RiverView 3-Year Project Plan

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Table 1: All task timeline estimates provided were made by domain experts under the expectation of these approximate allocations. Allocation values correspond to percentage of a standard 40 hour workweek (e.g. 0.2 corresponds to 8hrs/week).

Task	**Sub-task**	**Year1 Sem1**	**Year1 Sem2**	**Year2 Sem1**	**Year2 Sem2**	**Year3 Sem1**	**Year3 Sem2**	**Personnel**
Task 1. Stakeholder engagement and applied science systems engineering	All	0.5	0.55	0.5	0.5	0.5	0.5	Stakeholder Engagement engineer
Task 2. Discharge remote sensing data preparation with uncertainty '	2.1. River discharge from single-sensor swath altimetry	0.10	0.10					River discharge scientist
	2.2. Lake storage change from single-sensor swath altimetry	0.65	0.65	0.75	0.75	0.75	0.75	Lake storage scientist
	2.3. River discharge from multi-sensor water extent	0.8	0.8	0.2	0.2	0.2	0.2	River discharge scientists
	2.4. River discharge from multi-sensor nadir altimetry	1.15	1.15	1.0	1.0			River discharge & Nadir altimetry scientist
Task 3. Numerical modeling	3.1 Runoff preparation with uncertainty	0.28	0.28					Hydrology Data scientists
	3.2. Refinement of uncertainty propagation and data assimilation	0.28	0.28	0.28	0.28	0.28	0.28	Hydrology Data Scientists
	3.3. Cloud implementation	0.28	0.28	0.78	0.78	1.28	1.28	Cloud implementation engineers
	3.4 Data production of simulations with uncertainty through DA			0.50	0.50	1.00	1.00	Data assimilation scientist
Task 4. Open science towards system sustainability & transferability	4.1 Software life-cycle	0.15	0.15					Software Life-cycle engineer
	4.2 Engagement with SWOT Science Data System	0.05	0.05					SWOT Engagement lead
PI		0.40	0.40	0.40	0.34	0.36	0.36	PI

TASK 1 Stakeholder Engagement

TASK 1.1 Evaluation of Stakeholder/Community Needs via Community Assessment Report

1.1.1 Identify all current/known stakeholders/end users, identify a point of contact for each. **Estimation:** 3 weeks. **Dependencies:** None.

1.1.2 Create an initial set of questions (Community Assessment Questions) to determine stakeholder use-cases, needs, wants, roadblocks, etc: identify key questions to determine what our stakeholders do, how they make decisions, how they fit into the RiverView project and outcomes, what their needs are, why they are/aren't being filled, whether we have an opportunity to fill them, how we can benefit them, where we could shape our product to support them. Aim to quantify and quality the gaps between their current process/practices/information and what we could provide to them. Set realistic expectations about what we may/may not be able to fulfill. **Estimation:** 3 weeks. **Dependencies:** Depends on 1.1.1.

1.1.3 Schedule and conduct interviews with stakeholder personnel, in real-time answering and discussing the Community Assessment Questions with the stakeholder. Take notes and record the meetings. We want to capture responses in their words: we may know the answers, but testimonials will help us communicate project value to HQ. **Dependencies:** Depends on 1.1.1. **Estimation:** 6 months. **Dependencies:** Depends on delivery of 1.1.1 and 1.1.2.

1.1.4 Synthesize the information from the interviews into a Community Assessment Report (CAR). This process may need to be iterated down the line, but our goal at this stage is to present an initial report of how this project can support the community. **Estimation:** 3 months. **Dependencies:** Depends on delivery of 1.1.3

TASK 1.2 Stakeholder Engagement Planning

1.2.1 Create Initial Stakeholder Engagement Plan. Plan includes information on who we will engage, the cadence on which we will engage them, the format we will use (written versus real-time communications, durations, etc). Describes in detail the type of information that

will be communicated. Cedric and other relevant team members should be consulted at this stage. Should include details on the Midterm Update and the end-of-project timeline update. Acknowledging that this might require iteration throughout the project, and should also include an understanding of how the document can be iterated. **Estimation:** 3 weeks. **Dependencies:** Depends on delivery of 1.2.1.

