



Preliminary Susitna River Pre-Project and Post-Project Flow Stages

Prepared by  **MWH**

Technical Work Group Meetings

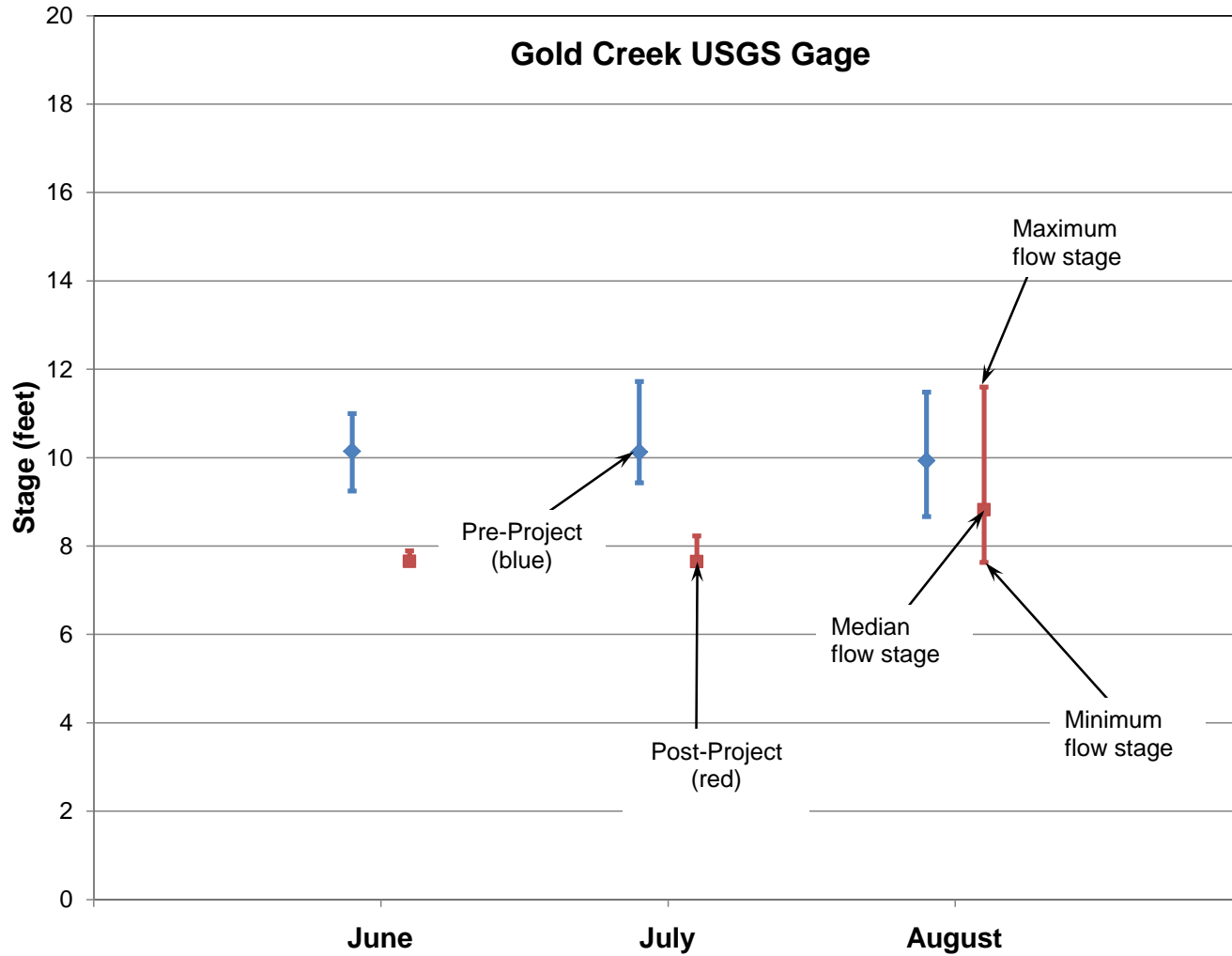
October 23-25, 2012



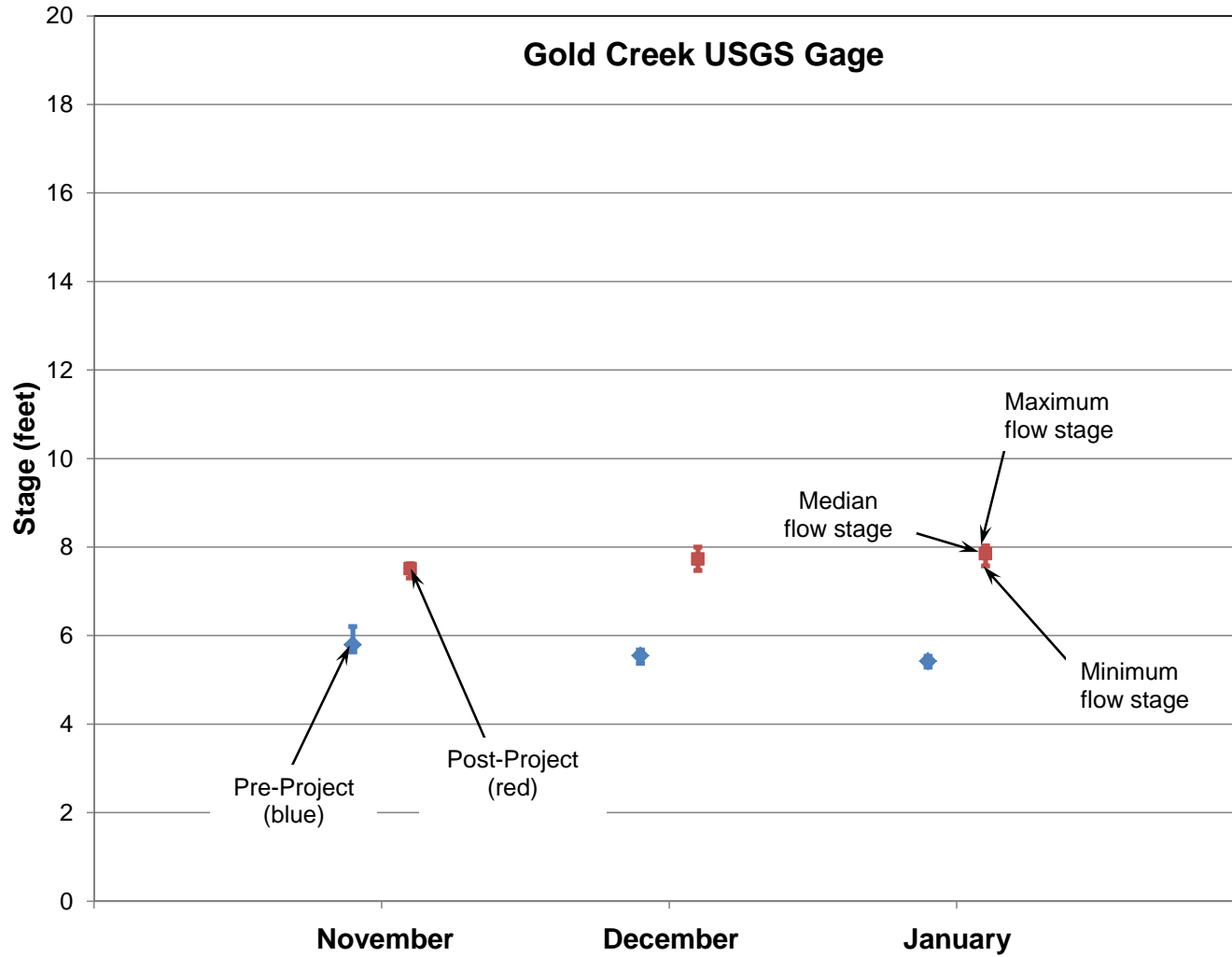
Downstream Stages – Daily Flows w/o Routing

