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# **FY23 Ecosystem Management and Restoration Research Program**

# **Project Record**

The Project Record is a living document – analogous to the Decision Management Plan used in the Corps Planning process. The Project Record is to be developed in parallel with the initial work unit documentation, and then updated 2 times per FY, in preparation for the IPR and RARG reviews, with the expenditure plan for the subsequent year being updated at the end of the FY. The purpose of the Project Record is multi-fold: 1) to serve as a tool for the researcher and program manager, informing the scheduling and smooth progression of the work, and documenting significant decisions or issues affecting the focus or outcome of the work, 2) to provide tracking and program accountability for project milestones and deliverables, 3) to document important achievements not part of the original work unit proposal and 4) to provide a communication plan of the value of the work through factsheets, videos, webinars, podcasts, social media (ERDC, District, other accounts), photos for EMRRP website, etc. List 1 item per quarter of each FY (4 per FY).

# Project Title:Integrating Environmental Considerations with Water Resource Simulations

# Reference SON: **Number and Title:** SON 2015-ER-5 Integrating Environmental Considerations with Water Resource Simulations

# **Lead PI:** Todd Steissberg

# Date of Update:October 4, 2022

# **Deliverables (include CW weekly submissions, videos, podcasts, social media posts, etc.)**

| Work Unit Major Deliverables/Tasks | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Task/Product** | **Milestones** | | **Status** | | **Remarks** |
| **Original Specified Delivery Date** | **Project Year** | **Percent Completion** | **Anticipated Delivery Date** |
| **(Qtr/FY)** | **(1,2,..n)** | **(%)** | **(Qtr/FY)** |
| Task 1: Water quality software design document | Q4/FY16 | 1 | 100 | Q4/FY16 | Complete and in review |
| Task 2: Water quality engine and HEC-ResSim unit test program with 1D water quality capabilities | Q4/FY17 | 2 | 100 | Q4/FY17 | Complete. Note: The original proposed task was an alpha version of HEC-ResSim with temperature capability only |
| Task 3: EL Water Quality libraries developed and ready to link with HEC-ResSim | Q3/FY17 | 2 | 100 | Q3/FY17 | Complete |
| Task 4: Beta version: HEC-ResSim with 1D temperature & eutrophication water quality capabilities | Q3/FY18 | 3 | 100 | Q1/FY20 | Contract delayed & increased level of effort. Development will be complete by December 31, 2019. |
| Task 5: Software tested and ready to deploy | Q4/FY18 | 3 | 100 | Q4/FY20 | This will be completed concurrently with Task 4. |
| Task 6: Software documentation prepared | Q4/FY18 | 3 | 100 | Q4/FY20 | This will be completed concurrently with Task 4. |
| Task 7: Deployment Version: HEC-ResSim with 1D temperature and eutrophication water quality simulation and analysis capabilities, with documentation, ready to post to HEC and ERDC-EL websites | Q2/FY19 | 4 | 100 | Q4/FY21 | The current Beta version is being used for studies and may be used by Districts. Several improvements are being implemented under contract with FY20 funds as well as supplemental funds from SCWA and possibly USBR |
| Task 8: Technical Transfer: Two-day water quality modeling workshop (HEC and ERDC-EL) | Q2/FY19 | 4 | 100 | Q4/FY20 | This task will be completed concurrently with Tasks 4 – 7 using the Alpha and Beta versions of HEC-ResSim. |
| Task 9: Technical Transfer: Documentation posted to HEC and EL websites, reports and papers prepared | Q2/FY19 | 4 | 100 | Q4/FY20 | This task will be completed concurrently with Tasks 4 – 7 using the Alpha and Beta versions of HEC-ResSim. |

# **Deviations**

| Significant Changes of Plan, Delays, Problems | | |
| --- | --- | --- |
| **Task/Product/Goals** | **Description of Change** | **Remarks/Justification/Impacts** |
|
|  |
| None | None | None |

# **Other Achievements**

| Big Wins/Other Significant Activities | | |
| --- | --- | --- |
| **Description** | **Qtr/FY** | **Remarks/Impacts** |
| The water quality libraries and components of the water quality engine were implemented for water quality modeling of the Columbia River watershed, in support of NWD’s Columbia River System Operation Environmental Impact Statement | Q3/17 | Total Dissolved Gas (TDG) simulation capability was added to address TMDLs for ecosystem management of the Columbia-Snake-Clearwater River watershed. Supersaturated TDG concentrations, which are caused by air entrainment in dam spillways, can induce gas bubble trauma in fish, leading to significant morbidity and mortality. |
| HDF5 interface libraries were built that can be used with Fortran, .Net (Visual Basic and C#), and Java. These libraries provide a user-friendly interface for exchanging data with HDF5 files. | Q4/17 | The new HDF5 interface libraries can be easily implemented to meet hydrologic and ecosystem modeling data needs. These will be used by HEC-ResSim, HEC-HMS, and HEC-RAS, and other programs to store and retrieve hydrologic and environmental data. |
| The Sonoma County Water Agency (SCWA) has selected the HEC-ResSim water quality software being developed during this work unit for water quality modeling of the Russian River and Lake Mendocino, in conjunction with the USACE Forecast-Informed Reservoir Operations project. | Q4/18 | * SCWA will provide $402k of funds for software and model development in FY19. Approximately $100k of these funds are for HEC-ResSim water quality software development. * These funds will supplement the EMRRP R&D funds to complete the software development and will also add new features, such as benthic algae simulation capability, which is needed by many projects.   This project will serve as the case study for the water quality modeling workshop and technical reports for the Technical Transfer portion of this work unit. |
| Presented new HEC-ResSim-WQ features at National Conference for Ecosystem Restoration (NCER), July 2021 | Q4/21 | Increased awareness of new capabilities |

