U.S. ENVIRONMENTAL PROTECTION AGENCY

OFFICE OF INSPECTOR GENERAL

Hotline Report:
Improving EPA research programs
Operating efficiently and effectively

Management Alert:
EPA Should Promptly Reassess Community Risk Screening Tool

Report No. 17-P-0378 **September 7, 2017**

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Abbreviations

CARE	Community Action for a Renewed Environment
C-FERST	Community-Focused Exposure and Risk Screening Tool
EJSCREEN	Environmental Justice Screening and Mapping Tool
EPA	U.S. Environmental Protection Agency
IT	Information Technology
NERL	National Exposure Research Laboratory
OEI	Office of Environmental Information
OIG	Office of Inspector General
ORD	Office of Research and Development
QAPP	Quality Assurance Project Plan
READ	Registry of EPA Applications and Databases
SHC	Sustainable and Healthy Communities
U.S.C.	United States Code

Cover photo: Image from the C-FERST "View Your Community" web page. (EPA photo)

U.S. Environmental Protection Agency
Office of Inspector General

17-P-0378
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At a Glance

Why We Did This Review

We received a hotline complaint alleging concerns with the U.S. Environmental Protection Agency (EPA) Office of Research and Development's (ORD's) Community-Focused Exposure and Risk Screening Tool (C-FERST). To address the hotline allegations, we evaluated how ORD planned, developed and implemented C-FERST.

C-FERST is an online information and mapping tool, launched in September 2016, that communities and the public can use to learn more about their environmental issues and exposures. According to ORD, C-FERST is intended to serve a broad range of users (e.g., general public, state/local risk assessors, public health agencies and environmental justice coordinators). The purpose of this management alert is not to raise a health concern but rather to timely notify the EPA so that it can promptly act to better manage its planned investment in C-FERST to prevent waste.

This report addresses the following:

- *Improving EPA research programs.*
- *Operating efficiently and effectively.*

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Management Alert: EPA Should Promptly Reassess Community Risk Screening Tool

What We Found

Our review substantiates some hotline allegations about C-FERST. We found that ORD took 8 years to develop a tool that:

- Is different from its intended purpose.
- Did not have a project proposal or request for its development.
- Was outside the agency's information technology requirements.
- Overlaps with other EPA tools.
- Was not widely used in the approximately 9 months after it was publicly released, according to available user data.

C-FERST overlaps with other tools and is not yet widely used, underscoring its $400,000 planned yearly investment as a risk. Efforts by the agency to cut costs, streamline activities and avoid duplication compound the need for the EPA to promptly review C-FERST and similar tools.

ORD planned and designed C-FERST internally as a research tool—outside of the agency's information technology monitoring and accountability requirements—and altered the original purpose of the tool during development without properly documenting this change. ORD also did not consider outcome measures or possible joint governance with similar EPA tools.

Without proper accountability controls, ORD creates a risk that the estimated $400,000 it plans to spend annually for maintenance, operation and enhancements of C-FERST is wasteful government spending. Without metrics to measure performance, it is unclear if C-FERST is being used for its intended purpose or meets user needs. Further, having multiple agency mapping tools that perform similar functions can confuse potential users.

Recommendations and Planned Agency Corrective Actions

We recommend that the Assistant Administrator for ORD review C-FERST and develop an action plan to address issues identified, including whether to retain the tool. If retained, we recommend that ORD develop performance metrics and a user survey. We also recommend that ORD develop certain policies and procedures, review new and existing ORD research tools to determine applicability of the EPA's information technology requirements, and work with agency offices responsible for other geospatial mapping tools to develop a decision support matrix on when to use certain tools. ORD agreed with our findings and recommendations and provided acceptable corrective actions and estimated completion dates. ORD's recommendations are resolved with corrective actions pending.

We also recommend that the Deputy Administrator examine all of the EPA's web-based risk screening and mapping tools to ensure the need for each tool. This recommendation is unresolved.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

THE INSPECTOR GENERAL

September 7, 2017

MEMORANDUM

SUBJECT: Management Alert: EPA Should Promptly Reassess Community Risk Screening Tool
Report No. 17-P-0378

FROM: Arthur A. Elkins Jr.

TO: Mike Flynn, Acting Deputy Administrator

Dr. Robert Kavlock, Acting Assistant Administrator
Office of Research and Development

This is our report on the subject review conducted by the Office of Inspector General (OIG) of the U.S. Environmental Protection Agency (EPA). The project number for this review was OPE-FY17-0006. This report contains findings that describe the problems the OIG has identified and corrective actions the OIG recommends. This report represents the opinion of the OIG and does not necessarily represent the final EPA position. Final determinations on matters in this report will be made by EPA managers in accordance with established audit resolution procedures.

Action Required

In accordance with EPA Manual 2750, the Office of Research and Development provided planned corrective actions in response to our recommendations. All recommendations to the Office of Research and Development are considered resolved. The Office of Research and Development is not required to provide a written response to this final report because it provided agreed-to corrective actions and planned completion dates for all report recommendations. The OIG may make periodic inquiries on the progress in implementing these corrective actions. The Office of Research and Development should update the EPA's Management Audit Tracking System as it completes planned corrective actions.

The recommendation to the Deputy Administrator is unresolved. In accordance with EPA Manual 2750, appropriate OIG and Deputy Administrator staff will discuss resolution within 30 days of the final report.

We will post this report to our website at www.epa.gov/oig.

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Chapter 1
Introduction

Purpose

The U.S. Environmental Protection Agency (EPA) Office of Inspector General (OIG) received an anonymous hotline complaint alleging concerns with the Office of Research and Development's (ORD's) Community-Focused Exposure and Risk Screening Tool (C-FERST). The hotline complaint alleged, among other concerns, that C-FERST:

- Was poorly conceived from the beginning.
- Was undertaken with little understanding of information technology (IT) and design architecture protocols.
- Is redundant with other EPA tools (specifically, the Environmental Justice Screening and Mapping Tool, also known as EJSCREEN).
- Overstates claims of usefulness in setting community priorities in response to pollution exposures.

In response to the allegations, we evaluated how ORD planned, developed and implemented C-FERST. The purpose of this management alert is not to raise a human health or environmental concern but rather to provide timely notification to the EPA so that it can promptly act to better manage its investment in C-FERST to prevent waste.

Background

C-FERST is a web-based geospatial mapping tool developed by ORD to provide users with access to resources to help identify and provide information about local environmental health issues. The tool includes fact sheets and information on 20-plus pollutants, and structured guides that can help communities assess local environmental conditions. C-FERST users are intended to be able to explore exposure and risk reduction options, and use the tool to plan community-based projects that mitigate harmful environmental exposures.

ORD's Sustainable and Healthy Communities national research program approved C-FERST and its annual budget, and the National Exposure Research Laboratory developed the tool.

ORD started developing C-FERST around 2008 and launched the tool on the EPA's public website in September 2016. ORD invested over $1.4 million during fiscal years 2010–2016 on contractor support to develop both C-FERST and

Tribal-FERST.[1] ORD staff time on C-FERST grew over that time period, from 1.5 to 2.75 full-time equivalents per year.[2] Ongoing annual costs are projected to be nearly $400,000 for fiscal years 2017, 2018 and 2019, to include: maintenance, updates and enhancements, outreach through training and technical assistance, case studies on uses and needs, and integration/interoperability with other EPA tools.

