Technology Deliverables Guidance

Updated February 2024

Technology deliverables are web- and software-based interactive tools that help professionals understand and apply research results and come in a variety of forms (e.g., spreadsheets, websites, calculators, databases, etc.). Only certain projects justify the development of these products, which are often more costly and labor-intensive. Many factors need to be considered before developing a technology deliverable.

Technologies and platforms are continually evolving, but here is a current snapshot of the types of technology deliverables WRF may accept:

Type of technology deliverable	Does WRF accept?	Will WRF host?
Excel spreadsheet	Yes	Yes
Excel spreadsheet with macros	Yes	No
Website	Yes	Case-by-case basis, depends on platform and/or need for content updates
Interactive PDF, Video	Yes	Yes
Other (e.g., database, downloadable code)	Case-by-case basis	Case-by-case basis

Any project that will produce a technology deliverable (hereafter "deliverable") is required to complete and submit the Technology Deliverable Feasibility Form (hereafter "Technology Form") to The Water Research Foundation (WRF) to provide a clear road map for the deliverable. Regardless of who hosts the deliverable, certain criteria must be met for any technology deliverable that WRF is funding. The Technology Form includes the questions on page 3 of this document and must comply with the product requirements below. Completed Technology Forms should be submitted via JotForm.

Expectations

The #1 expectation is that researchers communicate with WRF **early and often, before** developing any deliverable. The following items should be discussed with the WRF RPM and Communications and Marketing team, and will be considered on a case-by-case basis:

- The type of deliverable the research team would like to develop

- Some deliverables may require hosting by the research team. In these cases, the project contract will include considerations for data hosting and ownership, including the location, provider, and ongoing data management (including backup/recovery)—see Exhibit G for more details.
    - Domain names and ownership of domain names are subject to discussion with, and approval by, WRF.
- How the user will interact with the deliverable; WRF expects them to be easy to navigate and respectful of user privacy
    - WRF prefers that deliverables not require user login/credentials or authentication. WRF's website has existing functionality to prompt for login before sending the user to the technology deliverable. Any other method of authentication requires a discussion to determine what might be allowed. If there is an exception, the research team will be responsible for implementing and supporting the end user.
    - Use of the deliverable should not require the installation of executable or add-on applications
- Whether data can/will be entered by users and/or saved and if saved, how that data will be secured
    - WRF does not allow deliverables to request or store personal information from users.

Once the Technology Form has been accepted and the deliverable has been approved, ongoing communication with the RPM and Communications and Marketing team should be conducted to successfully launch these deliverables.

General Requirements

- Technology deliverables must provide features and functionality that cannot be delivered in any other way.
- All technology and ongoing maintenance costs associated with a deliverable must be cost-justified (i.e., the benefit provided outweighs the costs).
- Deliverables should utilize commonly available technologies to the extent feasible and follow current security best practices to secure the deliverable and protect the end user.
- If a deliverable will be hosted by WRF, it **must** use common technology that does not require licensing. WRF does not provide maintenance of technology deliverables, nor does it provide third parties with administrator access to the WRF hosting platform.
- Deliverables should be designed such that only minimal ongoing maintenance is needed by the research team (WRF does not provide maintenance).
- Deliverables should not require end users to install third-party software, aside from commonly found enterprise software applications such as MS Office or Adobe Acrobat Reader.
- Deliverables must comply with applicable data privacy regulations (CCPA, GDPR, PIPEDA, etc.).
- Deliverables must comply with the WRF End User License Agreement.
- Deliverables should be designed to ensure ease of use for end-users and follow current best practices for user experience and/or website development.
- Applicable source code must be documented with in-line comments.
- Any encryption passwords should be provided to WRF.

- End user documentation such as technology requirements, a user guide, or FAQs must be provided in addition to the deliverable. These deliverables should include self-guided end-user training or support; individualized end-user training and support should not be required.
- All deliverables should reflect our visual identity standards by adhering to WRF's [Brand Guidelines](#).
- The deliverable must acknowledge WRF and additional co-sponsors when applicable (see next section for specific details).

Acknowledgment of WRF

- The product must mention the WRF project title and project number, and link back to the main project page on the WRF website.
- The WRF logo, sponsorship, and copyright information should be prominently displayed in the technology deliverable, for example on the title screen/page or footer:

<table>
<tr><td>Sponsored by:
The Water Research Foundation</td><td>Copyright ©2024
by
The Water Research Foundation
ALL RIGHTS RESERVED</td></tr>
</table>

- Include the standard disclaimer from the WRF [Research Report Template](#).
- If the project has co-funding organizations, their logos should be included alongside WRF's, and their names included under "Sponsored by" section and in the disclaimer.
- Contact the Communications and Marketing team (cm@waterrf.org) to obtain the WRF logo and logos of any co-funding organizations. Please specify how the logo is intended to be used and your preferred file format. For more information about proper use of the WRF logo, refer to WRF's [Brand Guidelines](#).
- If the technology deliverable is not hosted on WRF's website, it must include a link back to [www.waterrf.org.](http://www.waterrf.org)

Technology Deliverables Feasibility Form Questions - [Submit answers online via JotForm](#)

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The Technology Form will be used by WRF staff, researchers, and the Project Advisory Committee to determine whether the proposed deliverable is an appropriate fit for the project. Once a project team is chosen, the successful proposer should answer the following [Technology Form questions](#) to kick off additional discussion:

1. Detail the proposed features and functionality that can't be delivered in any other way, i.e., why is this deliverable needed?

