Overview
The goals of this partnership between EPA and the USGS are to develop and disseminate estimates of future hydrologic parameters (e.g., streamflow, run off, snow water equivalence, and soil moisture) for the rivers and streams of the coterminous US. The timeframe of focus is 2020 – 2100, in monthly time steps.

To date, the USGS national Monthly Water Balance Model (MWBM), upon which the initial core modeling is done, has been converted from a gridded format to one based on over 110,000 NHD-derived Hydrologic Response Units (areas on the landscape that would be expected to have a similar hydrologic response to changes in factors such as precipitation and temperature), the model has been calibrated for the entire continental US domain based on USGS stream gage data, outputs from over 220 climate model-greenhouse gas emission scenario combinations have been run to provide a broad array of plausible future climate projections, and a web portal developed to facilitate dissemination of findings to the public. Multiple papers either have been published or are being prepared for publication in the peer-reviewed literature describing project components and an entire session at a recent American Water Resources Association conference was dedicated to the project.

Phase I of the project is scheduled for completion in 2016 with the launch of the web portal, which USGS will host. Next steps include expanding the climate modeling projections to additional USGS water models (enabling examination of parameters such as stream temperature) and forming partnerships with key Federal, State/Tribal, and private stakeholders to facilitate using Hydrology Futures’ projections. Potential applications of project findings include vulnerability assessments to identify areas expected to experience the greatest climate change-related stress to drinking water supplies, wetlands, water quality via nutrient pollution from runoff, crop production, and forest health via increased wildfire risks.

Sample Products
Below are snapshots of a typical query process and sample products from a beta version of the web portal:

1) Select area of interest from map provided, choose a baseline time period, choose the hydrologic variable(s) of interest
2) Select climate modeling runs of interest, e.g. all model runs using the A2 emissions scenario

3) Example products