C-FERST Impetus

EPA staff involved in C-FERST's development described its impetus in early journal articles, including the following:

> [C-FERST] was designed to support communities' environmental justice (EJ) efforts. This tool is being developed by the EPA's Office of Research and Development in the National Exposure Research laboratory, which is conducting research to provide tools that enhance community-based cumulative risk assessments. This research responded to requests from the EPA's [Community Action for a Renewed Environment] CARE program, the Office of Environmental Justice, EPA regional offices, and communities themselves, as well as recommendations from the National Academy of Sciences, National Academy of Public Administration, and other agencies.[3]

The EPA's former CARE program was intended to empower communities to develop and implement their own environmentally focused projects. C-FERST was originally envisioned as a tool that could walk communities through the various stages of the CARE Roadmap, a 10-step planning process that communities can follow in conjunction with C-FERST to learn about environmental health risks and impact; and build local consensus, partnerships, and community capacity sustainable in the long run. C-FERST provides resources for each of these steps.

CARE Roadmap Process

1) **Build a partnership.**
2) **Identify community concerns.**
3) **Identify community vulnerabilities.**
4) **Identify community assets.**
5) **Identify concerns for immediate action.**
6) **Collect and organize information.**
7) **Rank risks and impacts.**
8) **Identify potential solutions.**
9) **Set priorities for action and begin work.**
10) **Evaluate results and become self-sustaining.**

[1] Tribal-FERST is a tool similar to C-FERST targeted at tribal groups; this tool has not yet launched.
[2] These figures represent a portion of costs since the agency, with some exceptions, does not track EPA staff time by project in the agency's official timekeeping system.
[3] Zartarian et al. *The Environmental Protection Agency's Community-Focused Exposure and Risk Screening Tool (C-FERST) and Its Potential Use for Environmental Justice Efforts.* American Journal of Public Health. Supplement 1, 2011, Vol. 101, No. S1, page S286.

C-FERST Pilot Testing and Peer Review

As a part of C-FERST's development, from 2010 to 2012, ORD conducted case studies with two pilot communities in EPA Region 1 that wanted to identify and prioritize environmental issues. The goals of these case studies included:

- Providing CARE partners with useful information to identify and prioritize issues.
- Enhancing C-FERST usability.
- Providing transferable, generalizable methods to identify and prioritize issues.
- Enhancing cumulative exposure and risk science to inform decision-making.

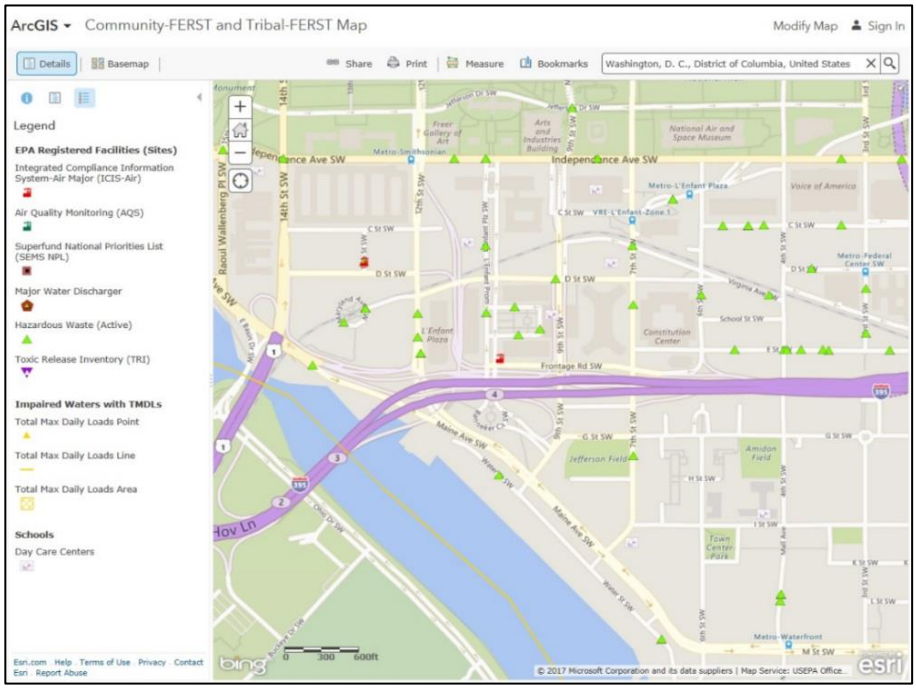
The pilot communities considered such environmental issues as asthma rates, air pollution, ambient and indoor air quality, lead, and water quality. The pilots identified expectations of communities, current uses of C-FERST, and needed modifications. Additionally, ORD provided 455 individuals with access to the field-testing version of C-FERST from September 2011 to December 2014. These individuals included EPA regional and program office representatives, state and local governments, non-profit organizations, academic institutions, industry, and consulting firms. From 2014 to 2016, the C-FERST team also worked closely with EPA Region 10 to conduct trial tests with regional community users.

ORD conducted a contractor-led external letter peer review of C-FERST in 2013–2014, receiving a final peer review report in February 2014. A letter peer review seeks individual written comments from independent experts. Each reviewer evaluates the draft technical work product independently without consultation from other peer reviewers. The EPA contractor selected four peer reviewers based on a list of qualifications provided by ORD. The C-FERST peer review charge included 19 questions under eight categories. Peer reviewers had about 5 weeks to conduct their review. ORD summarized its responses to peer reviewer comments in an internal report in April 2014.

EPA's Geospatial Platform and Tool Development

As noted above, C-FERST is a web-based geospatial mapping tool. The EPA's geospatial platform helps people identify and describe environmental situations in specific locations to understand local environmental health issues, and target areas with high environmental risk (see Figure 1). This platform supports multiple tools and ensures that there is a level of consistency across tools.

Figure 1: C-FERST facility map for a portion of Washington, D.C., area



Source: Map generated by the OIG using the C-FERST website.

The EPA maintains an application inventory of tools in its Registry of EPA Applications and Databases (READ). This system, which tracks all information resources across the agency, is maintained by the EPA's Office of Environmental Information (OEI). ORD maintains a similar system called the ORD Application Inventory. ORD's system provides a centralized repository of known IT assets (systems, databases, models and decision-making tools) that have been planned, developed/acquired or are currently under development to address specific research questions and administrative requirements. ORD's inventory feeds into READ and currently lists about 320 IT assets. C-FERST is one of the IT assets listed in both READ and ORD's Application Inventory.

Responsible Offices

ORD—which includes the Office of Science Information Management, the National Exposure Research Laboratory (NERL), and the Sustainable and Healthy Communities (SHC) national research program—has primary responsibility for the subjects covered in this review.

Scope and Methodology

We conducted our review from January to June 2017. We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform our work to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained

provides a reasonable basis for the findings and conclusions in this report based on our audit objectives.

We analyzed numerous documents pertaining to research tool design, quality and peer review, including policies, procedures and guidance documents. We also reviewed journal articles on the impetus of C-FERST and contracts supporting its development.

We interviewed key ORD staff and managers responsible for the C-FERST concept/design, development, implementation and quality assurance. To compare C-FERST with other EPA tools, we interviewed staff in other agency program offices (e.g., Office of Policy and Office of Environmental Justice, on EJSCREEN). To understand coordination of C-FERST and other tools on the geospatial platform, we met with ORD's Office of Science Information Management and OEI. We also interviewed all four C-FERST external peer reviewers on the peer review process and their perspectives on the tool.

To obtain additional perspectives, we obtained information from ORD on 226 individuals—127 EPA and 99 non-EPA[4]—who either contacted the agency through accessing the site, attended a C-FERST pilot training session, or participated through a Region 10 partnership. We interviewed nearly 10 percent within the EPA and each category of non-EPA individuals for their experiences with C-FERST.[5]

[4] The 99 non-EPA employees encompassed the following categories: 44 state/local government employees, 35 individuals from organizations, 14 individuals from academic institutions, five individuals with private emails or missing contact information, and one individual from a non-EPA federal agency.

[5] We interviewed 20 individuals representing the EPA and the largest categories, as follows: 12 EPA employees, four representatives of state/local government, two representatives of organizations, and two representatives of academic institutions. We refer to these individuals as "users" throughout our report.

