**Description:**

The Water Supply Stress Index Model (WaSSI) is a web-based tool that can be used to project the effects of land use change, climate change, and water withdrawals on river flows, water supply stress, and ecosystem productivity (i.e., carbon sequestration dynamics) across the conterminous United States, Mexico, Rwanda, and Burundi. As water yield and carbon sequestration are tightly coupled, WaSSI is useful for evaluating trade-offs among management strategies for these ecosystem services.

The core of WaSSI is a water balance model that is sensitive to land cover and climate and operates on a monthly time step at the 8-digit Hydrologic Unit Code (HUC) watershed scale across the conterminous US, at a 0.5 degree grid resolution in Mexico, and at the watershed scale in Rwanda and Burundi. Gross ecosystem productivity, ecosystem respiration, and net ecosystem carbon exchange are estimated using actual evapotranspiration. For the US, annual US Geological Survey (USGS) water demand estimates are adjusted for population, disaggregated to the monthly scale, and compared to groundwater and surface water supply to assess water supply stress. Consumptive water use is subtracted from stream flow throughout the river network.

**Who Should Use WaSSI**?

Resource managers for making informed management decisions in light of changing environmental conditions; educators, researchers, NGOs, and the general public for gaining insight on the effects of global change on water and carbon at both local and continental scales.

**Appropriate Use**

WaSSI water and carbon predictions are subject to similar uncertainties associated with all ecosystem models, including uncertainty in input data, uncertainty in the representation of the physical processes that govern the watershed water balance and ecosystem productivity, and uncertainty in how people use and manipulate water resources at the continental scale. WaSSI is designed to provide large-scale global change impact assessments using readily available data collected using consistent methodologies across broad regions (e.g., water use and return flow). As a result, model results at the local scale (e.g., HUC8 watershed) may vary from actual conditions, and users are cautioned to consider this uncertainty in interpreting results for their watershed of interest. WaSSI users have the capability of evaluating an unlimited number of climate, land use, and water use scenarios and are ultimately responsible for determining whether the scenarios they define are realistic or not. For evaluating impacts of future climate scenarios, users are encouraged to consider several general circulation model and emission scenario combinations to cover a range in possible impacts. Users may refer to peer-reviewed WaSSI documentation for further information regarding model assumptions and limitations.

**Download the WaSSI User guide from the website to get a detailed description of the simulations possible and the science behind the model.**

**Model Run Request**

Complete the form below and email to Erika Mack: emack@fs.fed.us

Date: Click here to enter a date. Name: Please type your name.

Email address: Please type your email address. Affiliation: Choose an item.

Name of affiliation: Please type the name of the company.

Intended use of data: Short description of your intended use of this data.

**Scenario Request:**

You may select up to 3 different climates to be run per request form.

Mexico Climate Option 1: Choose an item.

Mexico Climate Option 2: Choose an item.

Mexico Climate Option 3: Choose an item.

Rwanda Climate Option 1: Choose an item.

Rwanda Climate Option 2: Choose an item.

Rwanda Climate Option 3: Choose an item.

US Climate Option 1: Choose an item.

US Climate Option 2: Choose an item.

US Climate Option 3: Choose an item.

Climate option 1: Enter climate run start year. Enter climate run end year.

Climate option 2: Enter climate run start year. Enter climate run end year.

Climate option 3: Enter climate run start year. Enter climate run end year.

Output parameter(s):

Water balance Water supply and demand(US Only) Ecosystem productivity

Output Time Step and Format:

Monthly; tabular only Annual; tabular only Average Annual; geospatial (shapefile)

Watershed boundary dataset; circa 2009 (shapefile)

**Caveat:**

**Our model utilizes the circa 2009 version of the USGS watershed boundary dataset. Many of the HUC numbers and boundaries from 2009 are different from the most current version of the WBD dataset. Any outputs from WaSSI should be mapped using the circa 2009 version of WBD.**