- Based on daily historic recorded flows from May 1981 through June 1986
- Applies incremental daily flow changes at El 2050 Watana Dam at three downstream USGS gages
- No downstream flow routing (slides with routing follow)
- Plots of downstream flow hydrographs
- Stage range plots
- Median flow stage is 50% flow exceedance
- Maximum flow stage is 10% flow exceedance
- Minimum flow stage is 90% flow exceedance
- Common stage plotting axis to facilitate visual comparisons among the stations
- Assumes Watana takes all Railbelt load-following

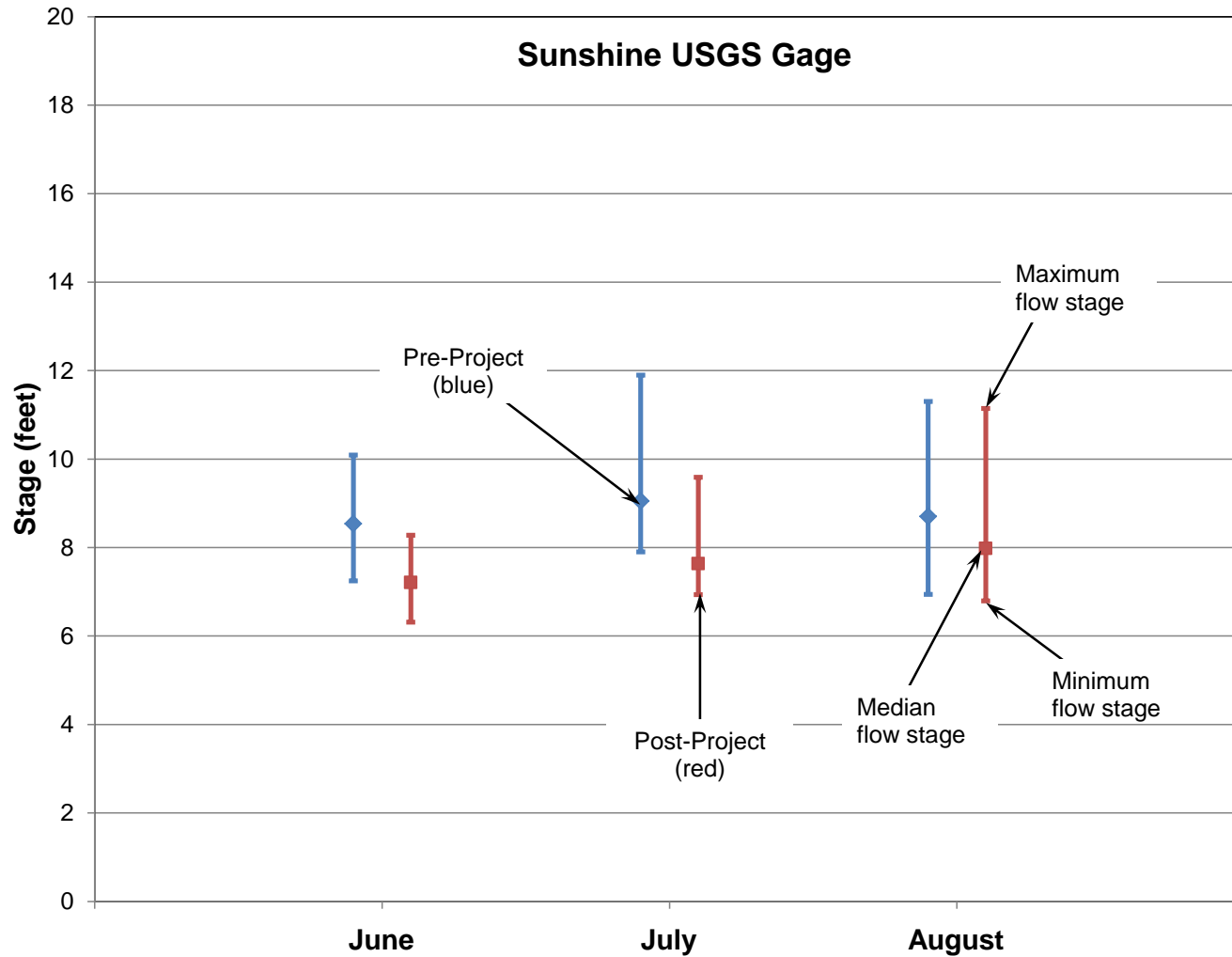
Gold Creek – Summer Stages



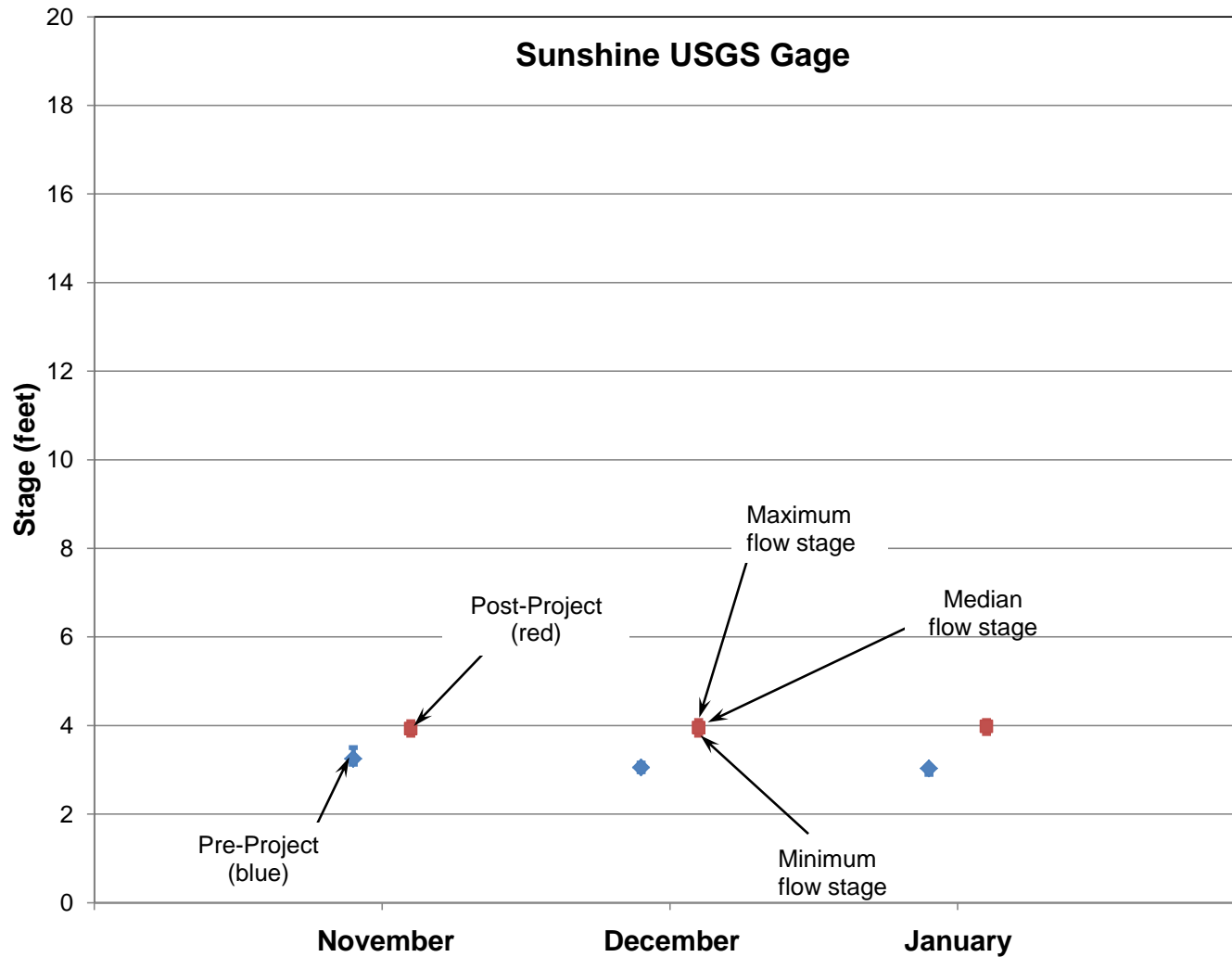
Gold Creek – Winter Stages



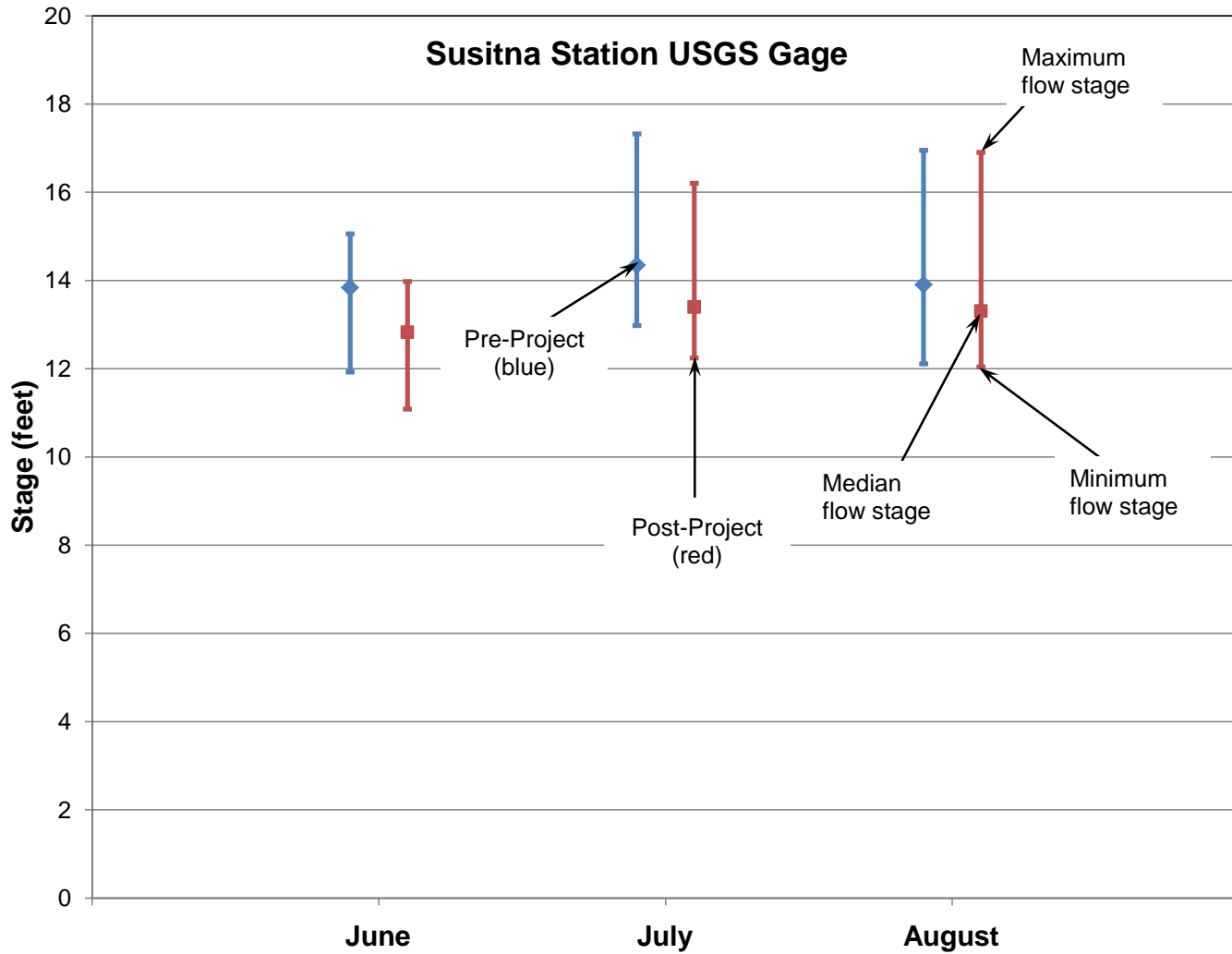
Sunshine – Summer Stages



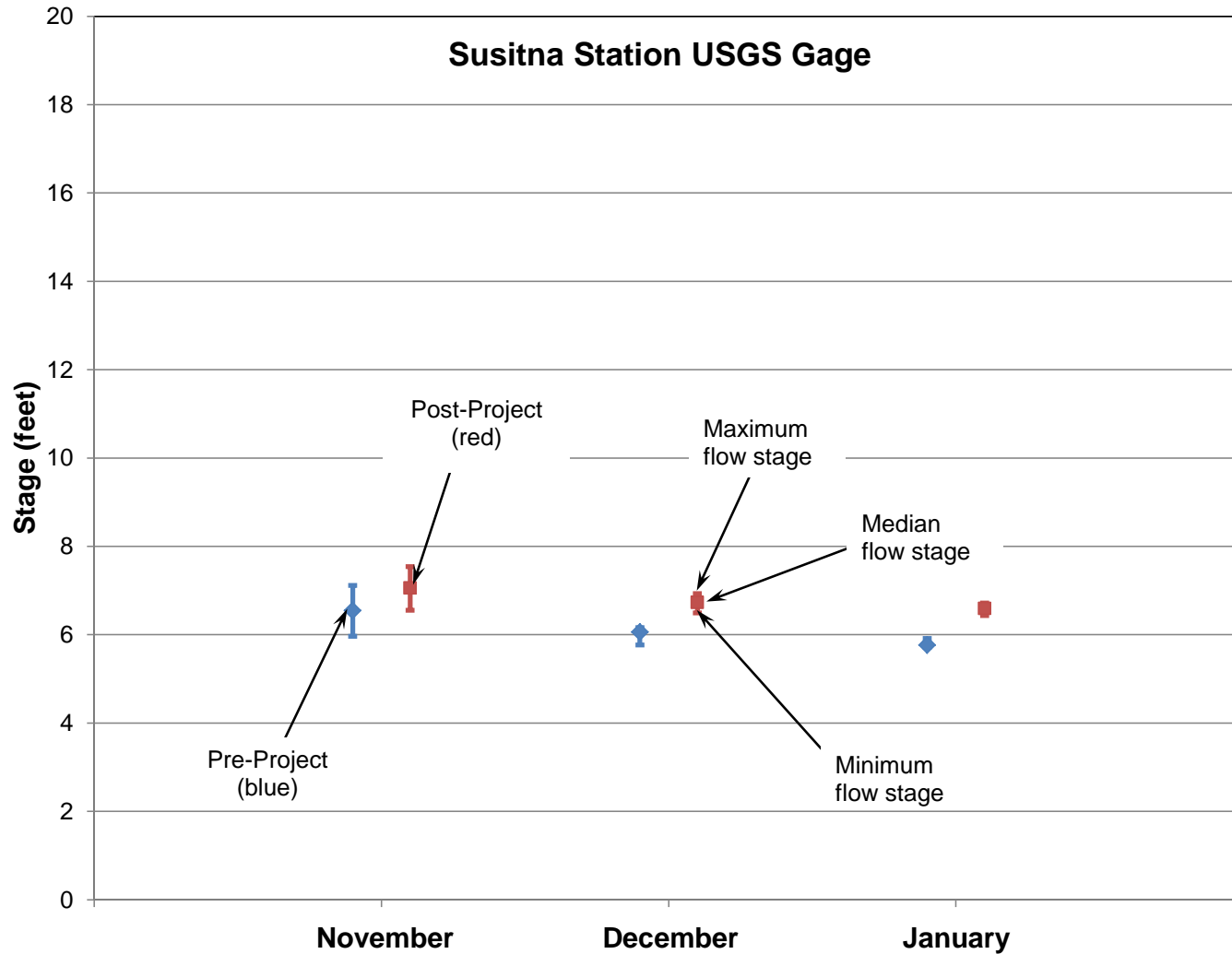