Chapter 2
ORD Should Reassess C-FERST and Complete Planned Actions to Mitigate Risks

Our review substantiates some concerns raised in the hotline allegation about C-FERST. We found that ORD took 8 years[6] to develop a tool that:

- Is different from its intended purpose.
- Did not have a project proposal or request for its development.
- Was outside the agency's information technology requirements.
- Overlaps with other tools.
- Was not widely used in the approximately 9 months after it was publicly released, according to available user data.

ORD planned and designed C-FERST internally as a research tool—outside of the agency's IT monitoring and accountability requirements—and altered the original purpose of the tool during development without properly documenting this change. ORD also did not consider outcome/performance measures or explore ways to reduce overlap with similar tools through joint governance. Without proper accountability controls, ORD cannot ensure that it will spend the estimated $400,000 it plans to spend annually for maintenance, operation and enhancements of C-FERST in a manner that prevents waste. Without metrics to measure performance against goals, it is unclear if C-FERST is being used for its intended purpose or meeting user needs. Further, having multiple agency tools that perform similar functions can confuse potential users.

C-FERST Does Not Calculate Cumulative Risks as Originally Intended, and This Change Was Not Properly Documented

> ***Cumulative risk assessment is defined as an analysis, characterization, and possible quantification of the combined risks to health or the environment from multiple agents or stressors.***
>
> - EPA's Framework for Cumulative Risk Assessment, May 2003

When C-FERST was first conceived, it was included as part of Long Term Goal 2 in the ORD's Human Health Research Program (the predecessor to the SHC national research program) Multi-Year Plan for 2006–2013. The plan noted a long-term objective to produce a research framework outlining tools and approaches to characterize and assess aggregate exposures and cumulative risks. Our review of documentation related to the planning and development of C-FERST shows that a significant change occurred in the design objectives of the tool between when

[6] ORD staff noted that part of this time included reviewing the tool through pilot testing and peer review, which we described in Chapter 1, as well as awaiting updated air toxics data.

ORD released the prototype version (circa 2008) and the official launch of the tool in September 2016. The change had to do with the claim that C-FERST would characterize cumulative risks to toxic substances. We observed a range of statements over time on the extent to which C-FERST addresses cumulative risk assessment:

> **2010** [C-FERST] balances innovative, high quality science with user-friendliness to characterize the cumulative impact of multiple stressors for: prioritizing environmental issues within communities; identifying communities at risk; and ultimately, assessing impact of actions (accountability).[7]
>
> **2011** C-FERST will contain exposure-based cumulative risk characterizations based on the best available information and science.[8]
>
> **2013** C-FERST is designed to help identify, prioritize, and manage community environmental and public health issues by providing various types of information related to potential exposures and cumulative risks to provide communities with a scientifically credible means for evaluating, prioritizing, and mitigating environmental health concerns.[9]
>
> **Present** Although C-FERST offers multimedia environmental data and demographic data, it does not add together or otherwise calculate cumulative risks for different environmental exposures. … C-FERST does not calculate cumulative risk or impacts.[10]

ORD officials verbally acknowledged this change to the OIG and noted that early communications were more aspirational whereas later communications reflected C-FERST's actual abilities. Both the NERL Director and Deputy Director, as well as the C-FERST Principal Investigator, said that cumulative risk assessment was more complex than previously anticipated. The Principal Investigator also note that the pending issuance of the EPA's cumulative risk assessment guidelines contributed to the change in objectives.[11] One NERL scientist said C-FERST cannot rank risks—the seventh step in the CARE roadmap that C-FERST purportedly supports. ORD is developing another tool—not yet launched—called

[7] From ORD's 2010 contract with one of the C-FERST developers.
[8] Zartarian et al. *The Environmental Protection Agency's Community-Focused Exposure and Risk Screening Tool (C-FERST) and Its Potential Use for Environmental Justice Efforts.* American Journal of Public Health. Supplement 1, 2011, Vol. 101, No. S1, page S288.
[9] From ORD's 2013 contract for the external peer review.
[10] From the C-FERST website page, "Questions and Answers about C-FERST," as of December 13, 2016.
[11] The EPA issued its *Framework for Cumulative Risk Assessment* in May 2003, but the agency's cumulative risk assessment guidelines are still under development.

the Community Cumulative Assessment Tool, which may be integrated as a module within C-FERST to address the cumulative risk assessment and risk prioritization.

This change in objectives was not reflected in any C-FERST project-specific documentation. Absent a proposal on C-FERST's objectives, which we discuss in the next section, we reviewed the tool's Quality Assurance Project Plan (QAPP). ORD has issued three QAPPs to date on C-FERST—in 2009, 2013 and 2017. However, none of these described the shift away from cumulative risk assessment, which had been articulated in strategic planning documents and research articles, such as those cited above.

> ***"This QAPP is to be reviewed regularly, and changes and new additions to the C-FERST site will be reflected in future versions."***
>
> - C-FERST QAPP, August 2009

ORD officials said that the QAPP may not be an appropriate vehicle for registering a change in the project's goals because QAPPs only address data-related issues. However, NERL's 2012 Quality Management Plan notes that QAPPs document, among other elements, background information and project goals. Additionally, the EPA's quality assurance requirements note that QAPPs integrate all technical and quality aspects of a project, including planning, implementation and assessment. The requirements mandate that QAPPs document the project description and any subsequent significant changes thereof:

> When a substantive change is warranted, the originator of the QA Project Plan shall modify the QA Project Plan to document the change and submit the revision for approval by the same authorities that performed the original review. Only after the revision has been received and approved (at least verbally with written follow-up) by project personnel, shall the change be implemented.[12]

Documenting in the QAPP the objectives of a project and any changes that may occur, such as a shift away from the cumulative risk assessment, becomes critically important as a means of tracking the evolution of a project throughout its lifecycle. Moreover, EPA quality assurance requirements specify annual reviews of the QAPP for programs or projects of long duration.[13] ORD's 2017 C-FERST QAPP revision now requires that the Principal Investigator perform annual reviews of the QAPP, which is an improvement over the prior 4-year update interval.

[12] U.S. EPA. *EPA Requirements for Quality Assurance Project Plans.* EPA QA/R-5. March 2001.
[13] *Id.*

ORD Developed C-FERST Absent a Project Proposal or Request for the Tool's Development

We did not see evidence that ORD developed a project proposal that outlined goals, objectives and/or performance outcomes for the C-FERST prototype (circa 2008). Instead, ORD indicated that early ORD presentations and publications, developed in 2008–2009, described the vision for C-FERST. ORD's project management controls over research tools, such as C-FERST, do not explicitly require formal project proposals before approving funding. Rather, general areas of research are approved as part of ORD's process to set Strategic Research Action Plans for each national research program. C-FERST is part of SHC's research portfolio, and SHC's predecessor—ORD's Human Health Research Program—initially approved C-FERST.

While early presentations and publications on C-FERST generally described ideas for the tool, we did not see evidence that ORD performed a systematic assessment of community needs for the tool. This was noted in 2014 by one of the peer reviewers and agreed to by ORD in its written response to peer review comments.

One peer reviewer said C-FERST is unlikely to be useful to communities unless it is redesigned to respond to specific community concerns.

In its written responses to peer review comments, ORD said the tool was developed with extensive input from EPA regional offices and communities. As noted above, a 2011 journal article said C-FERST research responded to requests from, among others, the CARE program, the Office of Environmental Justice, EPA regional offices, and communities. In interviews with our team, SHC leadership said the air program requested an electronic tool for the CARE roadmap. However, ORD has not provided clear documentation from any EPA program office or community requesting the tool.

