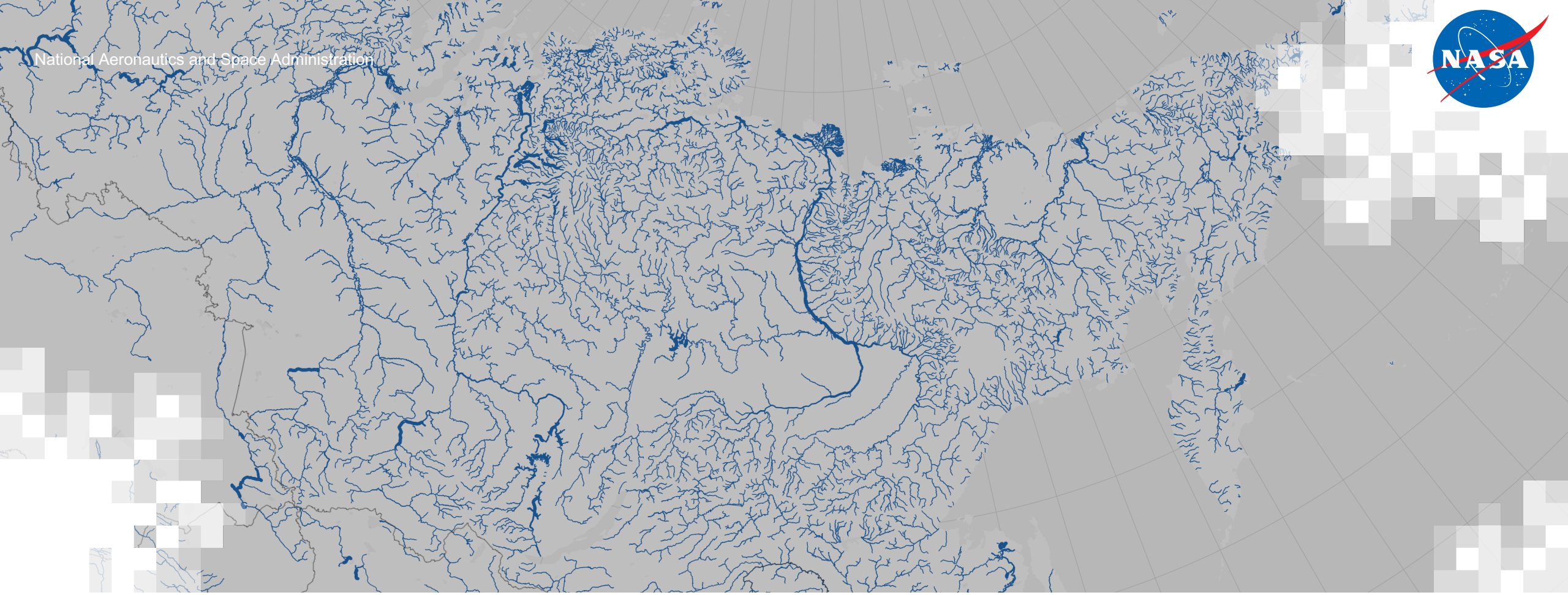


Using Earth Observations to Monitor Water Budgets for River Basin Management II

Amita Mehta and Sean McCartney

July 28, 2020

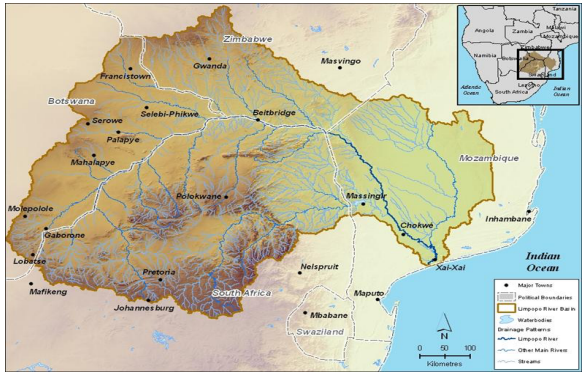
Training Outline

21 July 2020

https://svs.gsfc.nasa.gov/4493

Review and Access of Earth Observations and Earth System-Modeled Data for River Basin Monitoring and Management