Sunshine – Winter Stages



Susitna Station – Summer Stages



Susitna Station – Winter Stages

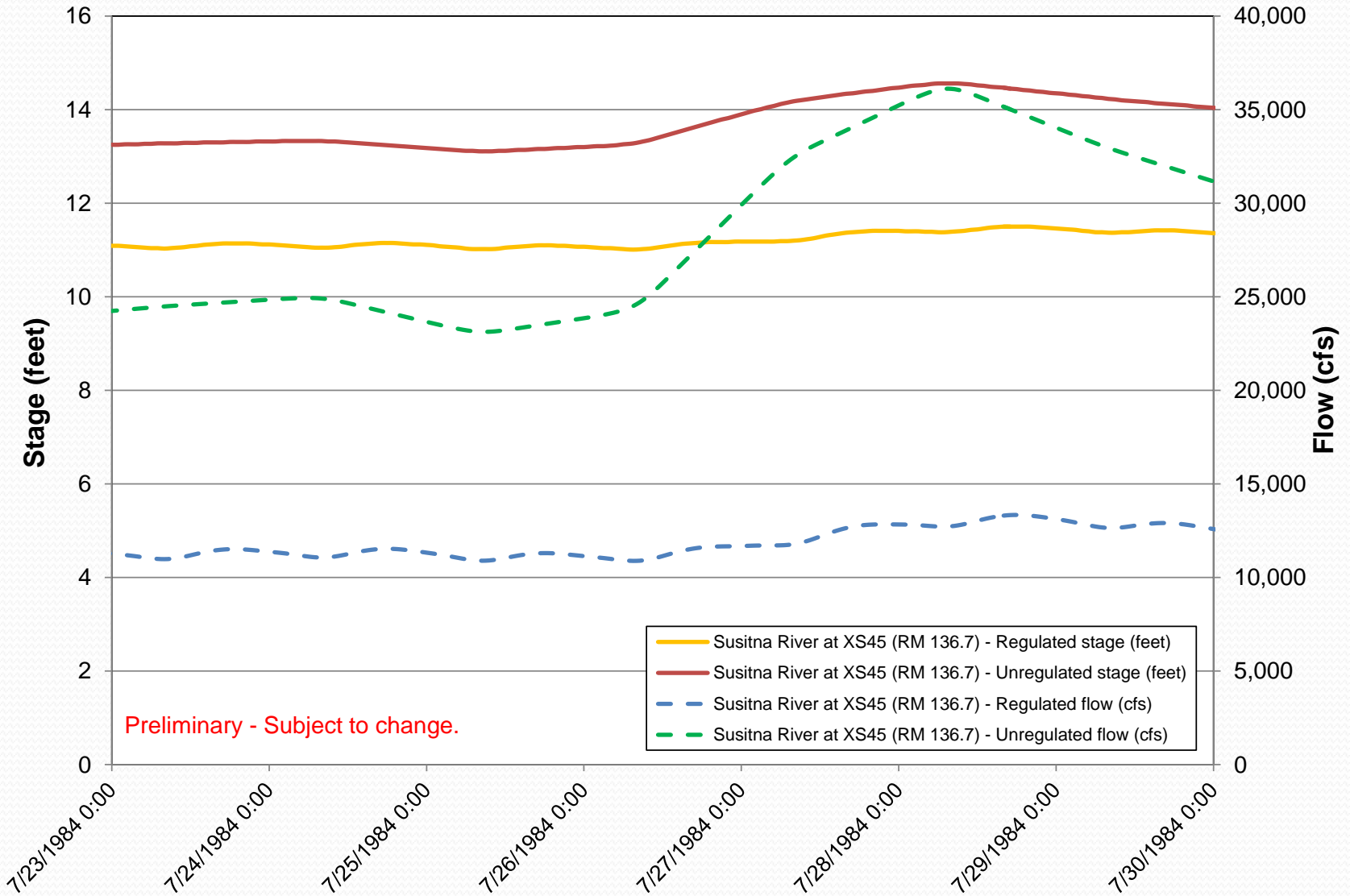


Downstream Stages with Hourly Flow Routing

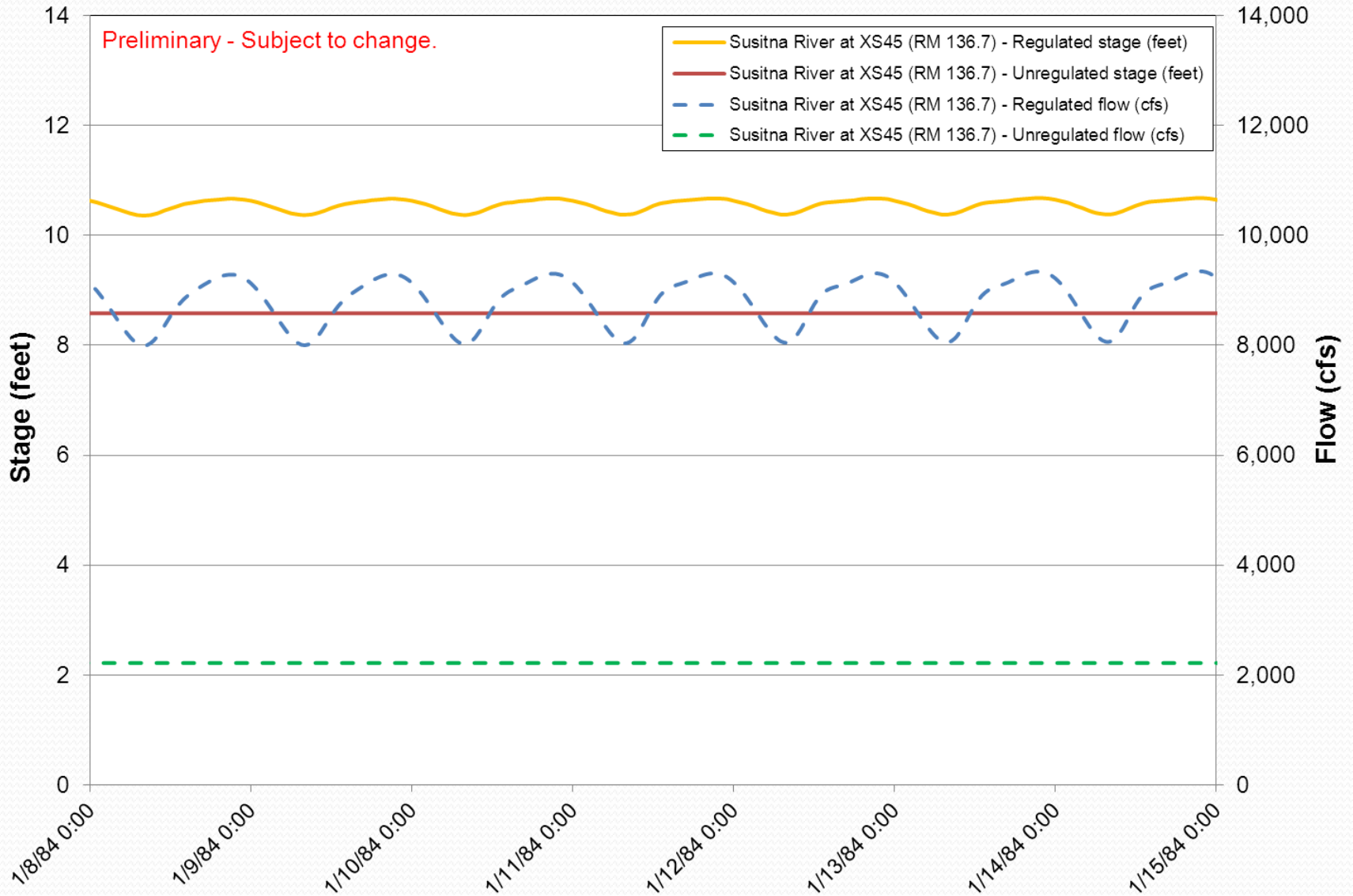
Basis and Assumptions

- Based on daily historic recorded flows for January 1984 and July 1984
- Routing model developed based on cross-section data from 1980s hydrographic surveys and rating curves from 1980s HEC-2 modeling
- Hourly Watana required generation data provided by Slater Consulting from PROMOD preliminary results - 1 day in January and 1 day in July
- All days of the week were assumed to follow the same demand pattern as was provided
- Flow routing results from HEC-ResSim
- Stage datum varies from X-section to X-section