Instead, in its 2011 journal articles ORD cited gathered input from two CARE program project officers as impetus for the tool's early development efforts. The articles also generally described the need for, and anticipated benefits of, C-FERST in helping communities understand and/or map exposures:

- In an effort to advance the science to accurately characterize and communicate community health risk, ORD is developing the Community-Focused Exposure and Risk Screening Tool. … C-FERST will automate the laborious process of generating maps of interest for community mapping projects.[14]

[14] Hammond et al. *Assessment and Application of National Environmental Databases and Mapping Tools at the Local Level to Two Community Case Studies.* Risk Analysis. Vol. 31, No. 3. 2011, page 485.

- [C-FERST] provides regions and communities with a user-friendly tool to understand local exposure information (based on solid science) so that they can make informed, cost-effective decisions and take action. … C-FERST bridges the gap between the emerging community-based cumulative risk science and its actual use by, first, the EPA's regional offices and then community groups at large.[15]

ORD said it does not explicitly require formal project proposals and, instead, general areas of research are approved as part of ORD's process to set strategic research plans for each national research program. NERL leadership said that, early on, this amounts to more of a "concept" instead of formal plan. However, an approved project proposal or similar document—containing the objectives, justification, design approach and methodology for measuring performance—would provide a clear path and ensure accountability as the project moves forward.

ORD Developed C-FERST as a Research Tool, Outside of Requirements for an IT Application

> ***"A comprehensive approach [to system life cycle management] ensures that EPA IT systems and applications are properly planned and managed, controllable, cost-effective, and support the mission and business goals of the Agency."***
>
> - EPA Information Procedures: System Life Cycle Management Procedure, CIO 2121-P-03.0, September 21, 2012

The EPA's policy governing its IT investments defines IT to include any equipment/websites used for data management and display. According to ORD's Office of Science Information Management—the ORD office that supports IT and application development and maintenance—C-FERST and other ORD-developed web tools are not considered IT applications. Consequently, these tools are excluded from requirements in the EPA's IT policies, including system lifecycle management. Instead, C-FERST is categorized as a "research tool."

ORD designed C-FERST internally, working with an ORD contractor, and coordinated with OEI when necessary to add the mapping capabilities of the agency's geospatial platform. SHC approved and funded C-FERST as part of the SHC research plan while noting that they were not familiar with IT requirements for research tools. ORD's Office of Science Information Management said C-FERST's development was not its lane of responsibility, and it did not track or report C-FERST under the EPA's IT requirements. The Director of the Office of

[15] Zartarian et al. *The Environmental Protection Agency's Community-Focused Exposure and Risk Screening Tool (C-FERST) and Its Potential Use for Environmental Justice Efforts.* American Journal of Public Health. Supplement 1, 2011, Vol. 101, No. S1, page S293.

Science Information Management also said that the office does not have OEI review each research tool developed by ORD. Even if it did, OEI does not coordinate agencywide management of research tools, which could prevent overlap of efforts through, for example, joint governance of similar tools.

SHC said day-to-day management of the research tool fell to NERL. One NERL scientist with experience in systems dynamics and decision science said that the tool was developed without coordination between the ecosystems and human health sides of ORD, and that C-FERST was developed before staff with spatial data experience heard about it.

A staff person within ORD's Office of Science Information Management said the recent introduction of the ORD Application Inventory (mentioned in Chapter 1) should help ORD review and monitor new applications, such as research tools. That office now checks the inventory first before approving any new application.

C-FERST Overlaps With Other Agency Tools and ORD Has Not Described C-FERST's Unique Components

As noted above, C-FERST is a geospatial mapping tool developed by ORD as an environmental screening tool for users to identify potential environmental harm in their communities. There are key similarities and differences between C-FERST and other EPA geospatial mapping tools, including EJSCREEN, EnviroAtlas, NEPAssist and MyEnvironment. Table 1 shows environmental data available in each tool.

Table 1: Environmental data in C-FERST and four other EPA geospatial mapping tools

	C-FERST	EJSCREEN	EnviroAtlas	NEPAssist	MyEnvironment
Air Toxics	Yes	Yes	No	Yes	Yes
Particulate Matter and Ozone	Yes	Yes	Yes	Yes	Yes
Demographics	Yes	Yes	Yes	Yes	No
EPA Regulated Facility	Yes	Yes	No	Yes	Yes
Ecosystem Services	No	No	Yes	No	No
Water Quality	Yes	Yes	Yes	Yes	Yes

Source: OIG summary of geospatial mapping tools.

According to the U.S. Government Accountability Office, overlap occurs when multiple programs "have similar goals, engage in similar activities or strategies to achieve them, or target similar beneficiaries."[16] Duplication occurs when two or more programs "are engaged in the same activities or provide the same services to the same beneficiaries."[17] Overlap and duplication can affect program implementation, outcomes and impact, and cost-effectiveness. Overlap might not necessarily lead to actual duplication, and some degree of overlap may be

[16] U.S. Government Accountability Office, *2016 Annual Report: Additional Opportunities to Reduce Fragmentation, Overlap, and Duplication and Achieve Other Financial Benefits*, GAO-16-375SP, April 13, 2016, page 2.
[17] *Id.*

justified. Agencies can mitigate negative effects of overlapping programs by leveraging resources for joint activities such as training and outreach efforts. To validate the effects, the duplicative or overlapping program/activity should be assessed and compared to determine relative performance and cost-effectiveness.

EPA documentation notes that C-FERST has some similarities to other EPA web-based tools. All four C-FERST peer reviewers commented on potential overlap and the benefit of integrating C-FERST with similar tools.

While multiple EPA geospatial mapping tools draw from the EPA geospatial platform, which creates some operational efficiencies, some interviewees stated that: (1) it is challenging for users to differentiate between the various EPA geo-spatial analysis tools to determine which to use and when, and (2) the tool is not immediately intuitive and requires training to be used effectively. One of the peer reviewers said there were problems with the "usability, functionality, and navigability" of C-FERST. Some sampled users expressed confusion on when to use certain tools (a subsequent section describes the OIG's user sampling). ORD said a four-tool comparison chart provided to our team (and available via the EJSCREEN website)[18] is intended to help users differentiate among the tools. However, this chart provides broad, overview information for only four tools and does not include other similar/available EPA tools or help users determine which to use and when.[19]

Some people interviewed said that they found C-FERST challenging to use, and it would be even more so for community members without specific training.

In our assessment, based on our interviews with EPA staff and others, C-FERST overlaps most closely with EJSCREEN. EJSCREEN and C-FERST have similar functions and capabilities for identifying environmental risks in a community. Both tools provide a combination of demographic and environmental data (see Table 1), and allow users to compare the data from their local community (census tract) with state-level data. While each tool has some unique features, most users and peer reviewers that we interviewed could not clearly differentiate the tools. Following are features unique to EJSCREEN and C-FERST:

- **EJSCREEN:** Users can look at environmental justice indices (combinations of environmental and demographic information) based on percentiles, and narrow in on specific demographic information not available elsewhere (including by language, place of birth, age, etc.).

- **C-FERST:** Users can access more specific environmental data (particularly from the National Air Toxics Assessment dataset), find detailed information on potential ways to mitigate the harms of specific

[18] See the chart at https://www.epa.gov/ejscreen/epa-4-tool-comparison-chart. In addition to C-FERST, the chart includes EJSCREEN, EnviroAtlas, and the National-Scale Air Toxics Assessment.
[19] Other tools mentioned by users that are not included in this chart include the Benefits Mapping and Analysis Program (BenMAP), and the Community-LINE Source Model.

environmental pollutants through C-FERST's Issue Profiles, and see examples and advice for how to plan a community-level project with C-FERST's CARE Roadmap.

ORD and others—such as the EPA's Office of Environmental Justice—described C-FERST and EJSCREEN as distinct and complementary tools, noting that C-FERST provides context to information that may be available from other sources (e.g., MyEnvironment or EJSCREEN). One EPA regional user remarked that the nuanced level of data C-FERST provides is useful in their work. Other users of the tool said they use EJSCREEN first as a broad screening tool and then move to C-FERST to hone in on more community-specific data.