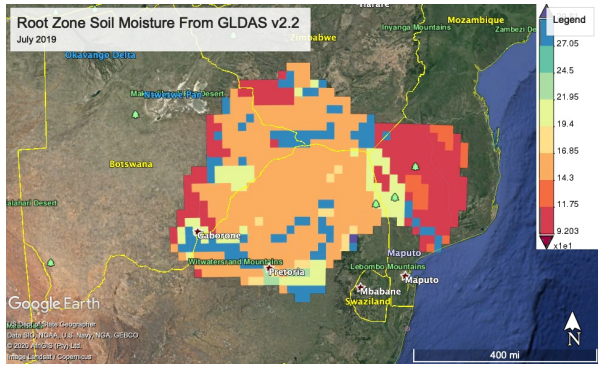
28 July 2020



http://www.limpopo.riverawarenesskit.org/

Water Budget Estimation using Remote Sensing Observations

4 August 2020



https://giovanni.gsfc.nasa.gov/

Water Budget Estimation using Global Land Data Assimilation Model

Objectives

- Replicate the steps for estimating seasonal water budget components for a river basin and sub-basins using remote sensing products, QGIS, and spreadsheet software
- Understand the source of uncertainties involved in estimating water budgets for river basins

Training Format and Certificate

- Three 2-hour sessions, each with:
  - Part 1: Presentations and demonstrations of data access, calculations, and analysis
  - Part 2: Lab time with hands-on, computer-based exercises
- Homework Assignments will be available after all three sessions from: https://arset.gsfc.nasa.gov/water/webinars/water-budgets-river-basin
  - Answers must be submitted via Google Form
  - Due Dates: 11, 18, and 25 August 2020
- A Certificate of Completion will be awarded to those who:
  - Attend all webinars
  - Complete all homework assignments
- You will receive a certificate approximately two months after the completion of the course from: marines.martins@ssaihq.com

Prerequisites

Attendees that do not complete the prerequisites will not be adequately prepared for the pace of the training.

- Fundamentals of Remote Sensing
- Introductory Webinar: Using Earth Observations to Monitor Water Budgets for River Basin Management
- Introductory Webinar: Groundwater Monitoring using Observations from NASA's Gravity Recovery and Climate Experiment (GRACE) Missions

Register on NASA Earthdata

- **https://earthdata.nasa.gov/**

Install the Latest Version of QGIS (currently v3.14)