1.2.2 Communication with Stakeholders on Stakeholder Engagement Plan and establishment of any communications practices (e.g. if a virtual meeting series required, scheduling of a recurring meeting or e.g. if a forum required, creation of the forum). **Estimation:** 3 days. **Dependencies:** Depends on delivery of 1.2.1.

TASK 1.3 Ongoing Engagement

1.3.1 Adhere to periodic Stakeholder engagement activities outlined in 1.2.1. Provide any written reports and present at any meeting engagements. **Estimation:** Ongoing. **Dependencies:** None.

1.3.2 Attend and participate in any HQ-expected periodic engagement meetings/activities. Provide updates as needed. **Estimation:** Ongoing. **Dependencies:** None.

TASK 1.4 Midterm Engagement & Final Engagement

1.4.1 Create report and materials for midterm engagement update; Schedule the update and present it. Should give a comprehensive view of the progress of the project, the outcomes of prototypes, what is available as beta (if applicable) to stakeholders, and provide a clear path forward to completion. **Estimation:** 1 month. **Dependencies:** Depends on delivery of 1.2.1.

1.4.2 Create report and materials for a final engagement update at the end of the three year period Schedule and present. Should give a comprehensive view of what was completed, and tell the story of how it supports Earth science and water management, our stakeholder needs, etc. Should give a vision of what could come next in the future. **Estimation:** 2 months. **Dependencies:** Depends on delivery of 1.2.1.

TASK 2 Discharge Remote Sensing Data Preparation with Uncertainty

- **Intended Outcome:** Global SWOT discharge estimates at SWORD reaches, translated to MERIT Hydro for assimilation
- **Minimum Outcome:** If SWOT discharge product release is delayed, generate discharge from SWOT observations of height or width. Use a similar quantile mapping approach as Task 2.4.1 to relate SWOT observations to MeanDRS discharge simulations.
- **Contingency:** If SWOT discharge is only released for select validated rivers, provide RAPID with geographically-limited discharge for assimilation proof of concept
- **Overarching Dependencies**: Public release of global validated SWOT discharge (date unknown), Data retrieval pipeline in Task 2.4.2 if used, Publication of MERIT-SWORD dataset

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TASK 2.1 SWOT-based River Discharge

2.1.1 Develop an automated data pipeline for retrieving SWOT discharge estimates in real time at a pre-determined cadence. Can possibly leverage data retrieval pipeline developed in Task 2.4.2. **Estimation:** 3 weeks for local. 6 weeks for AWS implementation. **Dependencies:** None.

2.1.2 Quantify SWOT discharge uncertainty.

2.1.2A Derive uncertainty propagation equations to estimate the first and second uncertainty moments. This will likely be done for the MetroMan algorithm only. **Estimation:** 4 months. **Dependencies:** Must precede 2.1.7. Depends on the availability of SWOT discharge data.

2.1.2B Implement a simple method for deriving the width uncertainty based on the elevation – width relationships (hypsometric curves). **Estimation:** 2 months. **Dependencies:** None.

2.1.2C Encode the assumption that prior evaluation of systematic and random differences in DSWx-widths and SWOT widths can serve as estimates for SWOT width

systematic and random uncertainties. **Estimation:** 2 months. **Dependencies:** Depends on the availability of SWOT discharge data.

2.1.2D Contrast width uncertainties in items 2 and 3. Select the more promising method. **Estimation:** 2 months. **Dependencies:** Depends on 2.1.2C, must precede 2.1.7.

2.1.2E Collect coincident USGS streamgage stage and SWOT Water Surface Elevations (WSE). Compare SWOT WSE anomalies and USGS stage anomalies to estimate the Error Standard Deviation. Contrast that with estimates from the parameterized error model in Frasson et al. (2023). Adjust the model parameters to better estimate WSE and slope uncertainties. **Estimation:** 2 months. **Dependencies:** Depends on delivery of 2.1.1 and 2.1.3.