One OEI staff person said joint governance of EJSCREEN and C-FERST would be a good idea (i.e., merging the management and resources of the two tools to make future decisions on functions, use and needed updates). While an Office of Policy staff person involved in the development of EJSCREEN said he does not believe the tools should be consolidated, he does believe all of the EPA's tools should be harmonized to avoid duplication of effort and to use shared resources. The developer further noted that documents helping users determine which tools to use would be helpful.

C-FERST's Research Plan Did Not Include Outcome Measures

The Government Performance and Results Act Modernization Act of 2010 requires agencies to use performance information in decision-making, and it holds agencies accountable for achieving results and improving government performance.[20] The act defines program evaluation as an assessment of the manner and extent to which federal programs achieve intended objectives.[21] Additionally, the U.S. Government Accountability Office notes that program performance measurement entails "the ongoing monitoring and reporting of program accomplishments, particularly progress toward pre-established goals," and is typically conducted by program or agency management.[22] Performance measures address process (type or level of activities conducted), outputs (direct products and services delivered), or outcomes (results) of "any activity, project, function, or policy that has an identifiable purpose or set of objectives."[23]

ORD did not identify performance measures during the C-FERST development process. The NERL Director told us that NERL is now exploring ideas for how to measure whether C-FERST is meeting community needs, and the SHC Director

[20] Government Performance and Results Act Modernization Act of 2010. Public Law 111-352, January 4, 2011, Sections 3 and 4. See also 31 U.S.C. §§ 1115, 1116 and 1121.
[21] Government Performance and Results Act Modernization Act of 2010. Public Law 111-352, January 4, 2011, Section 4. See also 31 U.S.C. § 1115(h)(12).
[22] U.S. Government Accountability Office. *Performance Measurement and Evaluation: Definitions and Relationships.* GAO-11-646SP. May 2011.
[23] *Id.*

confirmed that no measures are currently available for monitoring C-FERST performance. As of April 2017, the C-FERST team acknowledged that the only metric they collect is Google Analytics use data on the website, which the SHC Director said is not a useful metric for measuring the performance of the tool. In the absence of output or outcome metrics, the Google Analytics data on webpage views provides the only input on the level of user activity for the C-FERST website. Reporting of unique webpage view data[24] for C-FERST from September 2016 to April 2017 shows spikes in viewers navigating to the site after ORD conducted outreach/training on the tool.

As noted above, during the development phase, NERL collected and incorporated user feedback from community case study pilots and field testing. This included developing additional updates, adding a community forum, developing training, improving user interface accessibility, and improving map and data functions.

Current SHC and NERL managers were unable to explain why performance measures were not included in the design or development of C-FERST, although they acknowledged that there had been changes in both ORD's structure and C-FERST management and leadership during the development period. In addition, as discussed above, the intended purpose of C-FERST changed from a cumulative risk assessment tool to focus more on risk screening and community engagement.

ORD indicated there are plans to incorporate additional monitoring measures for C-FERST. The C-FERST lead said the next steps include an effort to try to collect more quantitative data on system usage, but the first priority is providing training sessions for the tool. However, the recently updated QAPP (May 2017) under "Assessments and Oversight" only discusses planned development, training and outreach activities for C-FERST and Tribal-FERST, as well as planned reviews of data and web links. There is no mention of performance measurement of the tool going forward, except the intent to review usability through user feedback. ORD indicated that C-FERST's estimated costs cover not only maintenance, updates and enhancements for the tool, but also public health data and models, outreach in the form of training and technical assistance, case studies, and potential integration/interoperability with other tools (e.g., EJSCREEN and EnviroAtlas). The case studies will reportedly be used to gain feedback on uses and agency/community needs.

OIG Sampling Indicates Limited Use to Date

ORD asserted that C-FERST is well used by communities and has served as a tool in helping with decisions about community risks. However, we found that the four C-FERST peer reviewers and a majority of our sample of users (16 of 20) are not using the tool. We found that only four out of 20 sampled users (three EPA staff

[24] The data category "unique page views" tracks a person's usage on the entire site for a period or session of time (generally about 30 minutes).

and one academic representative) had used the tool to either directly assist communities in identifying environmental risks or to provide C-FERST training. Cited reasons for not using the tool included:

- Forgetting about the tool.
- Not being aware that it had been made publicly available.
- Not being familiar enough with the tool.
- Using other tools to meet their needs.

Three individuals indicated they would like to use the tool in their future work now that they were reminded of it through our interviews. The four individuals who said they use C-FERST—as well as four non-users, so 40 percent of our sample—expressed enthusiasm for the tool's potential capability and what it can do for communities, though some cautioned that training to use the tool was needed. Additionally, one community non-profit user described tools like C-FERST as "tremendously useful" and added: "There is an interest in the communities but people are just not aware. ... Government agencies don't do a good enough job informing people about issues and tools." On this, we note below ORD's plans to increase C-FERST outreach. Nonetheless, for now, C-FERST remains a publicly available tool without identified performance measures or a plan for monitoring the progress against established goals. ORD has insufficient evidence to support its assertion that communities are using C-FERST as a community engagement tool. Without metrics to measure C-FERST's performance against its goals, it is unclear as to whether C-FERST is being used for its intended purpose and meeting identified user needs.

One EPA regional staff person told us the reason for not using C-FERST was because she understood the tool to be a community tool and not intended for EPA use.

Planned ORD Actions Could Mitigate Some Risks

During our review, we learned of planned ORD actions that could address some noted risks for C-FERST, as well as research tools generally.

For C-FERST, ORD plans to increase marketing and outreach via train-the-trainer and "tools ambassador" efforts, which could result in increased use. ORD's SHC launched the tools ambassador effort as an informal initiative about a year ago at the request of regional staff volunteers through the agency's Skills Marketplace program.[25] Tools ambassadors conduct training and advertise tools to colleagues and local groups. SHC's Director believes ambassadors are currently in place in less than half of the EPA's regions.

ORD also plans to issue a report summarizing C-FERST usage data sometime in 2018. ORD noted this planned report in its 2014 response to peer review

[25] Skills Marketplace is a part-time project application to bring on extra hands for a set time period (1 year or less).

comments, specifically in response to one peer reviewer who said it would be helpful to "provide examples of how communities have used data (made more accessible by C-FERST) to influence decision making." NERL's Director added that they are working with state partners, such as the Environmental Council of States, to get inputs on community uses. Also, ORD plans to conduct user surveys—an approach suggested by one peer reviewer and twice used by the EJSCREEN team—to obtain data and feedback. We provided ORD a copy of EJSCREEN's 2016 "impact survey" as an example.

For ORD research tools generally, NERL prepared a draft guidance in March 2016 that considers the life-cycle of a web-based tool in five steps (Table 2):

Table 2: Sequence of events for web-based tools

Life cycle		Clearance	
Step 1	Define concept and plan		Communicate: awareness and support
Step 2	Develop	Validate technical quality and compliance	
Step 3	Clear and deploy		
Step 4	Operate and maintain		
Step 5	Revisit concept and plan		

Source: Draft NERL guidance on development and release of web-based tools.

The draft guidance notes that technical quality, awareness and partnering would be accomplished through use of a launch team comprised of, among others, the lead investigator; members of the research team; and representatives from ORD's Office of Science Information Management, OEI and quality assurance. The draft guidance further notes that:

> The final organizational level and corresponding requirements for clearance depend on the breadth of use and impact. The greater the likely volume of use, potential financial impact and potential social impact, the greater the more technical review and higher organizational involvement required stringency and amount of requirements for clearance.

Aside from generally noting impact, the draft guidance does not address expected performance measures or outcomes. NERL notes that the draft guidance is for "development and approved public release of a web based tool while a more detailed guidance resource is being assembled." Finalizing this guidance could address concerns we heard in interviews on a lack of direction in this area. For example, one NERL scientist said: "I don't think we have a clear strategic plan for developing, implementing and maintaining these types of things." Another NERL scientist said ORD needs a lab-wide procedure on tool development.