# **~~Obligations and Expenditures~~ This is now documented in 2101s.**

# **(Optional) Mini-Project Management Plan**

The purpose of a Mini-PMP is to ensure active and effective ENGAGEMENT with the ERARG and appointed CoP lead, throughout the life of a project, enabling them to provide input to the direction of the work as it progresses and to the ongoing development of written products. A suggested format is provided below.

Subject to their interest and availability, ERARG members should have the opportunity to participate in regular project meetings/conference calls and to contribute to and/or review deliverables before they reach their final form. This will typically involve the ERARG member who acts as the proponent for a SON, or their designee, but may also include the submitter of the original SON and/or other ERARG members with relevant expertise and a specific interest in the project.

The Mini-PMP is a very simple framework of project-specific tasks/activities that should be developed with input and concurrence from the aforementioned ERARG members, delineating their specific contribution to the project and opportunities for involvement.

The Mini-PMP is not intended to be a comprehensive project planning document outlining the responsibilities of every member of the research team – although that level of planning should take place as part an ongoing project formulation process. It will be sufficient to focus the Mini-PMP to the agreed upon roles and responsibilities of the R&D Team as a group, and the individual ERARG and CoP members who will be directly involved with the project, recognizing that this may also evolve over time, necessitating updates to the PMP as the project progresses.

An example is provided; you may modify with tasks and activities relevant to your project, and expand or simplify as appropriate. The mini-PMP is intended to clearly delineate respective team roles and expectations. Like the Project Record itself, it may be necessary to make adjustments as work progresses and team makeup changes.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Mini-Project Management Plan (Example)** | | | | | | | |
| Task/Activity | Who | Org Element | Estimated Level of Effort | | | Approximate Execution Timeline | |
| Frequency | Hours | Total Man Days | FY/Qtr | Target Dates |
| Project PDT Kickoff Meeting | All PDT | All | N/A | 2 |  | FY18/2nd Qtr |  |
| Project PDT Progress Meetings | All ERDC/HEC PDT | All | BiWeekly | 2 | 9 | Ongoing |  |
|  | ERARG PDT Member | NAD | Quarterly | 2 | 3 | Ongoing |  |
|  |  |  |  |  |  |  |  |
| Literature Search | ERDC PDT | EEW/EPE | Ongoing | 80 | 10 | FY/2nd Qtr | 1-Feb thru 28 Feb |
|  |  |  |  |  |  |  |  |
| Outline – Technical Report | ERDC PDT | EEW/EPE | N/A | 40 | 5 | FY18/2nd Qtr | 1-Mar |
|  | HEC PDT | IWR | N/A | 40 | 5 |
|  | ERARG PDT Member | NAD | Initial | 2 | .25 |
|  |  |  |  |  |  |  |  |
| Preliminary Draft – Technical Report | ERDC PDT | EEW/EPE | N/A | 80 | 10 | FY19/2nd Qtr | 31-Dec |
|  | HEC PDT | IWR | N/A | 40 | 5 |
| Internal Review – Technical Report | ERDC PDT | EEW/EPE | N/A | 6 | .75 | FY19/2nd Qtr | 15-Feb |
|  | HEC PDT | IWR | N/A | 6 | .75 | FY19/2nd Qtr | 15-Feb |
|  | ERARG PDT Member | NAD | N/A | 2 | .25 | FY19/2nd Qtr | 28-Feb |
|  |  |  |  |  |  |  |  |
| Document Revision – Technical Report | ERDC PDT | EEW/EPE | N/A | 40 | 5 | FY19/2nd Qtr | 31-Mar |
|  |  |  |  |  |  |  |  |
| Formal Peer Review – Literature Search TR | Selected ERDC/HEC | TBD | N/A | 8 | 1 | FY19/3rd Qtr | 30-May |
|  |  |  |  |  |  |  |  |
| Final Document Revisions | ERDC PDT | EEW/EPE | N/A | 10 | 1.25 | FY19/3rd Qtr | 30-Jun |
|  | HEC PDT | IWR | N/A | 2 | .25 |
|  | ERARG PDT Member | NAD | N/A | 2 | .25 | FY19/4th Qtr | 15-Jul |
| Check of Edit | ERDC PDT | EEW/EPE | N/A | 2 | .25 | FY19/4th Qtr | 15-Sep |