Wind Challenges

Presented to the
National Hydro Association Annual Conference

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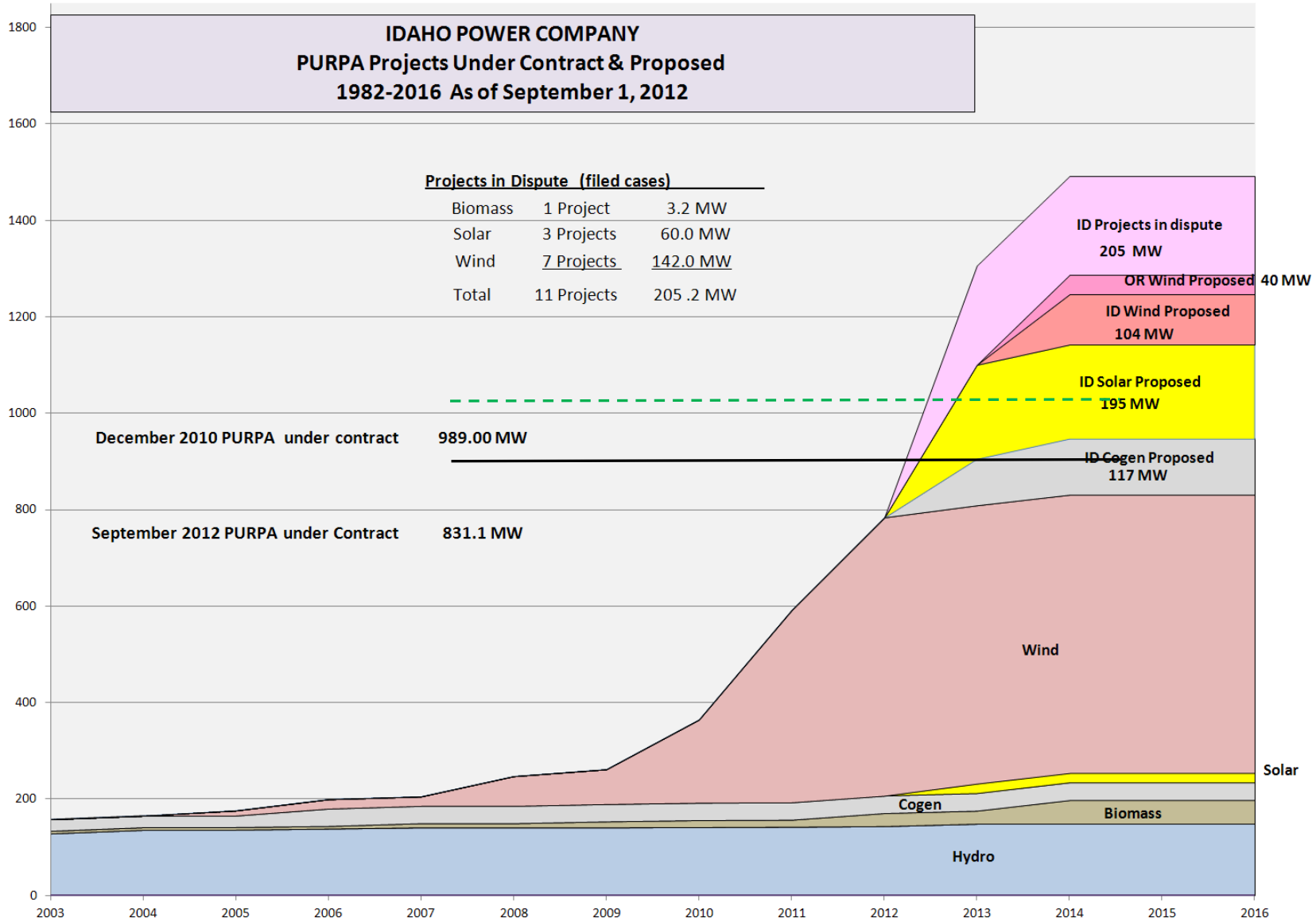
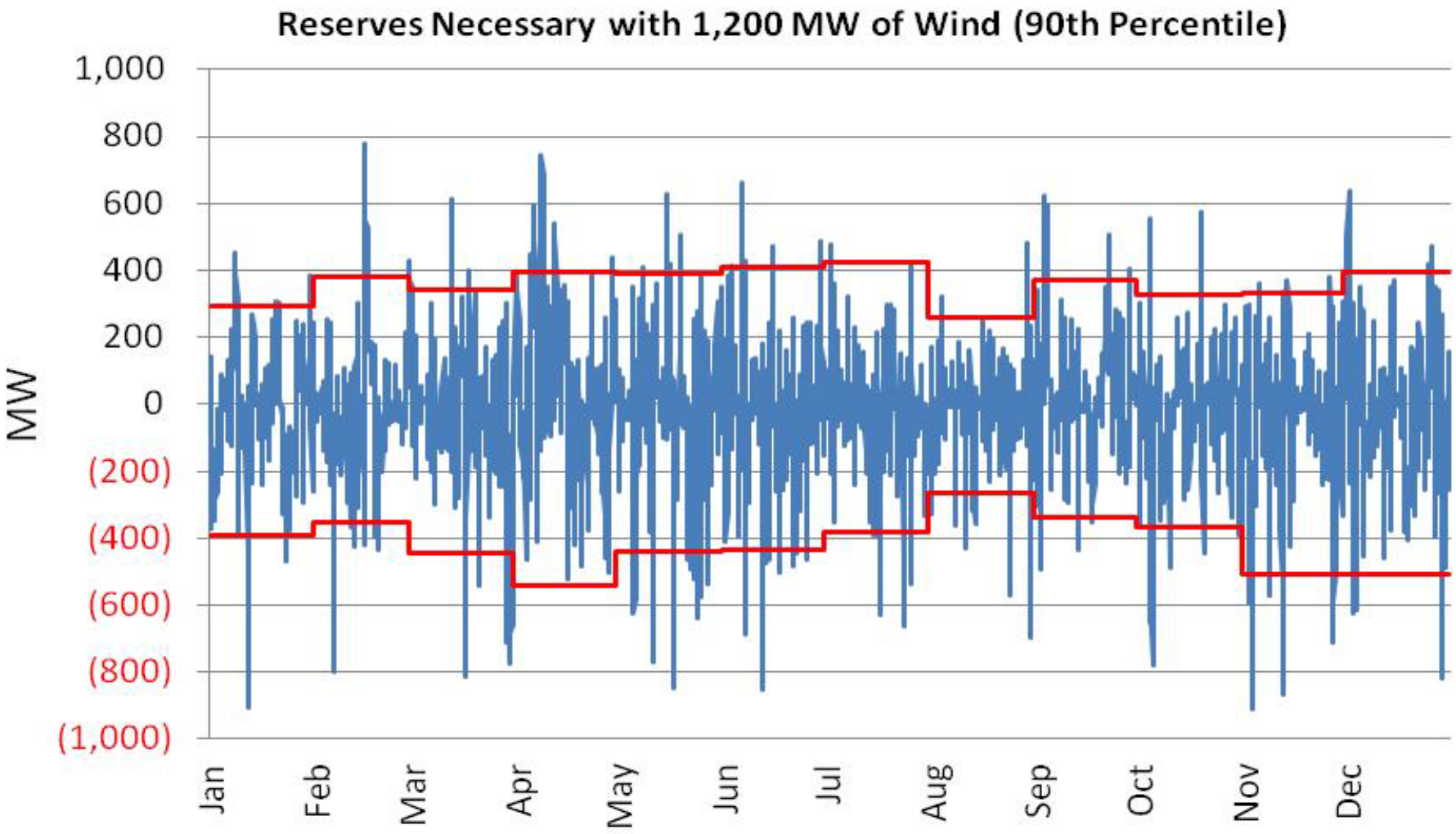
April 23, 2013