Additionally, ORD acknowledges the importance of helping users distinguish among numerous tools. ORD has discussed creating a "decision logic guide" to assist people in determining which tool to use in addressing their particular query or issue. The guide is in the concept stage and shows the relationship between ORD tools. ORD said further development of this guide is not a high priority item at this time given other budgetary priorities and limitations. ORD also said the agency is working on a "local government portal" to help get people to the right tool for their needs, and that SHC is also considering ways to help users sort through the available tools for a particular issue (e.g., green infrastructure). At this time, ORD has not developed a "wizard"-type mechanism for community-based mapping tools, but SHC's Deputy Director acknowledged it would be good to do so.

The EPA's National Environmental Justice Advisory Council recommended in 2004 that the EPA provide guidance regarding minimum criteria for selection and use of a particular tool.

All four C-FERST peer reviewers and 19 of 20 OIG-sampled users believe a "tool decision matrix" of some kind would be useful. Many users (14 of 20) were familiar with other geospatial mapping tools (e.g., EJSCREEN and EnviroAtlas). One state agency user said that having too many tools overwhelms people, and leads to confusion and tools not being used.

Conclusion

We are alerting the EPA to risks associated with C-FERST so that the agency can take steps to promptly assess and mitigate the risks. The intent of C-FERST changed during development. Further, it overlaps with other tools and there are no means to measure its performance. Anticipated EPA budget cuts and current efforts by the agency to reshape priorities and programs, streamline activities and avoid duplication further compound the need for the agency to promptly review C-FERST and similar tools in light of the risks identified.

Recommendations

We recommend that the Assistant Administrator for Research and Development:

1. Review the Community-Focused Exposure and Risk Screening Tool and develop an action plan with timeframes to address issues identified, including considerations on whether to retain the tool. If retained:

    a. Develop metrics for measuring the tool's performance and establish a regular schedule for performance evaluations.
    b. Survey users to obtain feedback on tool utilization and any needed improvements.

2. Develop policies and procedures for planning, developing, implementing and monitoring the performance of web-based research tools. Policies and procedures could build on the draft guidance for web-based tools

developed by the National Exposure Research Laboratory, and should ensure that any new Office of Research and Development research tool stems from a clear project proposal that includes ongoing monitoring metrics and outcome measures, and vetting to ensure there is a need and no overlap with other tools.

3. Review new and existing Office of Research and Development research tools to determine the applicability of the agency's information technology requirements.

4. Work with agency offices responsible for other geospatial mapping tools to develop a decision support matrix for when to use certain tools and for what purposes.

We recommend that the Deputy Administrator:

5. Examine all of the EPA's web-based risk screening and mapping tools to ensure the need for each tool and to avoid potential overlap, duplication and waste.

Agency Comments and OIG Evaluation

Based on discussions during a June 2017 meeting with EPA managers and our review of written comments, we made changes to the report where appropriate. ORD agreed with our findings and recommendations and provided acceptable corrective actions and estimated completion dates, as well as subsequent clarification to its response to recommendation 2. Recommendations 1 through 4 are resolved with corrective actions pending.

While the Deputy Administrator's office agreed with our findings, we do not believe that the office's response fully addressed recommendation 5. In subsequent correspondence, the Deputy Administrator's office said that the EPA's program and regional offices determine the need for web-based risk screening and mapping tools as they consider how best to implement their programs. In addition, the Deputy Administrator said that he has asked OEI to reinforce with the program offices and regions that only tools addressing clearly defined needs should move forward to development. We believe that the Deputy Administrator's office has full authority to review the need for web-based tools and should not delegate these decisions to program offices. Recommendation 5 is unresolved with resolution efforts in progress.

Appendices A and B document, respectively, written comments from ORD and the Office of the Administrator.

Status of Recommendations and Potential Monetary Benefits

RECOMMENDATIONS

Rec. No.	Page No.	Subject	Status[1]	Action Official	Planned Completion Date	Potential Monetary Benefits (in $000s)
1	17	Review the Community-Focused Exposure and Risk Screening Tool and develop an action plan with timeframes to address issues identified, including considerations on whether to retain the tool. If retained: a. Develop metrics for measuring the tool's performance and establish a regular schedule for performance evaluations. b. Survey users to obtain feedback on tool utilization and any needed improvements.	R	Assistant Administrator for Research and Development	9/30/19	
2	17	Develop policies and procedures for planning, developing, implementing and monitoring the performance of web-based research tools. Policies and procedures could build on the draft guidance for web-based tools developed by the National Exposure Research Laboratory, and should ensure that any new Office of Research and Development research tool stems from a clear project proposal that includes ongoing monitoring metrics and outcome measures, and vetting to ensure there is a need and no overlap with other tools.	R	Assistant Administrator for Research and Development	9/30/18	
3	18	Review new and existing Office of Research and Development research tools to determine the applicability of the agency's information technology requirements.	R	Assistant Administrator for Research and Development	9/30/19	
4	18	Work with agency offices responsible for other geospatial mapping tools to develop a decision support matrix for when to use certain tools and for what purposes.	R	Assistant Administrator for Research and Development	9/30/19	
5	18	Examine all of the EPA's web-based risk screening and mapping tools to ensure the need for each tool and to avoid potential overlap, duplication and waste.	U	Deputy Administrator		

[1] C = Corrective action completed.
R = Recommendation resolved with corrective action pending.
U = Recommendation unresolved with resolution efforts in progress.

Office of Research and Development's Written Comments

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
RESEARCH AND DEVELOPMENT

MEMORANDUM

SUBJECT: Response to Office of Inspector General (OIG) Draft Management Alert No. OPE-FY17-0006 "EPA Should Promptly Reassess Community Risk Screening Tool," dated June 14, 2017

FROM: Robert Kavlock
Acting Assistant Administrator
Office of Research and Development

TO: Carolyn Copper
Assistant Inspector General
Office of Program Evaluation

The EPA's Office of Research and Development (ORD) welcomes the opportunity to review and comment on the OIG's draft Management Alert titled: "*EPA Should Promptly Reassess Community Risk Screening Tool*" (Project No. OPE-FY17-0006) (Draft Management Alert). We appreciate the thorough review conducted by OIG's investigators and an opportunity to provide this feedback. This response reflects ORD's understanding of OIG's planned changes to their final Management Alert version.

Of foremost concern to ORD is the perceived misclassification of the C-FERST report as a Management Alert. The U.S. EPA Audit Evaluation Management Manual 2750 defines Management Alert as the following: "convey significant, time-critical issues to agency management before completing the ongoing project (pp. 172)." The OIG's findings do not identify any issues that neither impact, nor cause risk to the public health or environment. Further, the OIG did not find any gross mismanagement of EPA resources, nor time-critical issues. Accordingly, and in second light – if a Management Alert is issued before a project is completed, ORD notes that C-FERST as referred to in the hotline complaint was completed and released in Sept 2016. There is new work planned on C-FERST, but that is a separate and new project.

Having noted the above, ORD acknowledges there are areas for improvement, but we want to emphasize that at its core the Community-Focused Exposure and Risk Screening Tool (C-FERST) is a research tool and the nature of research can change during its course of conduct. Immediately below are responses to the OIG's specific recommendations that are directed to ORD. ORD notes that recommendation 5 is addressed to the Deputy Administrator. In the attachment, we provide additional detailed comments with respect to statements in the Draft Management Alert.