2. Choose the type of deliverable that will be created. See specific Development Requirements per deliverable type further down in this form:

    MS Excel Spreadsheet (or similar)
    Interactive PDF
    Video
    Website
    Other, please describe:

3. Who will benefit most from the deliverable (e.g., utilities, regulators, academics, etc.?)

4. Describe what the deliverable will do. For example, is it primarily a data repository or will user interactions lead to a decision or analysis?

5. What will the deliverable's useful life be? What are the limiting factors for the deliverable's lifespan?

6. Will the deliverable need content updates during its lifespan? Further discussion will be needed and is dependent on the type of technology deliverable being proposed.

7. Provide a brief cost-benefit analysis of the proposed deliverable. Does the research team have the equipment, time, availability, and budget to create and test the technology deliverable? What is the anticipated level of effort, timeline, and cost for its development?

8. What degree of technical expertise will the user need to use the deliverable? Will users need guidance to use the technology deliverable? If so, what are you creating to meet that need? (e.g., FAQs, User Guide)

9. Please describe your plan for debugging, testing, and ensuring usability during development. Please note that all deliverables should be submitted to WRF as early as possible in the project life cycle to ensure adequate time for WRF to test and review.

If the proposed type of deliverable is either a Website or Other, please answer these additional questions:

10. Which technology platforms, programming languages, and/or systems will the deliverable utilize (please also include any third-party tools used to develop the deliverable, if applicable)? Can the deliverable be delivered to WRF as described under "Development Requirements for Website" below?

11. Will users need to enter any data into the deliverable? If so, how will this data be secured and protected from cybersecurity risks such as viruses, traffic interception, breaches, etc.?

12. If the deliverable needs to be hosted by the research team due to ongoing updates to the content or is built with technology WRF cannot support, review Exhibit G for hosting obligations

of the research team.

This entails keeping the deliverable current with software patches and/or maintenance. Associated costs should be referenced in the proposed project budget and may include the following:

a. Website hosting
b. Domain registration
c. SSL certificates
d. Up-front software licenses and annual maintenance OR annual subscriptions
e. Hardware and any other technology platforms required
f. Ongoing maintenance, patching, security updates, and backup/recovery

13. For deliverables hosted by the research team, what is the plan to secure the deliverable from cybersecurity threats over its expected life?

14. For deliverables hosted by the research team, how will it be managed to ensure compatibility over its expected life with the latest and at least one previous version of major browsers, plug-ins, or third-party software?

Development Requirements

MS Excel Spreadsheet (or similar)

- WRF will not host Excel files that use Macros. Macros are written in VBA and are susceptible to viruses. See Microsoft guidance and security changes that may impact the usability of the technology deliverable where IT departments block users from accessing files with Macros. https://learn.microsoft.com/en-us/deployoffice/security/internet-macros-blocked If the Research Team proceeds with macros, they will need to submit Exhibit G and host the technology deliverable themselves.
- Any passwords protecting sheets and/or cells should be provided to WRF

Interactive PDF

- Any passwords for security should be provided to WRF
- Any form functionality must enable the "Extend Features to Reader" users, i.e., the technology deliverable must not require users to purchase the full version of Adobe Acrobat

Video

- If the video is longer than three minutes, chapters should be built in to enable users to pause and/or resume where they left off
- Provide a format as either .mp4 or .mov for delivery on YouTube

Website

Folders and Filenames:
- All folders and filenames should be lowercase

- Use hyphens between words (instead-of-spaces)
- Avoid special characters (.!@#$%*)
- Shorter names reflecting the content of the page, such as "about-us", "faqs", etc., are generally better for user experience
- For images, use a name that reflects picture and be sure to include an "alt" tag describing the image for the visually impaired

Structure of Files:
All WRF-hosted, web-based deliverables become subsites on our web hosting environment.
- For ease of delivery to WRF for hosting, it is highly recommended that you build your deliverable with a structure as depicted in the image below for the different file types (Note: your deliverable may not have all these file types).
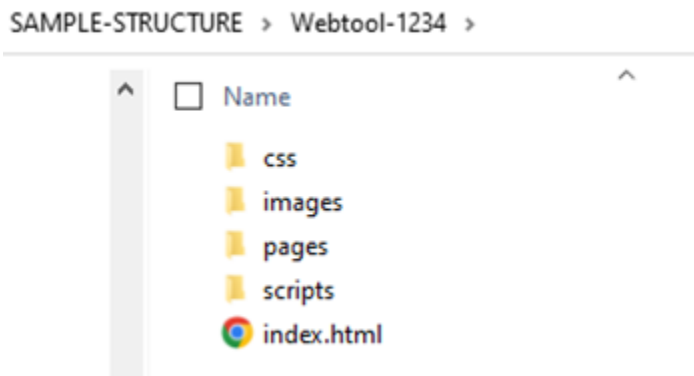
- WRF asks you to zip your files and provide that compressed file to your Research Program Manager. WRF will unzip your files and place them into a root folder that is often the project number.
- An "index.html" or "index.htm" page **is required** to be placed in your deliverable's root folder so it will be accessible from the web at webtools.waterrf.org/xxxx/. This will become your homepage. It may be an introductory page for the technology deliverable, or it may be the first page of your technology deliverable.
- The tool will be linked at the /[Project]/index.html level. This means any internal reference to "/css/some_file.css" needs to become "/[Project]/css/some_file.css."
- All file references within the codebase should be relative file paths (e.g., when importing main.css into the /html/page_two.html file, use "./../css/main.css" instead of "/css/main.css."

Footer or Header:
Your deliverable should include the WRF logo, adhere to our Brand Guidelines, and link back to WRF's website in either your deliverable's header or footer.

Other

Detailed and frequent conversations will ensure that other types of technology deliverables comply with requirements.