schedule and brief these councils to seek a final decision by the EC.

d. The MDC and PIC representatives will work with OCOO Policy Staff and AFSO to document any final decision on operational implementation of new direct environmental information services supporting mobile devices (see section 4.4c).

5.7 NWS Executive Council (EC)

a. Following MDC validation of requirements for new environmental information services supporting mobile devices, and PIC approval of a solution that is determined to have a potential high level of sensitivity with respect to Enterprise partners, the EC will provide guidance related to **s**trategic alignment with public/private/partnership policies prior to initiation of development (see section 4.1g).

b. The Executive Council will review the analysis of policy and management factors (Section 3), input from public comment/review, and the recommendation of MDC/PIC to make a decision on operational implementation of new direct environmental information services supporting mobile devices. The EC will make its decision within 30 days of receiving the necessary input and may confer with others in NWS, NOAA, the Department of Commerce and elsewhere in reaching its decision.

APPENDIX A - References and Definitions

References

NWSPD 1-10 – Managing the Provision of Environmental Information
NWSI 10-102 – New or Enhanced Products and Services
NWSI 10-103 – Capabilities and Requirements Decision Support Process
NAO 216-112 – NOAA's Policy on Partnerships in the Provision of Environmental Information (NAO 216-112)

Definitions (as applied in this instruction)

Mobile application ("apps") – a software application that runs on a mobile device such as a smartphone, tablet, or other portable device. Mobile applications typically perform one dedicated task. Mobile applications support both "pulling" data/information from a web service and allowing the web service to "push" information or data to the device.

Mobile-enhanced web content – web pages which allow mobile devices to interact with the web page using a standard mobile Web browser and use pull technology to access data/information from the web server and display on the mobile device.

NWS "core partner" – See definition in NWSPD 10-24

APPENDIX B - Existing Policy and Legal Factors Guiding Development/ Implementation of Environmental information Services Supporting Mobile Devices

1. Policy Factors: New environmental information services supporting mobile devices must conform to U.S. Government policies, including:

1.1 NOAA's Policy on Partnerships in the Provision of Environmental Information (NOAA Administrative Order (NAO) 216-112) – NWS will adhere to NAO 216-112 in developing new environmental information services supporting mobile devices. In particular:

a. As stated in NAO 216-112, NWS "will take advantage of existing capabilities and services of commercial and academic sectors to support efficient performance of NOAA's mission and avoid duplication and competition in areas not related to the NOAA mission. NOAA will give due consideration to these abilities and consider the effects of its decisions on the activities of these entities, in accordance with its responsibilities as an agency of the U.S. Government, to serve the public interest and advance the nation's environmental information enterprise as a whole."

b. In accordance NAO 216-112, the public shall have the opportunity to provide input on any proposed new mobile services. Procedures for seeking input are described in NWSPD 1-10 and NWSI 10-102. Input from a public comment/review period will be considered in making a decision on whether or not to pursue development/implementation of the proposed service. New environmental information services supporting mobile devices will not be provided external to NWS until this decision has been reached.

1.2 Other Applicable Policies include:

- Web
- Internet Use
- Privacy
- NWS, NOAA, and DoC IT Security policies
- Section 508 of the Rehabilitation Act of 1973
- Information Quality Act Guidelines
- Records Retention Requirements
- NWSPD 1-12, *Managing the Acquisition of Environmental Data from External Parties* – if the service is used to acquire information
- Technology transfer, NWSPD 100-4 – for technology solutions implemented external to NWS (e.g., mobile phone "apps")
- Executive Order 13166, Limited English Proficiency
- NWSI 1-10, Managing the Provision of Environmental Information Services, and its instructions

2. Legal Factors

a. Use of commercial services (e.g., Facebook, Twitter, etc.) to support the proposed environmental information service serving mobile devices must have an end-user license or agreement approved by the General Services Administration and the Department of Commerce Office of the General Counsel.

b. NWS must determine the extent to which (if any) functionality of the proposed environmental information service serving mobile devices is subject to existing patent restrictions (i.e., does any functionality infringe on rights established by existing patents).