Recommendation 1: Review the Community-Focused Exposure and Risk Screening Tool and develop an action plan with timeframes to address issues identified, including considerations on whether to retain the tool. If retained:

Response: *ORD agrees and since ORD does intend to retain this tool, we have provided responses to the additional recommendations below.*

Planned Completion Date: *September 30, 2019*

a. Develop metrics for measuring the tool's performance and establish a regular schedule for performance evaluations.
   Response: *ORD agrees. ORD has already initiated the development of performance metrics for C-FERST and other tools. ORD intended to have this be the topic for discussion and review by the BOSC which is now on hold pending appointment of new BOSC members. A completion date is therefore pending when the BOSC is formed and is able to advise ORD on recommendations for appropriate metrics.*

   Planned Completion Date: *September 30, 2018*

b. Survey users to obtain feedback on tool utilization and any needed improvements.

   Response: *ORD agrees and as was mentioned in previous discussions with OIG, is partnering with ECOS (Environmental Council of States) and ASTHO (Association of State and Territorial Health Organizations) as part of an MOA established with EPA April 2016 to survey state agencies.* (*This survey is targeted for FY2018.)*

   Planned Completion Date: *September 30, 2019*

Recommendation 2: Develop policies and procedures for planning, developing, implementing and monitoring the performance of web-based research tools. Policies and procedures could build on the draft guidance for web-based tools developed by the National Exposure Research Laboratory, and should ensure that any new Office of Research and Development research tool stems from a clear project proposal that includes ongoing monitoring metrics and outcome measures, and vetting to ensure there is a need and no overlap with other tools.

Response 2: *ORD agrees and will work with OEI and the Chief Information Officer to develop criteria to determine when a research tool should be subject to the agency's information technology requirements. ORD will use the criteria to review its new and existing major public interface research tools to determine the applicability of the agency's information technology*

requirements. In addition, ORD will continue improving its investment portfolio review process for IT investments as required under various laws, policies, and regulations including FITARA. ORD will expand its application development roadmap and checklist to require informing the Office of Science and Information Management (OSIM) before such projects are started and to report progress and expenditures on such development projects on a regular basis (at least annually or more frequent). OSIM will review and help the developers through the appropriate Life Cycle reviews throughout the project duration and ORD will regularly monitor performance of these web-based tools. This process is being developed and will be implemented starting FY 2018 and will be continuous.

Planned Completion Date: *September 30, 2018*

Recommendation 3: Review new and existing Office of Research and Development research tools to determine the applicability of the agency's information technology requirements.

Response 3: *ORD agrees and as stated in the response to recommendation #2: ORD will work with OEI and the Chief Information Officer to develop criteria to determine when a research tool should be subject to the agency's information technology requirements. ORD will use the criteria to review its new and major existing public interface research tools to determine the applicability of the agency's information technology requirements.*

Planned Completion Date: *September 30, 2019*

Recommendation 4: Work with agency offices responsible for other geospatial analysis tools to develop a decision support matrix for when to use certain tools and for what purposes.

Response 4: *ORD agrees that such a decision matrix is valuable and will work other offices, predominantly OEI on this effort. ORD has started to develop ORD controlled tools and will coordinate with OEI for a wider review in 2017 and 2018, with a final assessment by 3/31/2019.*

Planned Completion Date: *September 30, 2019*

Recommendation 5: Examine all of the EPA's web-based risk screening and mapping tools to ensure the need for each tool and to avoid potential overlap, duplication and waste.

Response 5: Regarding recommendation 5 addressed to the Deputy Administrator, it is ORD's opinion that the Review of C-FERST does not form a basis to recommend an agency-wide review of all risk based screening and mapping tools.

If you have any questions regarding this response, please contact Jennifer Orme-Zavaleta, PhD, Director, National Exposure Research Laboratory (NERL) at orme-zavaleta.jennifer@epa.gov .

Attachment

cc: Tim Watkins
Michael Slimak
Andrew Geller

Jerry Blancato
David Updike
Stefan Silzer
Deborah Heckman
Beatriz Cuartas
Maureen Hingeley
Bill Ocampo

Detailed ORD Comments on Draft OIG Management Alert: Community Risk Screening Tool (C-FERST)

ORD is providing the following comments and clarifications regarding the draft management alert prepared by the OIG. The information provided is generally organized in the order issues were raised in the draft OIG Alert.

Page 1: The public version of C-FERST "is different than its intended purpose."

It is correct that the scope and implementation of C-FERST evolved during implementation to address new information, needs, and capabilities with existing resources. The impetus for developing C-FERST (circa 2008) was 2-fold: (a) to help automate the Community Action for Renewed Action (CARE) step-by-step community assessment roadmap and provide easier access to information for following the roadmap, and (b) advance the science of community-level cumulative risk assessment. C-FERST was requested by the CARE program leads and Program/Regional Office partners, and the tool, as released, did meet the first objective and even included other community assessment roadmaps. With respect to the second objective, C-FERST was envisioned as a framework for developing and communicating cumulative exposure and risk science, as described in the following two papers.

- Zartarian et al. "*The Environmental Protection Agency's Community-Focused Exposure and Risk Screening Tool (C-FERST) and Its Potential Use for Environmental Justice Efforts."* American Journal of Public Health. 2011, Vol. 101, No. S1. http://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2010.300087
- Zartarian and Schultz, 2009, "*The EPA's human exposure research program for assessing cumulative risk in communities*." Journal of Exposure Science and Environmental Epidemiology (2010) 20, 351–358; doi:10.1038/jes.2009.20; published online 15 April 2009, http://www.nature.com/jes/journal/v20/n4/full/jes200920a.html

Page 1: Without metrics to measure performance against goals, it is unclear if C-FERST is being used for its intended purpose or, importantly, meeting user needs.

We agree that formal metrics could be more robust, but argue that C-FERST is being used for its intended purpose, and that the tool will gain users as it becomes more well known. Furthermore, we identified the difficulties and costs to systematically collect quantitative information about uses and users, including the need to OMB clearance for any data collections.

Informing potential users of C-FERST's capabilities is a major purpose for doing case studies, including joint applications with EJSCREEN. In addition, we described and provided examples of working with our Regional partners and their local agency, academic, and community partners. This allowed us to test the tool with real-world users and obtain and user feedback and recommendations in the publicly released version.

We provided OIG with the current QAPP, which describes our intent to continue outreach, identify partnerships, and work with our partners to obtain information about how the tools

(working with EJSCREEN) are used, user-feedback and recommendations for future developments.

ORD also notes that the Management Alert does indicate that some of the C-FERST users who were interviewed "expressed enthusiasm for the tool's capability and what it can do for communities." ORD views this as a positive indication of the potential for C-FERST.

Page 2: Related to this finding, ORD altered the original purpose of the tool during development without properly documenting this change" and "The change had to do with the claim that C-FERST would characterize cumulative risks to toxic substances. … While National Exposure Research Laboratory (NERL) officials verbally acknowledged this change to us, it was not documented in the C-FERST Quality Assurance Project Plan (QAPP)."

While in retrospect we agree documentation could have been better, attempts to document the evolutionary changes were made. ORD does note that Management Alert indicates that the C-FERST Quality Assurance Project Plans (QAPPS) did not document a change in purpose relating to the extent to which C-FERST addresses cumulative risk assessment. ORD also notes that the Management Alert states only the 2009 QAPP made a passing reference to cumulative risk and noted that the C-FERST prototype version did not yet include the ability to calculate cumulative risk. Therefore, the C-FERST QAPPs developed in 2009, 2013, and 2017 were actually consistent and never implied that the tool had the capability to calculate cumulative risk. For example, the purpose of the project as stated in the 2013 QAPP was "to continue development of the Community-Focused Exposure and Risk Screening Tool (C-FERST) and Tribal-Focused Environmental Risk and Sustainability Tool (Tribal-FERST), web-based GIS and information access toolkits to enhance screening-level community environmental health decision-making." This is consistent with the current version of C-FERST. The data and functions covered in the 2013 QAPP are the same as those included in the public release version. The QAPP was followed for the tool development and data updates. After the public release in 2016 and in response to new ORD guidelines for QAPPs and "laboratory notebooks" for all projects, the QAPP has been revised and an electronic notebook (OneNote) is being used to document decisions, research and products. ORD also notes that although how the tool is described has changed and how the tool is used may change, these changes do not necessarily require revision of the QAPP. Finally, ORD notes that the change from conducting cumulative risk assessment was properly documented in the responses to the peer review comments, and proposed in the SHC 2.62 Project Plan and Task 2.62.1.