2.1.3 Identify optimal filtering strategy of SWOT observations to ensure high-quality discharge estimates. **Estimation:** 2 weeks (direct approach). **Dependencies:** Depends on availability of SWOT discharge data.

2.1.4 Prepare SWOT discharge estimates for assimilation into RAPID by transferring data from SWORD to MERIT Hydro using the MERIT-SWORD dataset. **Estimation:** 2 weeks for processing. An additional 2 weeks may be required if reprocessing SWORD v17 as well. **Dependencies:** Depends on 2.1.1 and 2.1.3 completed and fully implemented.

2.1.5 Prepare and hand off SWOT discharge product for integration into RAPID AWS framework. **Estimation:** 3 weeks. **Dependencies:** Depends on completion of all 2.1.1 to 2.1.4.

TASK 2.2 Lake Storage Change from Single-sensor Swatch Altimetry

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2.2.1 Identify set of standard filtering procedures to get reasonable SWOT elevation-area pairs and storage anomaly estimates. **Estimation:** 3 months. **Dependencies:** None.

- **Intended outcome:** A definition of parameters used for tuning; an untuned but defined model.
- **Minimal outcome:** Strong initial guess of parameter tuning and/or a systematic method to identify strong parameter tunings on the fly. Criteria/decision-tree for successful tuning defined.

2.2.2 Establish a method for quantification of uncertainty in observations and storage anomaly estimates. **Estimation:** 10 months. **Dependencies:** Depends on 2.2.1.

- **Intended outcome:** Utilize the measurement uncertainty of the SWOT lake product.

2.2.3 Apply Standard Filtering Procedures (2.2.1) and Uncertainty Quantification Method (2.2.2) to a set of largest reservoirs globally. **Estimation:** 5 months. **Dependencies:** Depends on delivery of 2.2.2.

- **Intended outcome:** Storage anomaly estimates for fuller set of reservoirs.
- **Minimal outcome:** Storage anomaly estimates for limited set of reservoir.

2.2.4 Compute discharge anomaly. This entails adding in upstream discharge from Largest Reservoirs Data Uncertainty (2.2.3) to determine downstream discharge. **Estimation:** 5 months. **Dependencies:** Depends on delivery of 2.2.3 and requires input modeled discharge from RAPID.

- **Intended outcome:** Discharge estimates for a set of largest reservoirs globally, ready for assimilation. Estimating 20 reservoirs.
- **Minimal outcome:** Discharge estimates for a limited set of 5 or more reservoirs.

TASK 2.3 River Discharge from multi-sensor water extent

- **Intended outcome:** Global OPERA DSWx HLS and Sentinel-1-derived discharge estimates at SWORD reaches, translated to MERIT Hydro for assimilation.
- **Minimal outcome:** OPERA DSWx HLS-derived discharge in single basin for proof-of-concept assimilation into model.
- **Primary dependencies:** Public release of global validated SWOT discharge (date unknown) for discharge rating curves, quantile mapping approach for discharge in Task 2.4.1, Data retrieval pipeline in Task 2.4.2 if used, Publication of MERIT-SWORD dataset.

2.3.1 Optimize current OPERA width workflow to improve computational efficiency to extend to sparse-global extent. Even with optimization, clumping OPERA imagery globally could require supercomputing resources. If global expansion computationally infeasible, explore sparse width computation (i.e. reduce number of nodes/rivers, clip raster to small subset of nodes for optimized clumping). **Estimation:** 6 weeks. **Dependencies:** None.

2.3.2 Identify suitable river reaches in the "SWORD of science" (SoS) that contain operational USGS streamgauges (this is indicated in SoS) and are not under the influence of a known dam (type 1 reaches). **Estimation:** 6 weeks. **Dependencies:** None.