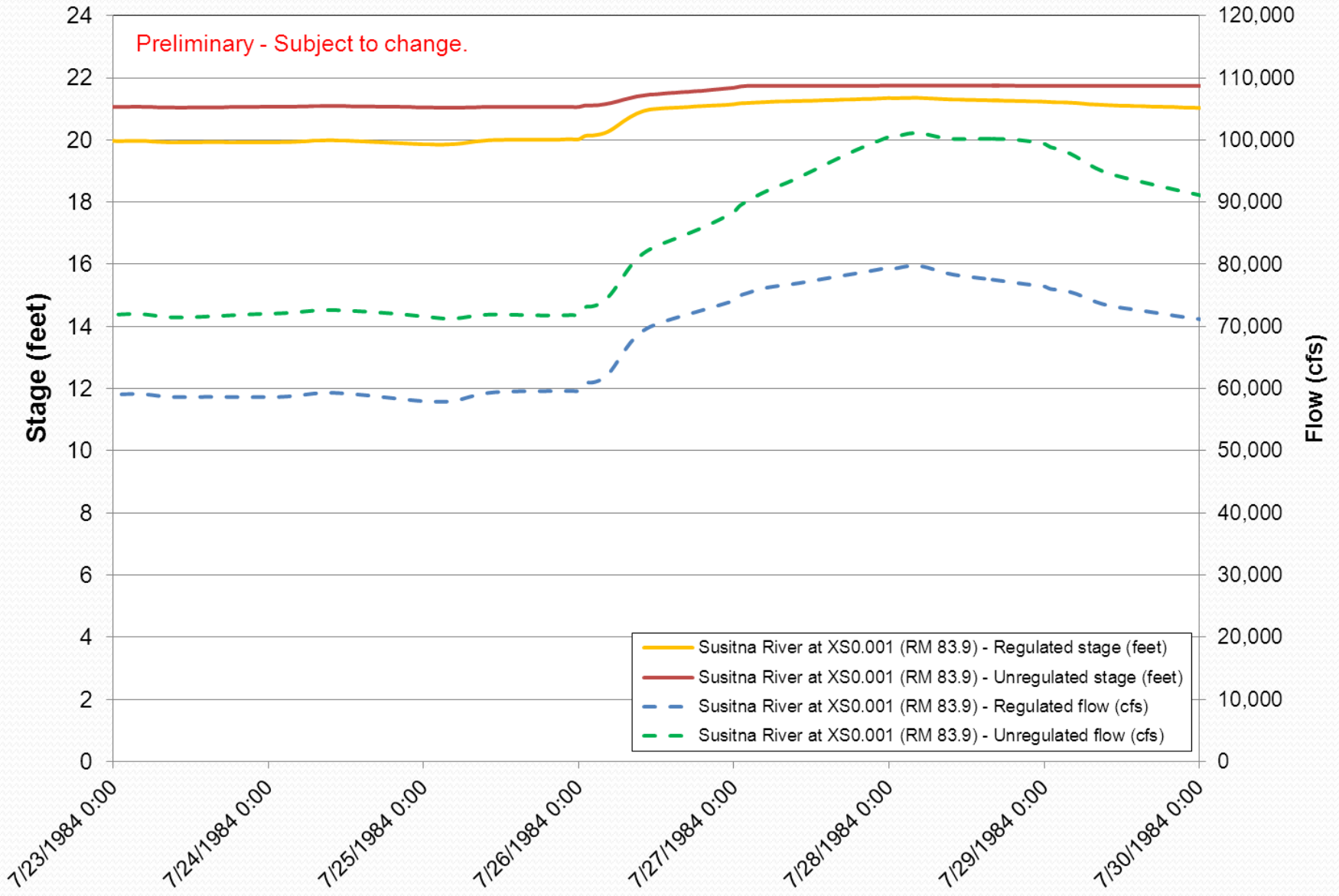
Stage and Flow near Gold Creek - July



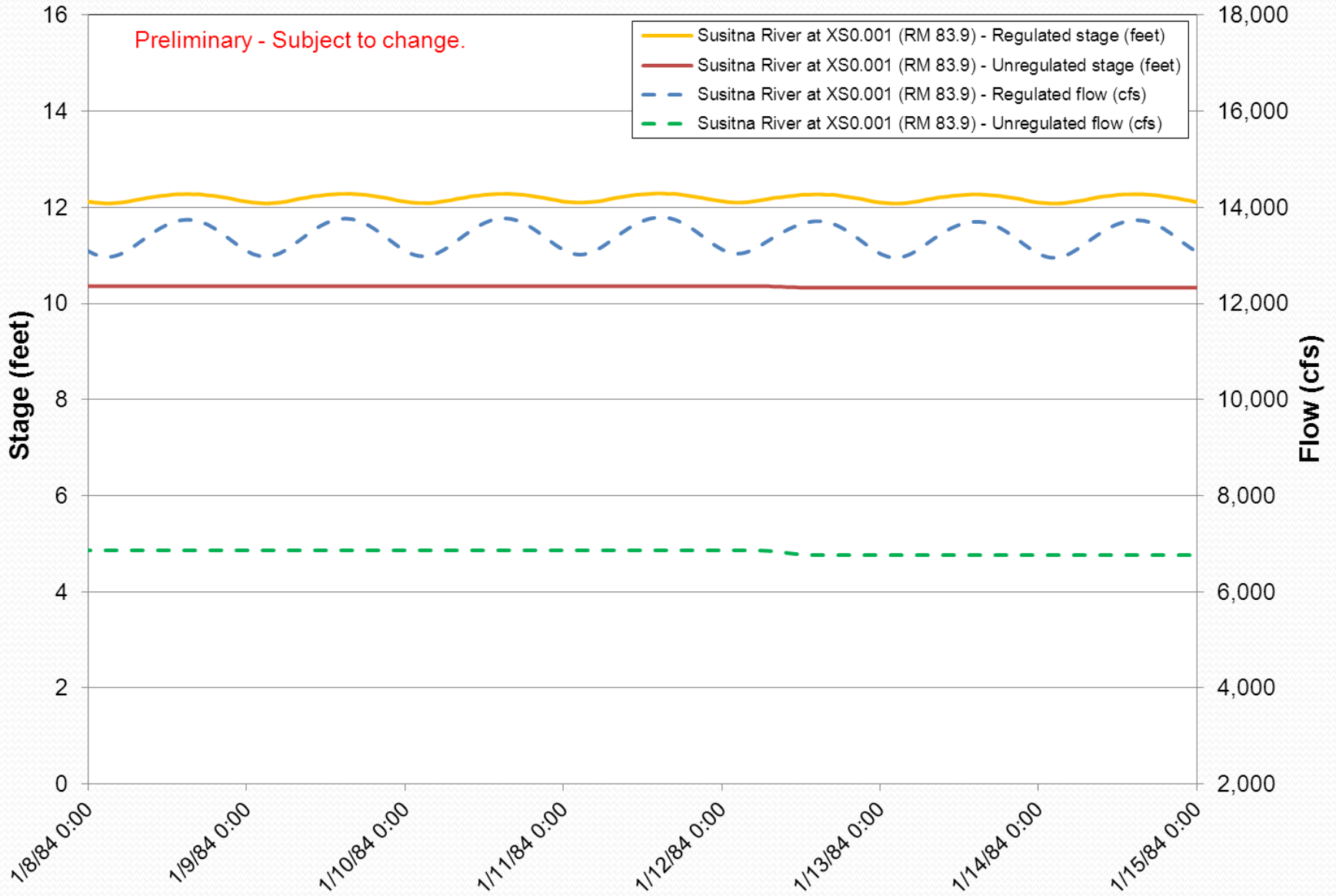
Stage and Flow near Gold Creek - January