- **https://qgis.org/en/site**

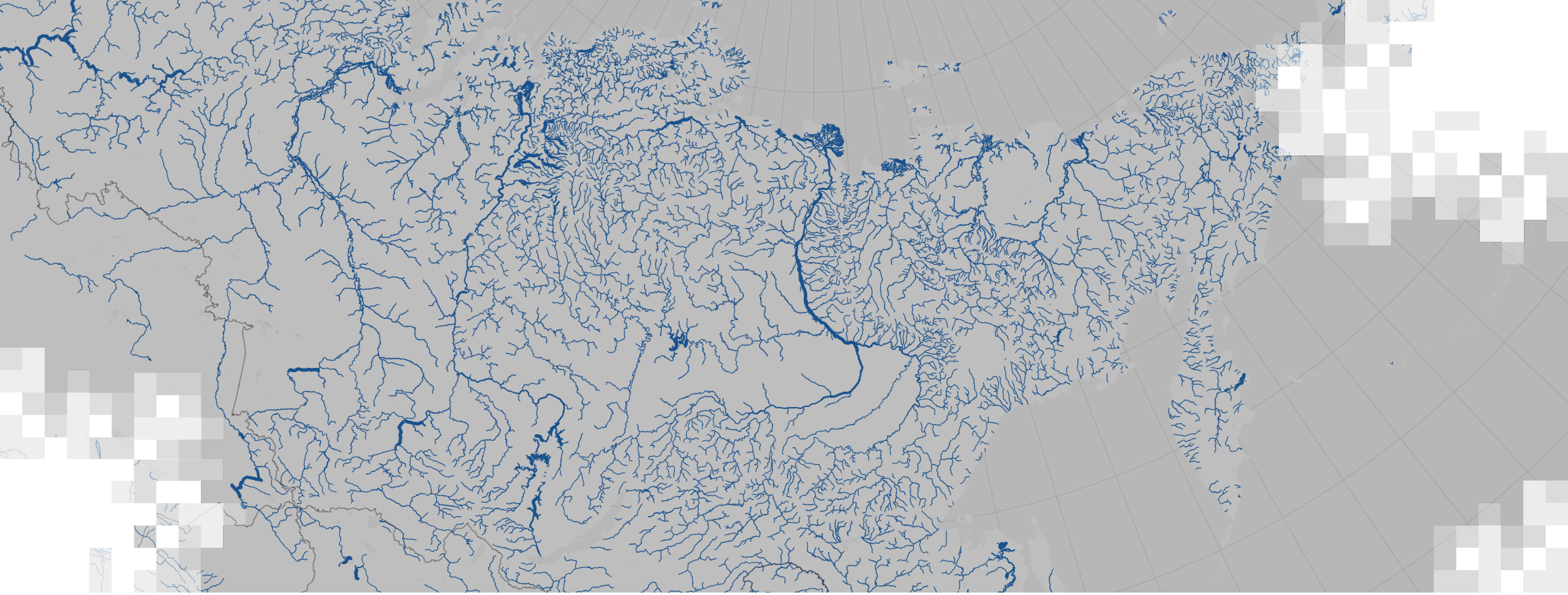
Additional Relevant ARSET Webinars

- Introductory Webinar: River Basin Delineation Based on NASA Digital Elevation Data
- Advanced Webinar: Applications of GPM IMERG Reanalysis for Assessing Extreme Dry and Wet Periods

Part 2 Outline

- Summary of Part 1
- Demonstration: Estimate seasonal water budget components for the Limpopo River Basin and sub-basins for 2016 using *remote sensing products, QGIS, and spreadsheet software
- Lab time: Replicate the steps to estimate seasonal water budget components for the Limpopo River Basin and sub-basins for 2019 using remote sensing products, QGIS, and spreadsheet software

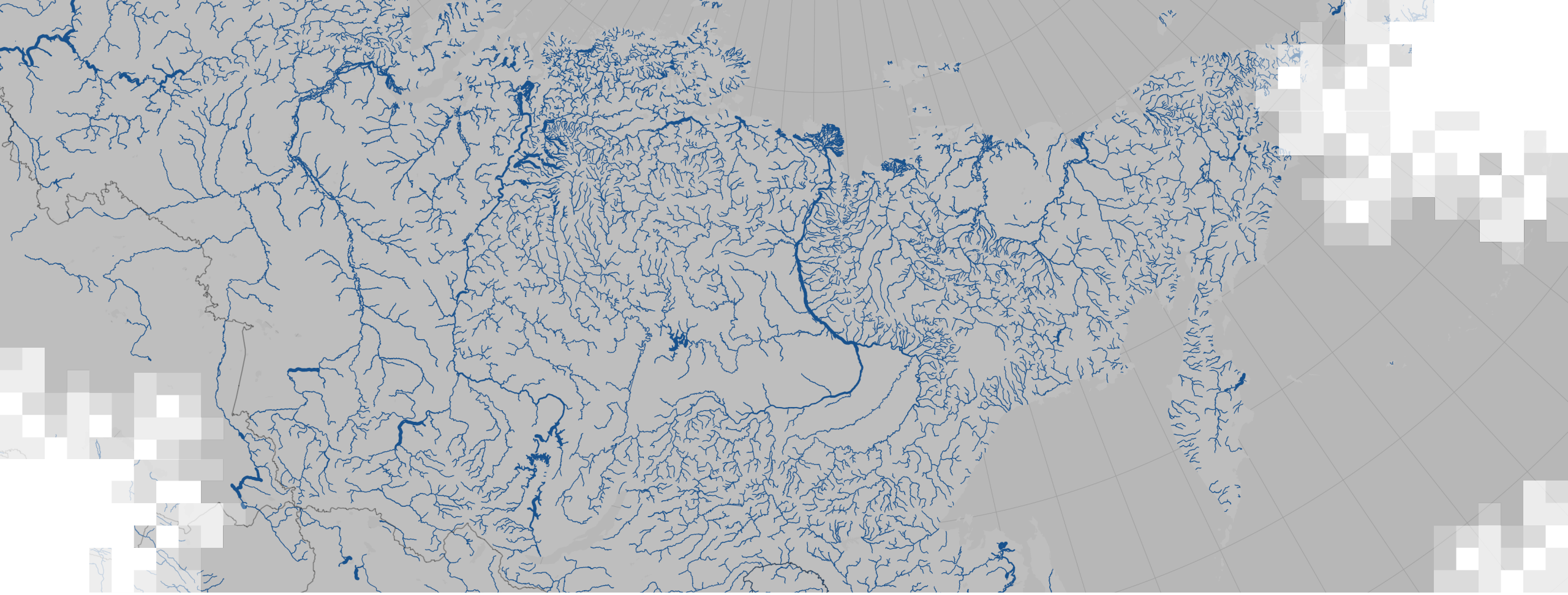
* GPM-IMERG Precipitation, MOD16 Evapotranspiration, and GRACE Terrestrial Water Storage Change



