Model Name: Klamath Basin Planning Model (KBPM)

Organization: USBR
Model Name: Water Resources Integrated Modeling System (WRIMS)
Timestep: Daily
Spatial Structure: Klamath Basin
Data Available: Data not specified

Notes

Purpose and Background: The KBPM has been used since 2009 and is based in the Water Resources Integrated Modeling System (WRIMS). Its purpose is to simulate various operational alternatives to manage water effectively in the Klamath Basin, especially following the removal of dams in the Klamath Hydroelectric Project, which necessitated changes in compliance points for water management.

Model Versions: The current version used for the re-consultation effort is known as the Keno Release Model (KRM). This version changes the downstream compliance point from the USGS gage below Iron Gate Dam to the USGS gage below Keno Dam.

Operational Strategy: The KRM includes a flexible modeling system that allows for the implementation of operational alternatives. It simulates water operations under a range of hydrologic conditions, providing insights into how water will be allocated for irrigation and environmental needs.

Forecasting and Hydrologic Condition Tracking: The model tracks hydrologic conditions in the Upper Klamath Basin using a Normalized Wetness Index (NWI), which expresses the hydrologic status from dry to wet. This index helps determine water management decisions throughout the year.

Water Allocation and Delivery Simulations: The KBPM simulates agricultural deliveries and water allocations based on projected inflows to Upper Klamath Lake. This includes the use of various forecasting models to predict water availability for irrigation.

Model Outputs: The outputs from the KRM provide information on lake levels, river flows, and diversions for irrigation and wildlife refuges. This helps stakeholders understand the implications of various operational scenarios

Integration with Other Studies: The KBPM incorporates findings from studies on natural flow and sedimentation in the Klamath River Basin, ensuring that its simulations reflect the latest scientific understanding.

Future Improvements: The model is intended to evolve, with ongoing evaluations of its forecasting capabilities and operational assumptions to enhance its accuracy and effectiveness

Scenarios: FFA

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The Keno Release Model (KRM) is a critical component of the 2024 Klamath Project Operations Biological Assessment, designed to simulate and manage water operations in the Klamath River Basin, particularly following the removal of several dams in the Klamath Hydroelectric Project. Below are key details about the KRM:

Purpose: The KRM is developed to assess compliance with Klamath River flow requirements, particularly for managing releases from Keno Dam, which has become the new reference point for assessing these flows after the dam removals

Model Structure: The KRM is based on the Klamath Basin Planning Model (KBPM), which has been in use since 2009. This version of the model allows for the implementation of operational alternatives in simulations and focuses on tracking hydrologic conditions and water storage in Upper Klamath Lake (UKL

Key Variables:
- **Normalized Wetness Index (NWI)**: This index measures the hydrologic status of the Upper Klamath Basin and is used in decision-making for water management
- **UKL Status Index:** This index tracks the storage condition of UKL, which is crucial for managing water releases.
- **Operations Index**: A combined metric from NWI and UKL Status that is used to guide water management decisions.
- **Flexible Flow Account (FFA)**: The KRM implements an FFA operation where a portion of water targeted for release to the river in the fall and winter is stored in UKL for use in the spring. This allows for flexibility in water management and helps to meet irrigation demands during critical periods

Daily Flow Regime: The model establishes a daily River Base Flow (RBF) regime for releases from Keno Dam, which specifies the lowest flow targets and allows for adjustments based on hydrological conditions.

Accretions and Diversions: The KRM accounts for various sources of water, including inflows from the Lost River, which can impact the overall water available for management and irrigation.

Monitoring and Adjustments: Reclamation is committed to monitoring conditions using various gaging stations and will make operational adjustments to ensure compliance with the modeled outcomes.

Forecasting: The KRM uses seasonal forecasts of net inflow into UKL to determine allocations for project irrigation, adjusting based on hydrological conditions each year.

Simulated Outcomes: The KRM provides simulations of expected outcomes for UKL levels and Klamath River flows under different scenarios, which are essential for planning and management.

Environmental Considerations: The model incorporates environmental thresholds for federally-listed species and aims to balance agricultural needs with ecological requirements