IDAHO POWER
An IDACORP Company

PURPA Status As of Sept 2012

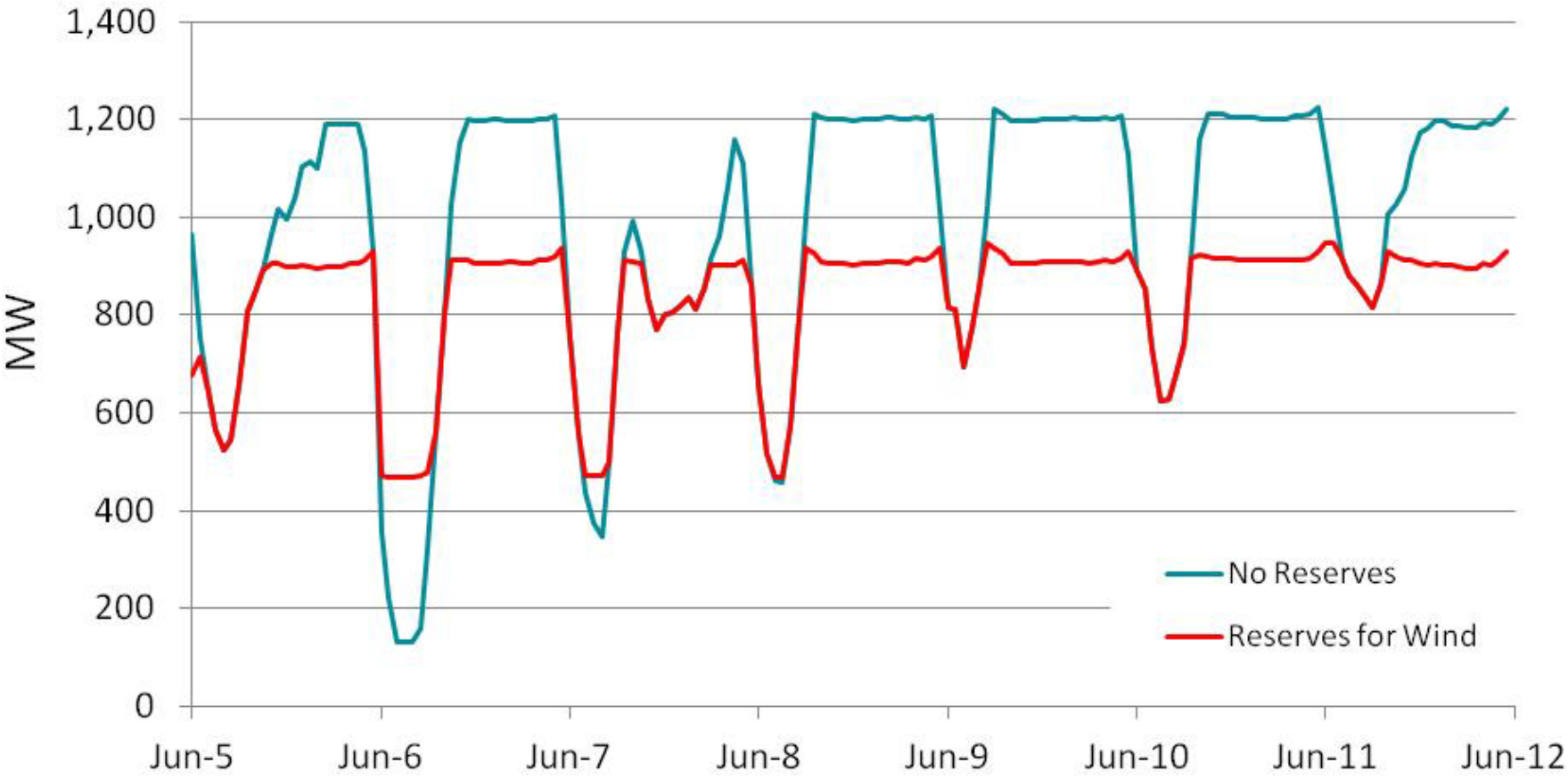


Wind Variability



Hydro Operations

Hells Canyon Complex



General Findings

- As wind penetration increases:
  - Hydro generation decreases
  - Spill and DG increases
  - Coal generation decreases
  - Gas generation increases (to provide reserves)
  - Net sales increase (due to surplus energy, during low/negative market)
  - Frequency and duration of curtailment increases

