Detachment Study

September 2023

The purpose of this document is to provide more detailed information on the Detachment Study that was identified in the 2017 Flexible Flow Management Program (FFMP2017). It is not meant to define, change, add, subtract, or limit any part of the FFMP 2017 agreement. This document was derived from the Salinity Study Scope of Work dated April 30, 2020 (https://www.nj.gov/drbc/about/advisory/RFAC_meeting_05142020.html) and meant to streamline the work as well as acknowledge work to be completed in the Synthesis Study initiated in the 2023 Amendment to the 2017 FFMP.

Introduction

FFMP2017 is a two-part, ten-year agreement, which builds on the experience gained over 10 years of similar programs. During the first five years, the Decree Parties agreed to study and investigate different aspects of the FFMP2017, assess their effectiveness, impacts, and benefits under current and future stressors, and evaluate alternatives for achieving the program's goals and objectives.

Three major issues are outlined in Sections IV.2 and IV.3 of FFMP2017: 1) detaching releases from the New York City Delaware Reservoirs from the position of the salt front during drought emergency; 2) increasing New Jersey's Diversion during all drought conditions; and 3) increasing or optimizing lower basin storage for flow augmentation (i.e., alternate operations, structural modifications, new infrastructure). These three studies will be evaluated in relation to estuary salinity, aquatic and fishery resources, water-supply availability for multiple purposes, flood mitigation, and projections of future sea level rise as well as topics identified in Section IV.6

In 1982, the Good Faith Agreement established a salinity vernier, attached to the location of the salt front, using minimum flow objectives for the Montague and Trenton gaging stations during drought emergencies. Under the Good Faith Agreement, the City of New York is responsible for sustaining the vernier at Montague through releases from its Delaware Basin Reservoirs.

Purpose and Scope

The purpose of this study is to evaluate the impacts and conditions resulting from detachment of releases from the New York City Delaware Reservoirs from the position of the salt front during drought emergency (detachment) and to replace the benefit that New York City releases have with respect to the salt front with an alternative methodology or methodologies that will provide comparable protection for existing resources within the Basin. Alternative methodologies for detachment will take into consideration ecology, habitat, natural resource conservation, as well as other metrics and will provide comparable protection to what is currently achieved through the vernier.

The Decree Parties seek to examine the foundation and efficacy of the salinity vernier as defined in the Good Faith Agreement and to identify and analyze alternatives for detachment. This study will specifically include:

- an evaluation of the salt front (its historical location and variability),
- the effect of projections of sea level rise on salinity under various conditions,
- impacts to the aquatic and fishery resources,
- and additional considerations as identified in Section IV.2 of the FFMP2017.

The Decree Parties recognize that this study will not answer all questions related to salinity in the Delaware River and that further analysis in the Synthesis Study will be required. The resulting analyses and conclusions from this study and the other FFMP2017 identified studies will be used to inform development of a subsequent flow management program.

Procedure

The following tasks outline the models and tools to be used to study the impacts of detachment on the Delaware River system and a process by which a baseline level of protection can be prescribed while alternatives can be identified and evaluated to achieve defined objectives. The tasks outlined below were excerpted from current studies, which are funded through a variety of sources. These studies will be leveraged to inform the Parties of the possible effects of detachment.

Public Input

As identified in FFMP 2017, this study will provide opportunity for interested stakeholders to receive study updates and provide comment back to the Decree Parties. The public input process is outlined in Attachment A of this scope of work.

Tasks

Model development and calibration. This task will provide the tools to use throughout the study and verify their ability to analyze detachment and other alternatives.

- All models that will be used (USGS - Coupled Ocean-Atmospheric-Wave-Sediment Transport (COAWST); DRBC 3D Salinity model (SM3D), developed with Environmental Fluid Dynamics Code; DRBC – Planning Support Tool (PST), and others) have gone through a calibration and validation process.
- Where possible, model outputs can be verified to ensure their applicability to the appropriate questions.
- A common set of drivers/forcings and shared data will be developed.

Metric Identification. This task will develop metrics for comparisons of model simulations and include evaluation of main stem flows, estuary salinity, and storage.

- A suite of meaningful metrics will be identified for the baseline and evaluation of alternatives and establishing program goals (e.g. number of drought days, location of salt front during a repeat of the 1960s drought, river recreational use, main stem and tributary fisheries habitat). Commissioners, Decree Parties, DPWG and stakeholders will be consulted to inform a final set of metrics.
- This task will be completed by DRBC with assistance from ODRM in coordination with DPWG and stakeholders.

Flow Management Alternatives Development. This task will develop a set of flow management alternatives with the DPWG and interested stakeholders to be simulated in the models. The alternatives will focus on how to maintain the current level of overall basin protection provided by the Vernier, also known as the L5 Montague Flow Objective.