2.3.3 Produce weekly mosaics for each of the potential locations identified in 2.3.1 from the beginning of the DSWx-HLS. Evaluate the residual cloud cover, assess if merging DSWx-S1 (available since September 2024) is needed. **Estimation:** 6 weeks. **Dependencies:** Depends on delivery of 2.3.1 and availability of DSWx-S1.

2.3.4 Compute river widths using the images produced in 2.3.2. Identify locations where river dynamics are visible. That is, a set of nodes within a reach with the maximum range in observed widths. **Estimation:** 6 weeks. **Dependencies:** Depends on the delivery of 2.3.2.

2.3.5 Retrieve USGS discharge at the locations with enough river width dynamics (2.3.3). Investigate relationship between observed widths and mean discharge within the DSWx aggregation window. This indicates the best possible discharge retrieval based on width. **Estimation:** 6 weeks. **Dependencies:** Depends on the delivery of 2.3.3 and availability of DSWx-S1.

2.3.6 If SWOT discharge is available, use it to calibrate power laws between discharge and width. If SWOT discharge is not available, alternatives are calibrating to SWOT priors in SoS, quantile matching to MeanDRS. **Estimation:** 6 weeks. **Dependencies:** None.

2.3.7 Propagate water detection uncertainty through width and discharge estimation. Quantify the discharge errors due to water detection uncertainty and to the use of a width-based power law using results from items 2.3.4 and 2.3.5 **Estimation:** 6 weeks. **Dependencies:** Depends on the delivery of 2.3.4 and 2.3.5.

2.3.8 Identify important locations around the globe where the width-based estimation of discharge is appropriate, according to width variability hotspots identified by Feng et al., 2022, and where they are useful. **Estimation:** 6 weeks. **Dependencies:** None.

2.3.9 Produce DSWx mosaics, create width time series and repeat Task 2.3.5 at such locations. **Estimation:** 6 weeks. **Dependencies:** Depends on the delivery of 2.3.5 and availability of DSWx-S1.

2.3.10 Develop a data pipeline for continuously retrieving OPERA DSWx imagery in real time. Can likely leverage data retrieval pipeline developed in Task 2.4.2. **Estimation:** 6 weeks. **Dependencies:** No dependencies.

2.3.11 Prepare DSWx discharge estimates for assimilation into RAPID by transferring data between SWORD and MERIT Hydro using the MERIT-SWORD dataset. **Estimation:** 6 weeks. **Dependencies:** None.

2.3.12 Prepare and hand off the DSWx-derived discharge product for integration into RAPID AWS framework. **Estimation:** 6 weeks. **Dependencies:** Depends on the delivery of 2.3.11.

TASK 2.4 River discharge from multi-sensor nadir altimetry

2.4.1 Obtain river discharge estimates at Merit reaches from multi-sensor nadir altimetry missions (Sentinel 3A/B, Sentinel6, JASON3 - possibly SWOT nadir for active missions and possibly historical assimilation with past missions e.g. ENVISAT) **Estimation:** 6 months. **Dependencies:** None for historical data. Future data depends on the availability of the intended datasets.

- **Intended outcome:** Delivery of that minimum + database performance: assimilating data sufficiently close between discharge altimetry data and in-situ.
- **Minimal outcome:** Beta-model utilizes Sentinel3A/B, Sentinel6, JASON3 - and historical assimilation with past missions e.g. ENVISAT.

2.4.2 Transition toward Task 3 by transforming height data into discharge for future (implementation of mission-agnostic pipeline delivered as a Python script that automatically/periodically queries dynamic database and retrieves height, then queries static database to obtain parameters to transform river height into discharge) to retrieve river height data from hydroweb.next and transform it into discharge in the assimilation module. Once we get water height from the website we can transform it into discharge. **Estimation:** 1 month. **Dependencies:** Depends on the availability of hydroweb/next. Depends on the delivery of 2.4.1.

2.4.3 Re-deliver the Python script or AWS lambda from task 2.4.2 with the ability for automated query. **Estimation:** 1 month. **Dependencies:** Depends on the delivery of 2.4.2.