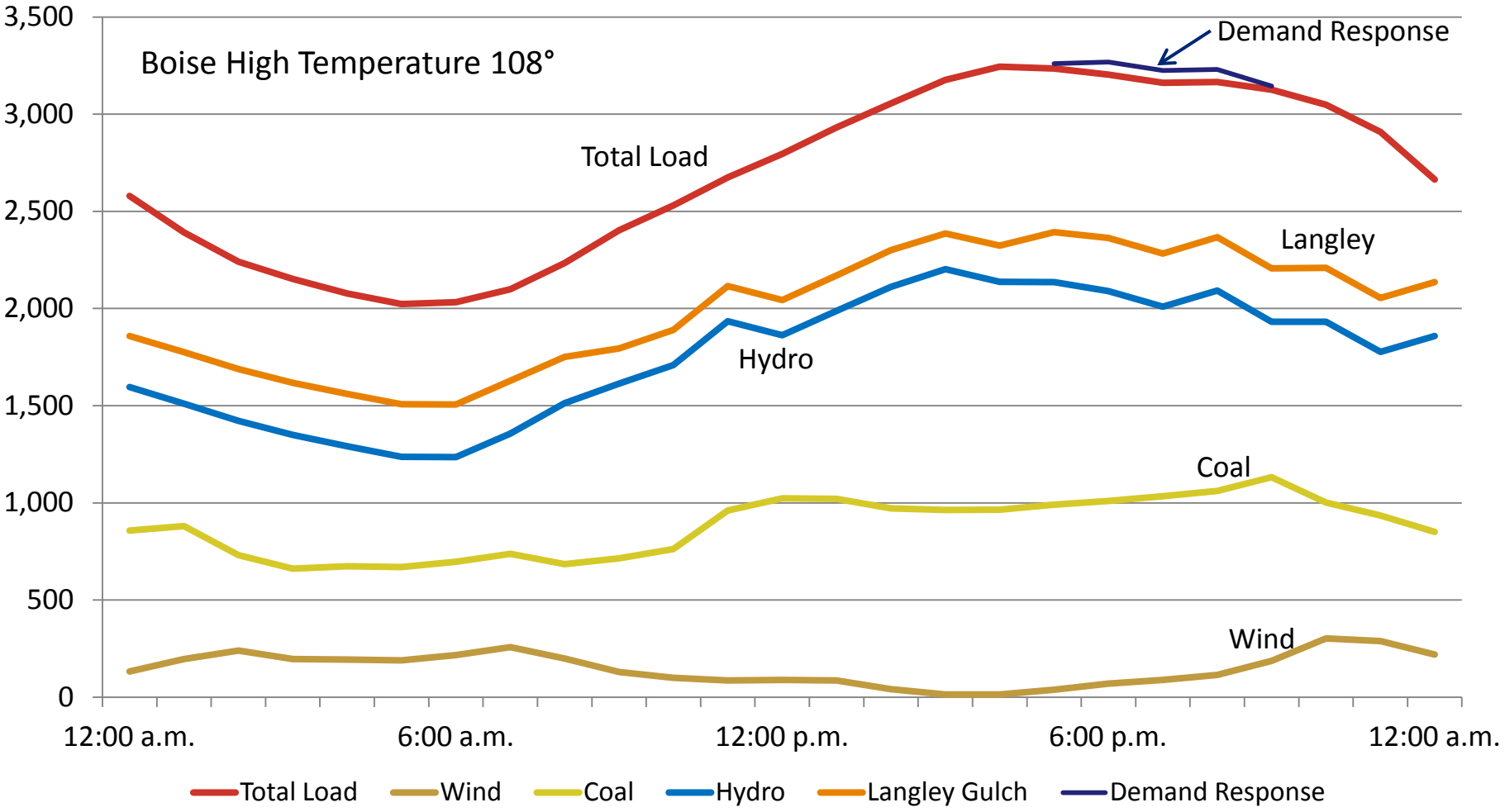
General Findings

- Problems during low load periods (1,000 to 1,100 MW) because all IPC resources are backed down to minimums
- More wind can be integrated when load is higher
- Integration cost and curtailment begin to increase rapidly at a penetration level of around 800 MW