Stage and Flow near Sunshine - July



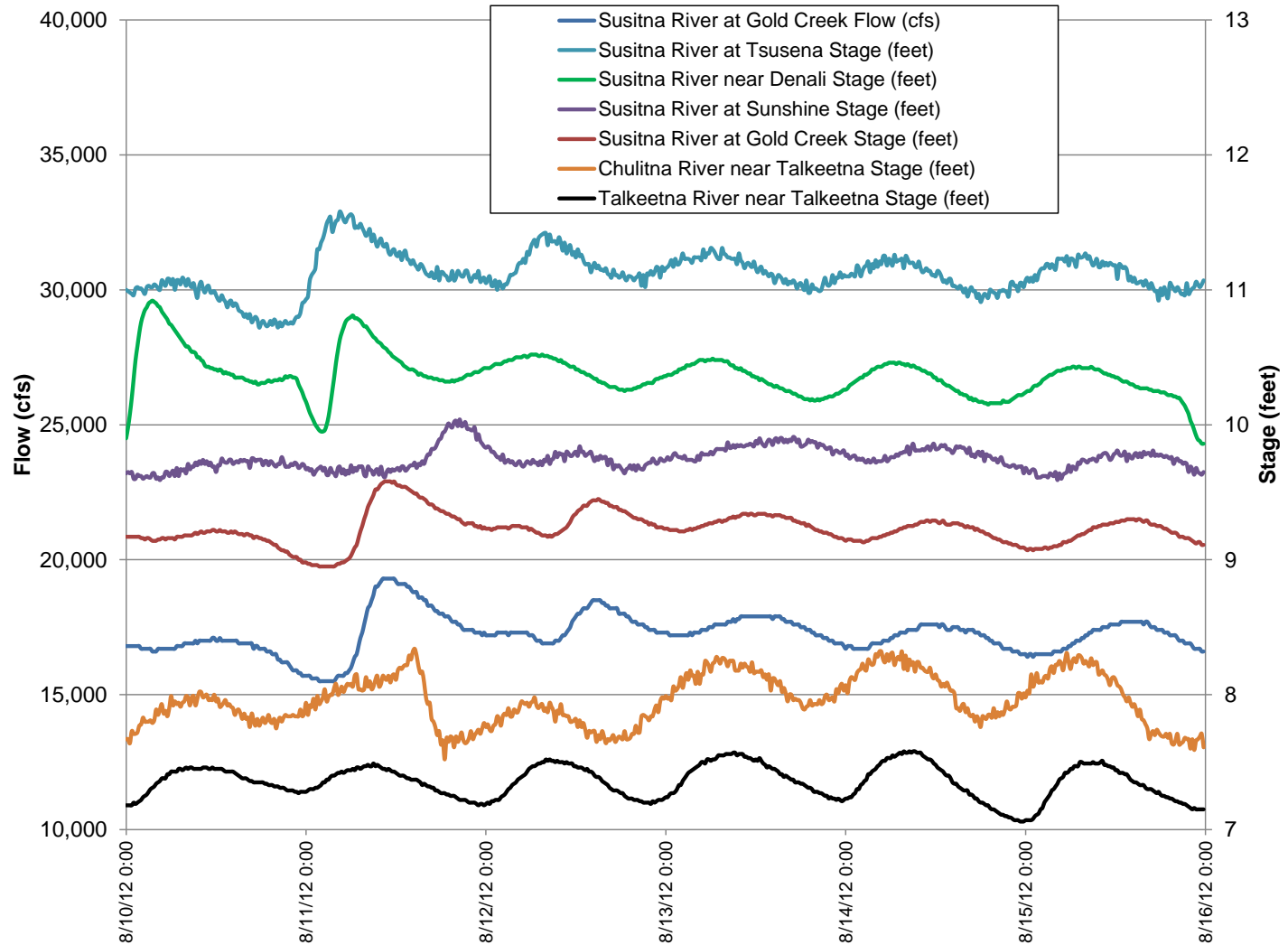
Stage and Flow near Sunshine - January



Recorded August 2012 Flow and Stages

- Based on 15-minute recorded data at USGS gages from August of this year
- To facilitate the display of stages at many gages on a single plot, a constant value has been added to the datum of some of the gages to create the plot array
- Flow available only at Gold Creek
- The natural diurnal stage variations that appear to be similar to future load following are undoubtedly the result of the daily pattern of snow and glacial ice melting