TASK 3 Numerical Modeling

TASK 3.1 Runoff preparation with uncertainty

3.1.1 Create a pipeline to download and prepare for VIC model: GLDAS download for world including Mississippi (1980-2014). At this stage, download for the entire world but implement for the Mississippi basin. **Estimation:** 3 months. **Dependencies:** Depends on availability of GLDAS 2.0.

3.1.2 Downloaded individual files and combine them into single file for each month for VIC. **Estimation:** 3 months. **Dependencies:** Depends on completion of 3.1.1.

3.1.3 Update models to change from GLDAS 2.0 to GLDAS 2.1 (not accumulate). Modify variable extraction code to adapt to differing format in GLDAS 2.1. **Estimation:** 3 weeks. **Dependencies:** Depends as 3.1.2.

3.1.4 Extend the model from VIC implementation to CLSM and NOAH. **Estimation:** 6 weeks. **Dependencies:** Depends on CLSM and NOAH data availability. Depends on completion of Task 3.3 and Task 3.1.3.

3.1.5 Extend the model from Mississippi implementation to global. If contingency needed, this step can be skipped. **Estimation:** 6 weeks. **Dependencies:** Depends on the delivery of 3.3.2, 3.3.3 and 3.1.4.

TASK 3.2 Refinement of uncertainty propagation and data assimilation.

3.2.1 Build a synthetic use-case. Define a sandbox domain: Documentation about what datasets will be considered part of this use case and what they are, and those datasets themselves provided together. **Estimation:** 3 months. **Dependencies:** None.

3.2.2 Forward-running discharge simulation: draft RAPID2 using Python, basic simulation capabilities. Established a base set of tools in RAPID2 and recreate them for RAPID2. **Estimation:** 6 months. **Dependencies:** Depends on delivery of 3.2.1. Task must include:

- Implementation of math & data pipeline to ingest data into models.

- Validation within the sandbox: Will be successful if one can perform a forward discharge simulation over some time period of the sandbox domain data.

3.2.3 Uncertainty propagation: Propagate uncertainties through time and report them. **Estimation:** 5 months. **Dependencies:** Depends on the delivery of 3.2.2. Task must include:

- Implementation of math & data pipeline to ingest data into models and implementation of an algorithm for the covariance matrix initialization and propagation in time.
- Validation of the implementation within the sandbox: Will be successful if one can perform a forward uncertainty propagation over some time period of the sandbox domain data.

3.2.4 Data assimilation. **Estimation:** 5 months. **Dependencies:** Depends on the delivery of 3.2.3. Task must include:

- Implementation of the algorithm for assimilation of noisy observations, leveraging simplified computation of the Kalman-filter operator.
- Validation of the implementation within the sandbox. Will be successful if one is able to produce corrected (operator-applied) water inflow to rivers that match those used to create the observations. Verify that simulations match observations from the noisy observation assimilation above.

3.2.5 Test on larger domain: Mississippi basin dataset. Ensure that simulations become closer to observations after running this analysis to completion. **Estimation:** 3 months. **Dependencies:** Depends on the delivery of 3.2.4.

TASK 3.3 Cloud Implementation

- **Intended outcome:** Iterative improvements to cost and resource efficiency of the extended RAPID2 model. Strong prototype and early implementation of full cloud-based system.
- **Minimal outcome:** Delivery of an acceptable prototype of the cloud implementation which can be used to further implement the 3.1 Tasks.

3.3.1 Prototype the cloud implementation. **Estimation:** 7 months. **Dependencies:** None.

3.3.2 Verify that the first cloud implementation is successful with Earth access updates. **Estimation:** 2 months. **Dependencies:** Depends on delivery of 3.3.1.

3.3.3 Create a cost analysis of current implementation **Estimation:** 1 month. **Dependencies:** None.

3.3.4 Improving, tuning, bullet-proofing cloud implementation (iterative process). **Estimation:** 1 year. **Dependencies:** Depends on the delivery of 3.3.1 and 3.3.3.