Summer Peak

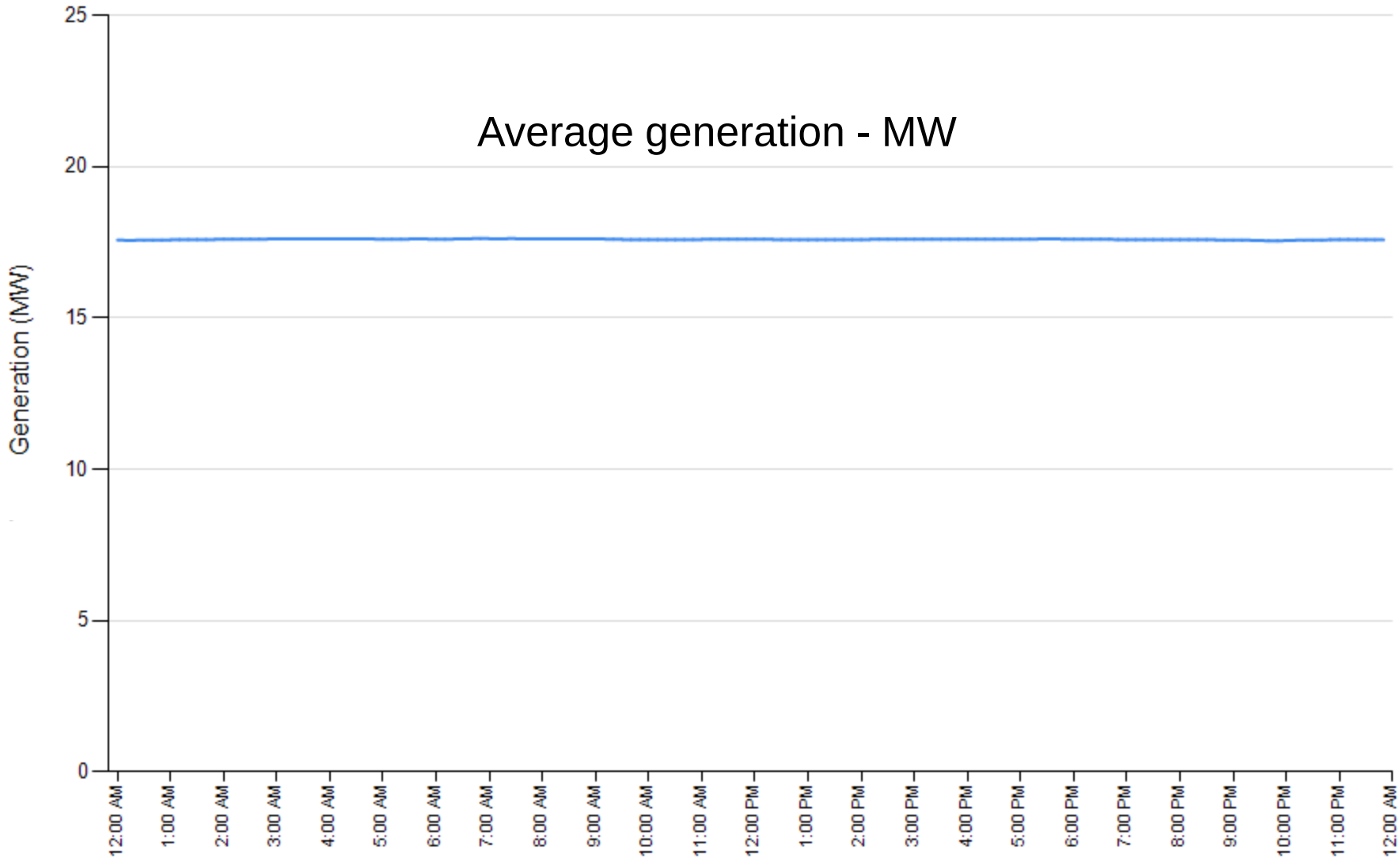
Load and Resources

3,245 MW - July 