Page 2: Related to this finding, "Our review of documentation related to the planning and development of C-FERST shows that a significant change occurred in the design objectives of the tool between when ORD released the prototype version (circa 2008) and the official launch of the tool in September 2016."

Both the external peer review and internal agency concerns identified the need to be clear about what was in the tool and what it could do. The earlier descriptions of C-FERST were about the concept and plans for the tool. However, we had to describe what was actually in the tool at the time of the public release.

Page 4: Related to this finding, "ORD did not develop a project proposal for the C-FERST prototype (circa 2008)."

ORD's project planning process has matured significantly since the inception of C-FERST. The proposed C-FERST project followed the ORD project/task planning review process at the time (pre- National Programs) for NERL/HEASD Task 21163. Numerous briefings on the C-FERST plan were given to ORD management, as well as briefings to solicit collaborative input from our CARE Program partners across EPA's program and regional offices (including senior leaders in OPPT and OW).

Page 4: Related to this finding, "While early presentations on C-FERST generally described ideas for the tool, we did not see evidence that ORD performed a systematic assessment of community needs for the tool."

The introductions in the following 2 publications, and references therein, document the systematic assessment.

- Zartarian et al. *The Environmental Protection Agency's Community-Focused Exposure and Risk Screening Tool (C-FERST) and Its Potential Use for Environmental Justice Efforts.* American Journal of Public Health. 2011, Vol. 101, No. S1. http://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2010.300087
- Zartarian and Schultz, 2009, *The EPA's human exposure research program for assessing cumulative risk in communities.* Journal of Exposure Science and Environmental Epidemiology (2010) 20, 351–358; doi:10.1038/jes.2009.20; published online 15 April 2009, http://www.nature.com/jes/journal/v20/n4/full/jes200920a.html

Page 4: Related to this finding, "ORD said the tool was developed with extensive input from EPA regional offices and communities but has not provided clear documentation from any EPA program office requesting the tool."

CARE partners requested that ORD develop an automated version of the CARE roadmap, and CARE leads in OPPT and OW, as well as ORD managers, were briefed early on about the collaboration. We also led regular C-FERST development calls with CARE Program and Regional Office partners in 2008, and the CARE program suggested ORD conduct several pilot studies in their communities of the beta version. CARE leads at the time assisted ORD with the three pilot studies as well as with seeking internal review across Program Offices for input on the prototype version of the tool. ORD can provide names of CARE collaborators on the early tool development calls if needed.

Page 5: Related to this finding, "One NERL scientist with experience in systems dynamics and decision science said that the tool was developed without coordination between the ecosystems and human health sides of ORD, and that C-FERST was developed before staff with spatial data experience heard about it."

ORD disagrees with this one individual's assessment. There were many ongoing discussions and

joint briefings as early as 2009 between the ecosystems and human health researchers, specifically regarding coordination of C-FERST and EnviroAtlas.

Page 5: "**C-FERST Overlaps with Other Agency Tools and ORD Has Not Described C-FERST's Unique Components"**

ORD disagrees with this assertion. While there may be overlap (as opposed to duplication in the Management Alert), there have been presentations, fact sheets, and Q&As describing how C-FERST is unique compared to EJSCREEN and other tools. The text in the OIG Management Alert summarizes some of the unique components:

> "In our assessment based on our interviews with EPA staff and others, C-FERST overlaps most closely with EJSCREEN. EJSCREEN and C-FERST have similar functions and capabilities for identifying environmental risks in a community. Both tools provide a combination of demographic and environmental data (see Table 1), and allow users to compare the data from their local community (census tract) with state-level data. Unique to EJSCREEN, users can look at Environmental Justice Indices (combinations of environmental and demographic information), based on percentiles, and narrow in on specific demographic information not available elsewhere (including by language, country of origin, age, etc.).
>
> Unique to C-FERST, users are able to access more specific environmental data (particularly from the National Air Toxics Assessment dataset), find detailed information on potential ways to mitigate the harms of specific environmental pollutants through C-FERST's Issue Profiles, and see examples and advice for how to plan a community-level project with C-FERST's CARE Roadmap. ORD and others, such as EPA's Office of Environmental Justice, described C-FERST and EJSCREEN as distinct and complimentary tools explaining that C-FERST provides "context to information that may be available from other sources" (*i.e.,* MyEnvironment or EJSCREEN). One EPA regional user remarked that the nuanced level of data that C-FERST provides is useful in their work. Other users of the tool explained that they use EJSCREEN first as a broad screening tool, and then move to C-FERST to hone in on more community-specific data."

One area of <u>apparent</u> overlap is with regard to maps. There are some map layers in common, since these are on EPA's GeoPlatform, and some that were developed specifically for C-FERST (e.g., the NATA service, including contribution of source categories).

ORD has worked with OEJ (EJSCREEN) and OAQPS (NATA) to communicate the similarities and differences between our tools (see attached 4 tool comparison for NATA.) These include a description of the "focus for each tool" (C-FERST, EnviroAtlas, and EJSCREEN), and complementary uses. Several agency and public presentations have included comparisons and examples for using EJSCREEN and C-FERST together.

ORD was and remains cognizant to avoid duplication and minimize overlap with similar tools. We have worked with EJSCREEN to identify opportunities for collaboration on outreach and training.

Office of the Administrator's Written Comments

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

July 3, 2017

OFFICE OF THE
ADMINISTRATOR

MEMORANDUM

SUBJECT: Response to Office of Inspector General Draft Management Alert: EPA Should Promptly Reassess Community Risk Screening Tool

FROM: Mike Flynn
Acting Deputy Administrator

TO: Patrick Gilbride, Director, Environmental Research Programs
Office of Program Evaluation
Office of Inspector General

Thank you for the opportunity to review and comment on the Office of Inspector General's draft *Management Alert: EPA Should Promptly Reassess Community Risk Screening Tool*. I appreciate the OIG's efforts to investigate hotline complaints and the OIG's commitment to preventing waste, fraud and abuse.

The OIG's draft *Management Alert* contains the following recommendation for the Deputy Administrator:

> Examine all of the U.S. Environmental Protection Agency's web-based risk screening and mapping tools to ensure the need for each tool and to avoid potential overlap, duplication and waste.

I agree that EPA's web-based risk screening and mapping tools should be developed to meet the targeted users' needs and, where possible, build on existing tools to avoid duplication and reduce waste. The EPA's Office of Environmental Information has mechanisms in place for coordinating mapping tools and data services across the agency. For example, OEI leads the EPA Geospatial Advisory Committee, which is the advisory board for the EPA's geospatial program

overall and has representation from almost all programs and regions. OEI also leads the GeoPlatform Change Control and Operational Management Board. Programmatic groups developing applications that use EPA's GeoPlatform shared service and/or new enterprise geodata services are invited to discuss issues like consistency and re-using shared services.

I have asked OEI and the Chief Information Officer to review their existing policies and procedures to ensure that sufficient mechanisms are in place to identify potential overlap or duplication during the development or modification of any web-based risk screening and mapping tools.

With respect to existing web-based risk screening and mapping tools, the agency has developed a 4-Tool Comparison Chart to guide users to the tool or tools that will best serve their needs. The chart includes C-FERST as well as EJSCREEN, NATA, and EnviroAtlas, and is available at https://www.epa.gov/ejscreen/epa-4-tool-comparison-chart.

Appendix C

Distribution

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