TASK 3.4 Data production of simulations with uncertainty through data assimilation

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3.4.1 Data Assimilation implemented for uncertainty models in 3.1: VIC, CLSM, NOAH. Aiming for global: contingency Mississippi only. **Estimation:** 6 months. **Dependencies:** Depends on the delivery of 3.1.4.

3.4.2 Run the simulations: calculate uncertainty using assimilated model from 3.4.1: ensure that outputs look reasonable/meaningful, despite room for accuracy improvement: aiming for 20-30%. (Note that Task 3.2 validates this). **Estimation:** 1 week. **Dependencies:** Depends on the delivery of 3.2.3 and 3.4.1.

3.4.3 Data Production: Running the simulations with the GLDAS 2.1 dataset 2000-2024 and data assimilation: aiming for global, but will utilize Mississippi as contingency. **Estimation:** 1 month. **Dependencies:** Depends on the delivery of 3.4.1 and 2.4.2.

TASK 4 Open Science Toward System Sustainability & Transferability

TASK 4.1 Software Lifecycle

4.1.1 Development of Open Science Guidelines for RiverView: deliver a document outlining project expectations to not rely on proprietary or non-public software (with the exception of SWOT integration or similar JPL-specific initiatives), project expectations to not rely on any subscription-based software, project expectation to be conducted publicly as Open Science via Github, inclusion of Open Science collaborative expectations (e.g. code of conduct). Description of CI/CD expectations, testing expectations, tools for version control, software development processes and standards. **Estimation:** 3 months. **Dependencies:** None.

4.1.2 Development of Software Lifecycle Management Plan - documented plan detailing the development and release processes, testing pipelines, and maintenance strategy **Estimation:** 2 months **Dependencies:** None.

4.1.3 Github repository established with CI/CID pipelines, code quality enforcement, and README/CONTRIBUTING/LICENSE files. **Estimation:** 2 months. **Dependencies:** Depends on beta-delivery of Tasks 2 and 3, expected at the 18 month mark. Depends on delivery of tasks 4.1.1 and 4.1.2.

4.1.4 Evaluation of each subtask within Tasks 2 and 3 on their adherence to the Open Source guidelines developed for RiverView in 4.1.1 and 4.1.2. **Estimation:** 2 months **Dependencies:** Depends on beta-delivery of Tasks 2 and 3, expected at the 18 month mark. Depends on 4.1.1 and 4.1.2.

4.1.5 Adherence of all subtasks to Open Science Guidelines in 4.1.1. **Estimation:** 5 months **Dependencies:** Depends on delivery of 4.1.4.

4.1.6 Creation of public tools for navigating/socializing RAPID: demos, website, user guides; aiming for the creation of these by delivery of beta models noting iterative work down the line throughout the project. **5** months. **Dependencies:** Should be done leading up to the 18 month mark for whatever deliverables we have available; no strict dependencies.

4.1.7 Coordinate with VEDA, Earth.gov, and DAAC teams to ensure data product pipelines are reproducible and interoperable for the 18-month prototype **Estimation:** 3 months, leading up to the 18-month mark. **Dependencies:** Depends on delivery of 4.1.5.

4.1.8 Coordinate with VEDA, Earth.gov, and DAAC teams to ensure data product pipelines are reproducible and interoperable for final deliverable of project products.**Estimation:** 3 months, leading up to 36-month mark. **Dependencies:** Depends on delivery of 4.1.5.

TASK 4.2 Engagement with SWOT Science Data System

4.2.1 Identify and create a report of "low-hanging fruit" for SWOT SDS integration. Report should include a list of identified SDS potential activities, estimated resources needed to complete each infusion activity, a description of each infusion activity, potential benefits/outcomes of the activity (aiming to quantify value), potential steps for infusion, the personnel or roles associated with each. **Estimation:** 3 months. **Dependencies:** None.