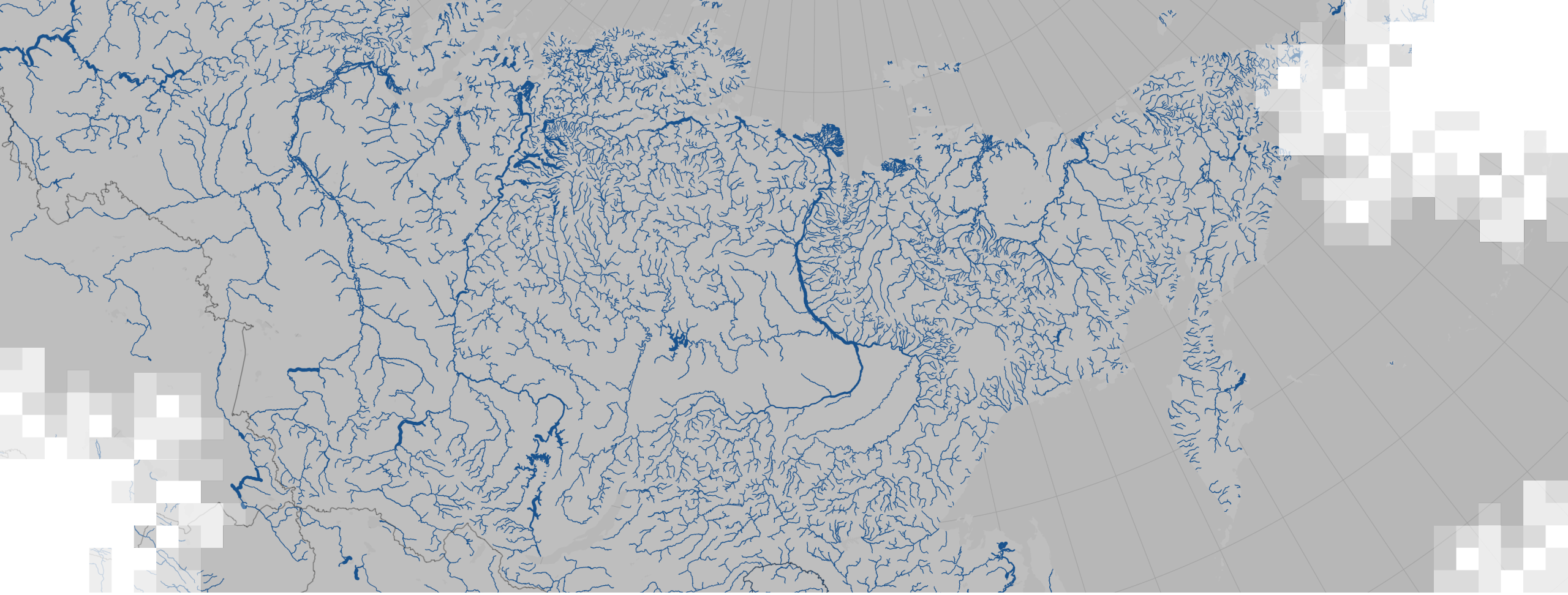
Summary of Part 1

Summary of Part 1

- Defined a river basin and discussed the importance of river basin management
- Identified components in the watershed contributing to the flow
- Explained the water budget equation for estimating water budgets in a river basin
- Reviewed remote sensing and GLDAS data for water budget estimation
- Demonstrated how to download remote sensing and GLDAS data for the Limpopo River Basin for the wet and dry seasons in 2016
- Organized a lab time to download remote sensing and GLDAS data for the Limpopo River Basin for the wet and dry seasons in 2019



Demonstration -
Estimate seasonal water budgets for the Limpopo River Basin and sub-basins for 2016



Lab Time -
Estimate seasonal water budget components for the Limpopo River Basin and sub-basins for 2019

Lab time

- Please enter your questions in the Q&A box.
- We will address your questions as we receive them and post answers to the training website:

  https://arset.gsfc.nasa.gov/water/webinars/water-budgets-river-basin

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- Sean McCartney: sean.mccartney@nasa.gov

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Dr. Benjamin Zaitchik (Zaitchik@jhu.edu)