- Ideas for alternatives will be developed to determine if the existing level of protection provided by the Montague Vernier can be replaced with new or modified operations or operational components or combinations thereof and a different L5 Montague Flow Objective, not linked with the salt front.
- This will be accomplished by the DPWG, facilitated, and advised by DRBC and ODRM, by holding several meetings to brainstorm ideas and then distill a list of alternatives for consideration.

Screening-level Modeling. Preliminary screening-level simulations will be conducted with DRB-PST by DRBC and presented to the DPWG. The DPWG will then be engaged in developing groups of alternative components to simulate in a second screening-level evaluation.

- DRB-PST will be used to evaluate the impact of selected alternatives on the Delaware River Basin and provide screening-level outputs on the impacts of selected alternatives.
- Based on the DPWG assessment of the outputs, additional scenarios will be evaluated by DRB-PST in a second round.

Contributing factors and mechanisms. Modeling simulations will be conducted by USGS and DRBC and presented to the DPWG focused on determining the main contributing factors or mechanisms that result in movement of salt front in upstream direction.

- USGS-COAWST was used to rate these factors in order of their importance and effects.
- Consideration will be given into how these factors can be utilized in the development of flow management alternatives.

Sea Level rise. Modeling simulations will be conducted with DRBC-SM3D and presented to the DPWG focused on the impact of sea level rise on the location and distribution of the salt front. This work will be completed by DRBC.

- Consideration will be given into how sea level rise will impact the effects of the proposed flow management alternatives.

Detailed Alternatives Analysis. Modeling simulations will be conducted with DRBC-SM3D to analyze refined flow management alternatives and to evaluate the 3d impacts on the estuary. This work will be completed by DRBC.

Reporting. Individual reports will come out by each researcher or agency as results are available from the previous tasks described in this document and as specified through their projects and funding sources. This information will be shared through the specified channels of the initiating project. Therefore, results and work may or may not be released before Decree Party negotiations occur.

Coordination and Communication

- Progress meetings with the DPWG and Team (DRBC, USGS, ODRM, USACE, DOE) will occur at regular intervals. In addition, meetings will occur to provide an opportunity for input and feedback on items such as, but not limited to, model assumptions and alternatives development.
- Meetings with RFAC, SEF and other stakeholders will occur to present draft study results and to solicit public input.

Attachment A:

Public Input Process for all FFMP 2017 Studies

A FFMP 2017 general study work plan was shared through the Delaware River Basin Commission's Regulated Flow Advisory Committee (RFAC) in April 2019 and includes statements regarding the use of RFAC to inform the public and solicit feedback on the FFMP2017 studies. The steps below provide additional details on the process and timelines for informing and involving the public in this study.

Initial RFAC/Public Review:

1. After the Decree Party Principals approve a draft Scope of Work (SOW) it will be shared with RFAC.
2. At the next RFAC meeting, a Decree Party(ies) or ODRM or DRBC will provide a summary presentation on the draft SOW followed by a question-and-answer session. RFAC will make the SOW available on the DRBC website (https://www.nj.gov/drbc/about/advisory/RFAC_index.html) at least 14 days before its meeting and accept public or individual RFAC agency comments for 14 days after.
3. RFAC will compile the comments and submit the package to the Decree Parties within 30 days of the meeting.
4. The Decree Parties will review the comments, revise the SOW if changes are deemed appropriate, approve a final SOW, and respond to RFAC and include a copy of the final SOW. The final SOW will be made available on the DRBC website (https://www.nj.gov/drbc/about/advisory/RFAC_index.html).

Annual RFAC/Public Updates:

5. The Decree Parties or ODRM or DRBC will provide a progress report including a meeting presentation and question and answer session to RFAC at least once per year on the status of the FFMP2017 studies.
6. Documents, video conferencing, websites, emails, etc may be utilized to provide more frequent sharing of status and results.
7. Study alternatives, metrics, scenarios or SOW can be adjusted as applicable based upon feedback received through email.
8. If the Decree Parties agree, results of phases, subtasks or partial recommendations or findings, or draft report sections may be shared with RFAC.

Final Report/Recommendations:

9. After the Decree Party Principals approve a final draft study report it will be shared with RFAC.
10. At the next RFAC meeting, a Decree Party(ies) or ODRM or DRBC will provide a summary presentation on the final draft study report followed by a question-and-answer session. RFAC will make the final draft study report available on the DRBC website at least 14 days before its meeting and accept public or individual RFAC agency comments for 14 days after.

11. RFAC will compile the comments and submit the package to the Decree Parties within 30 days of the meeting.
12. The Decree Parties will review the comments, revise the final draft study report if changes are deemed appropriate, approve a final study report, and respond to RFAC and including a copy of the final study report. The final study report will also be made available on the DRBC website (https://www.nj.gov/drbc/about/advisory/RFAC_index.html).