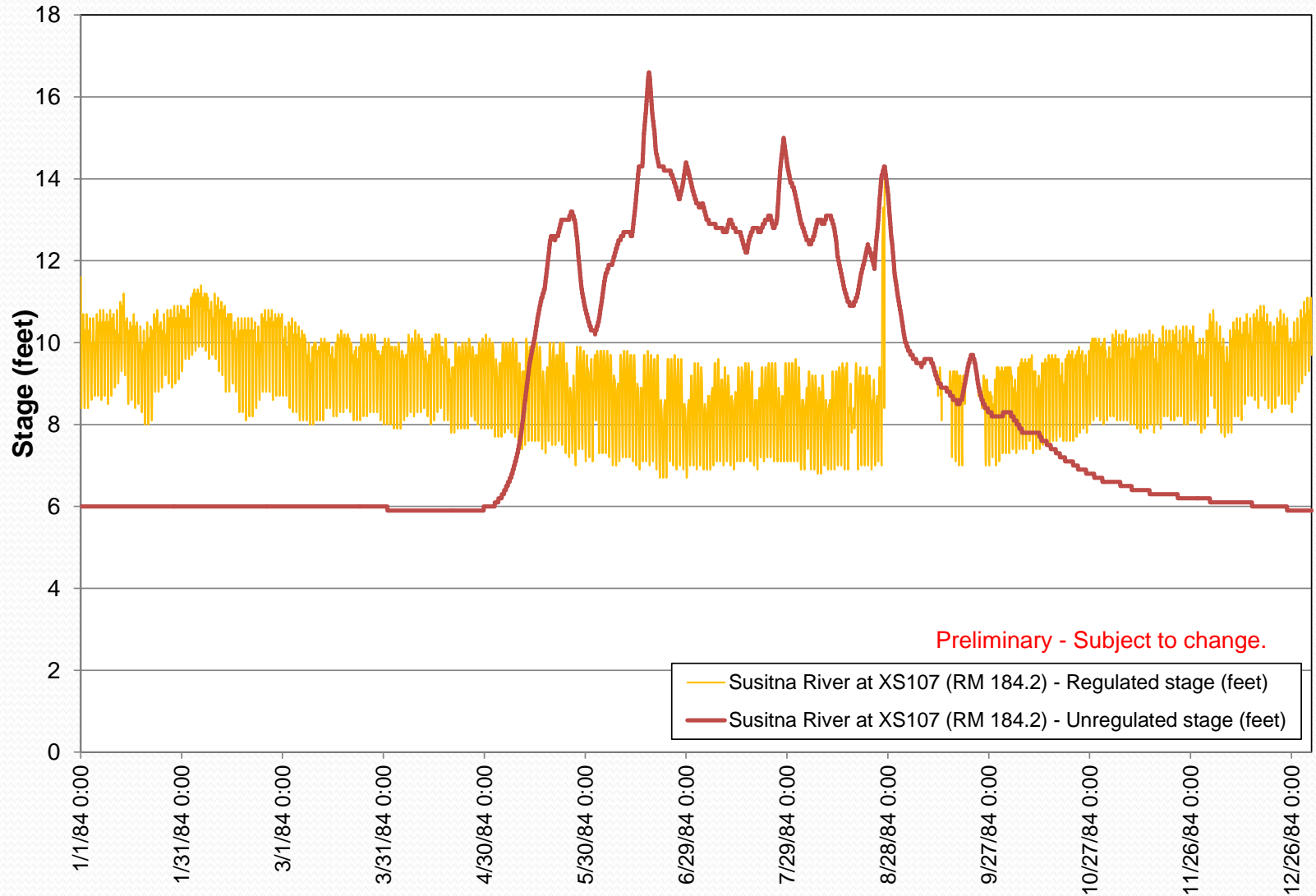
Recorded August 2012 Flow and Stages



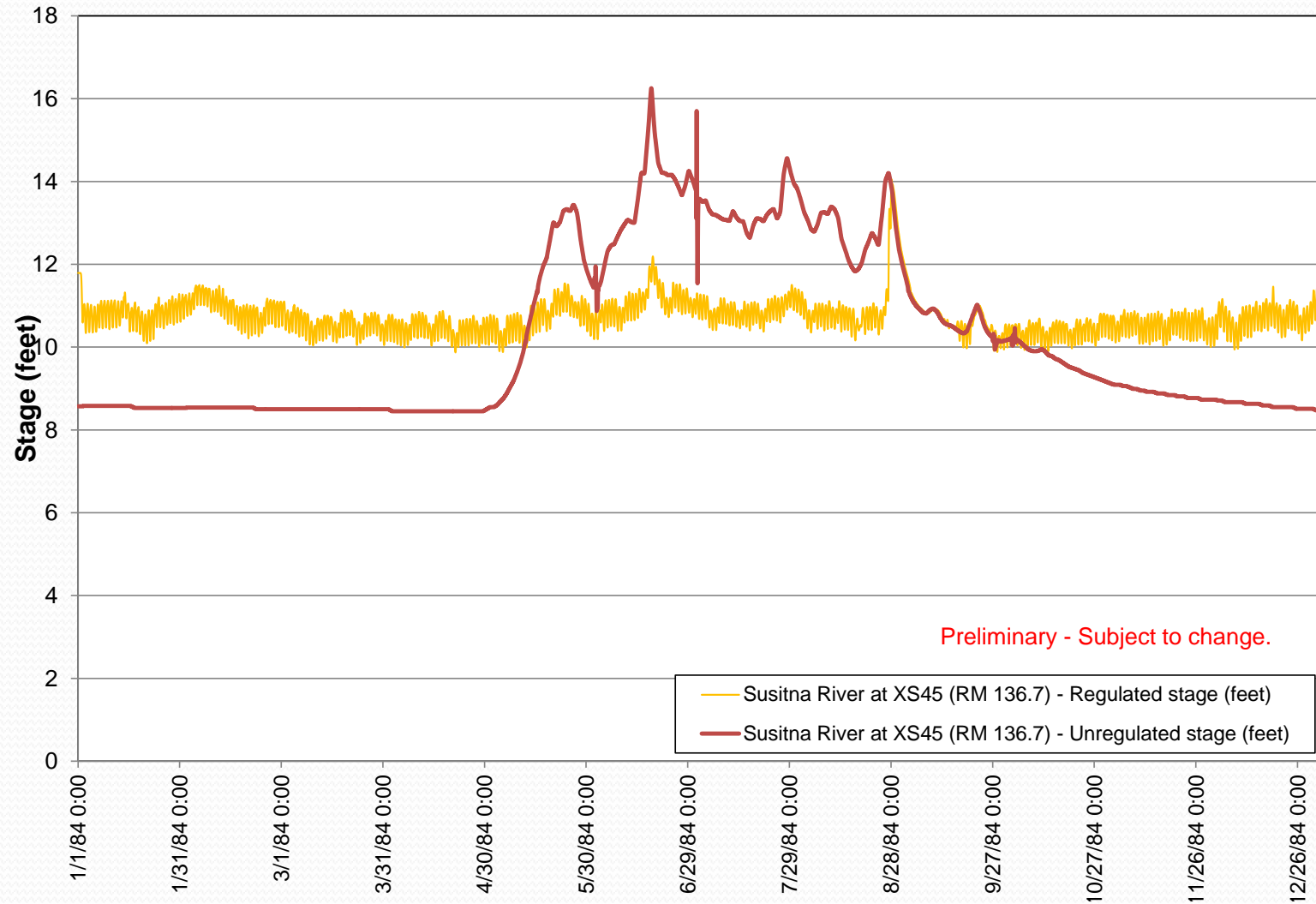
Alternative Load – Downstream Stages Basis and Assumptions

- Based on recorded unregulated flows for 1984
- Generation requirement assigned to Watana is assumed to include the entire load fluctuation of the entire Railbelt
- Prepared for illustration purposes – Watana load is very conservative for any period of time and not realistic for an entire year
- Hourly flow routing results from HEC-ResSim
- Uses 1980s cross-sections and HEC-2 rating curves
- Railbelt generation loads from the 2010 Railbelt Integrated Resources Plan

Stage Near Watana Tailwater - 1984



Stage Near Gold Creek - 1984



Stage Near Sunshine - 1984