4.2.2 Collect and synthesize data product specifications across the project. **Estimation:** 5 months. **Dependencies:** Depends on characterization of data inputs and outputs of each subtask delivering algorithms. Should include:

- Diagram of the system and its architecture/components
- Identification of RiverView algorithms, their steps, and data flow through each and through the system comprehensively. (known as PGE's in SWOT). Create written plan for:
  - RiverView and RAPIDs model code in Docker containers
  - Algorithm packaging
  - Structure of AWS Lambda to Docker
  - Reproducibility, versioning
- Characterization variables used across the system
- Characterization all metadata and metadata specifications
- Identification of all data formats used and shipped.

4.2.3 Define production rules, namely anc/aux and conditionals for each subtask. **Estimation:** 5 months. **Dependencies:** Depends on delivery of 4.2.2.

- Codify the conditionals needed for each algorithm delivered by subtasks; collect into

production plan.

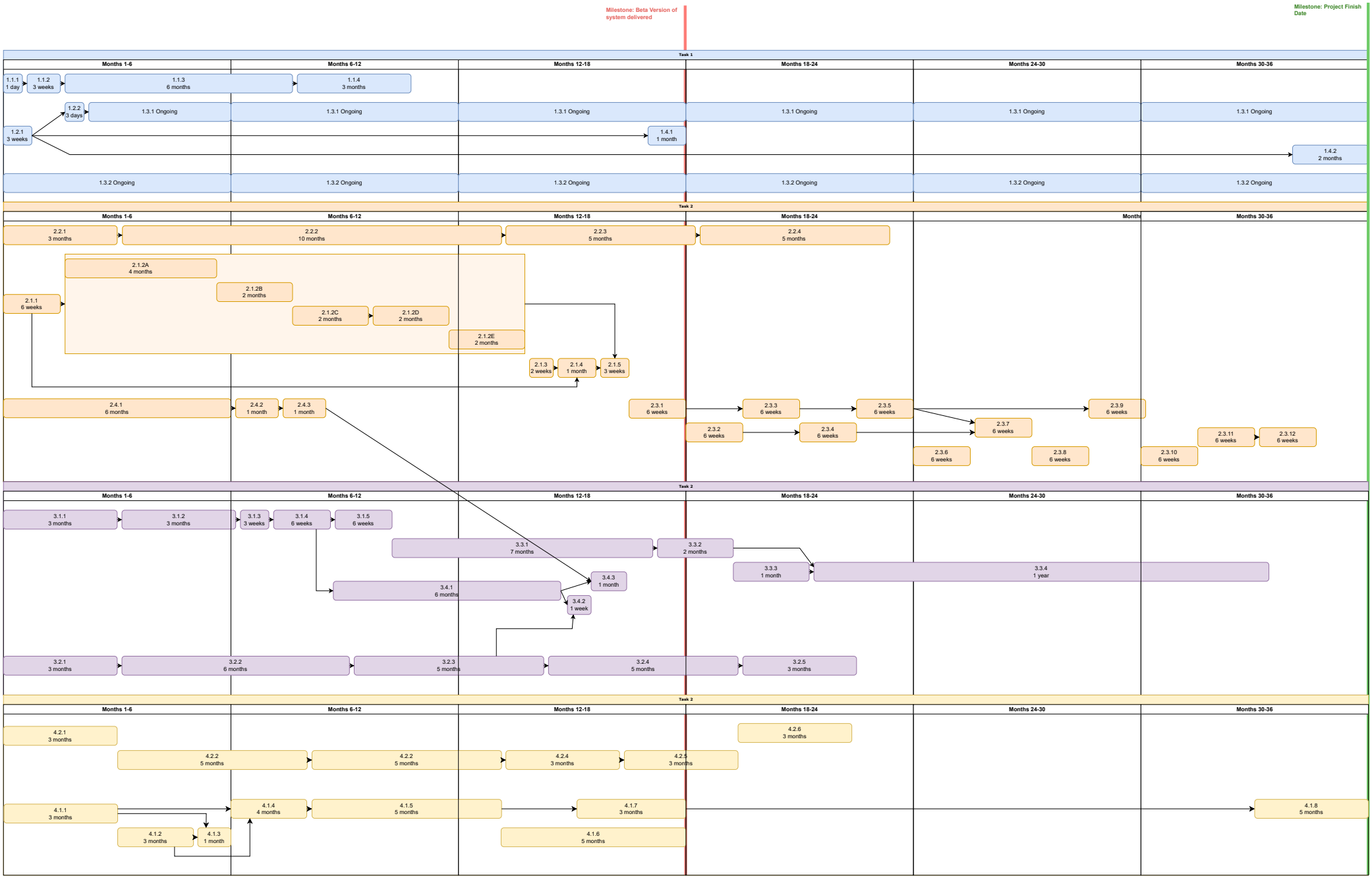
- Translate this codification of conditionals into a description useful for socializing RiverView products with SWOT team and collaborators.

4.2.4 Create compute resource estimate based on algorithm runtime, SWOT input data needs, estimated data output volume for DAACs. Present a brief report. **Estimation:** 3 months. **Dependencies:** Depends on delivery of 4.2.3.

4.2.5 Create a comprehensive cost estimate: data product cost estimates of processing the estimates of river discharge, river storage, lake storage changes, etc. Characterize project-proposed cost estimate (e.g. costs if the project proceeds directly as outlined); identify opportunities for cost improvement. **Estimation:** 3 months. **Dependencies:** None.

4.2.6 Conduct DAAC discussion. **Estimation:** 3 months. **Dependencies:** None.

- Identify a set of participants
- Develop a set of questions / an agenda to determine and characterize how RiverView's data products (estimates of river discharge, river storage, lake storage changes) align with DAAC.
- Host meeting with DAAC personnel and generate writeup of current alignment status and future alignment opportunities.


Milestone: Beta Version of system delivered
Milestone: Project Finish Date
Task 1
Months 1-6
Months 6-12
Months 12-18
Months 18-24
Months 24-30
Months 30-36
1.1.1 1 day
1.1.2 3 weeks
1.1.3 6 months
1.1.4 3 months
1.2.2 3 days
1.3.1 Ongoing
1.2.1 3 weeks
1.4.1 1 month
1.4.2 2 months
1.3.2 Ongoing
Task 2
2.2.1 3 months
2.2.2 10 months
2.2.3 5 months
2.2.4 5 months
2.1.2A 4 months
2.1.2B 2 months
2.1.1 6 weeks
2.1.2C 2 months
2.1.2D 2 months
2.1.2E 2 months
2.1.3 2 weeks
2.1.4 1 month
2.1.5 3 weeks
2.4.1 6 months
2.4.2 1 month
2.4.3 1 month
2.3.1 6 weeks
2.3.3 6 weeks
2.3.5 6 weeks
2.3.9 6 weeks
2.3.2 6 weeks
2.3.4 6 weeks
2.3.7 6 weeks
2.3.11 6 weeks
2.3.12 6 weeks
2.3.6 6 weeks
2.3.8 6 weeks
2.3.10 6 weeks
Task 2
3.1.1 3 months
3.1.2 3 months
3.1.3 3 weeks
3.1.4 6 weeks
3.1.5 6 weeks
3.3.1 7 months
3.3.2 2 months
3.3.3 1 month
3.3.4 1 year
3.4.3 1 month
3.4.1 6 months
3.4.2 1 week
3.2.1 3 months
3.2.2 6 months
3.2.3 5 months
3.2.4 5 months
3.2.5 3 months
Task 2
4.2.1 3 months
4.2.6 3 months
4.2.2 5 months
4.2.2 5 months
4.2.4 3 months
4.2.5 3 months
4.1.1 3 months
4.1.4 4 months
4.1.5 5 months
4.1.7 3 months
4.1.8 5 months
4.1.2 3 months
4.1.3 1 month
4.1.6 5 months