12, 2012



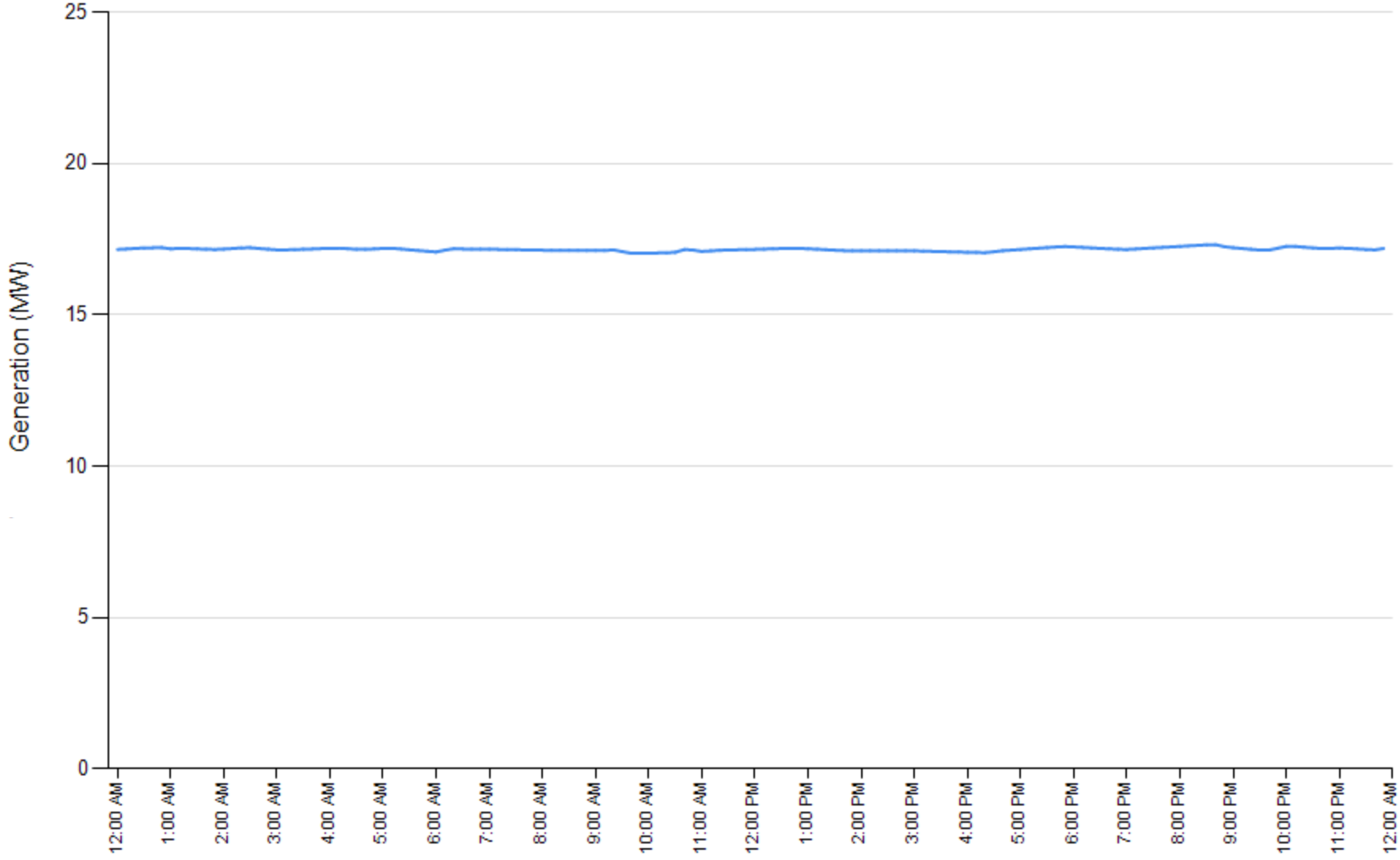
February 2012

Upper Salmon B



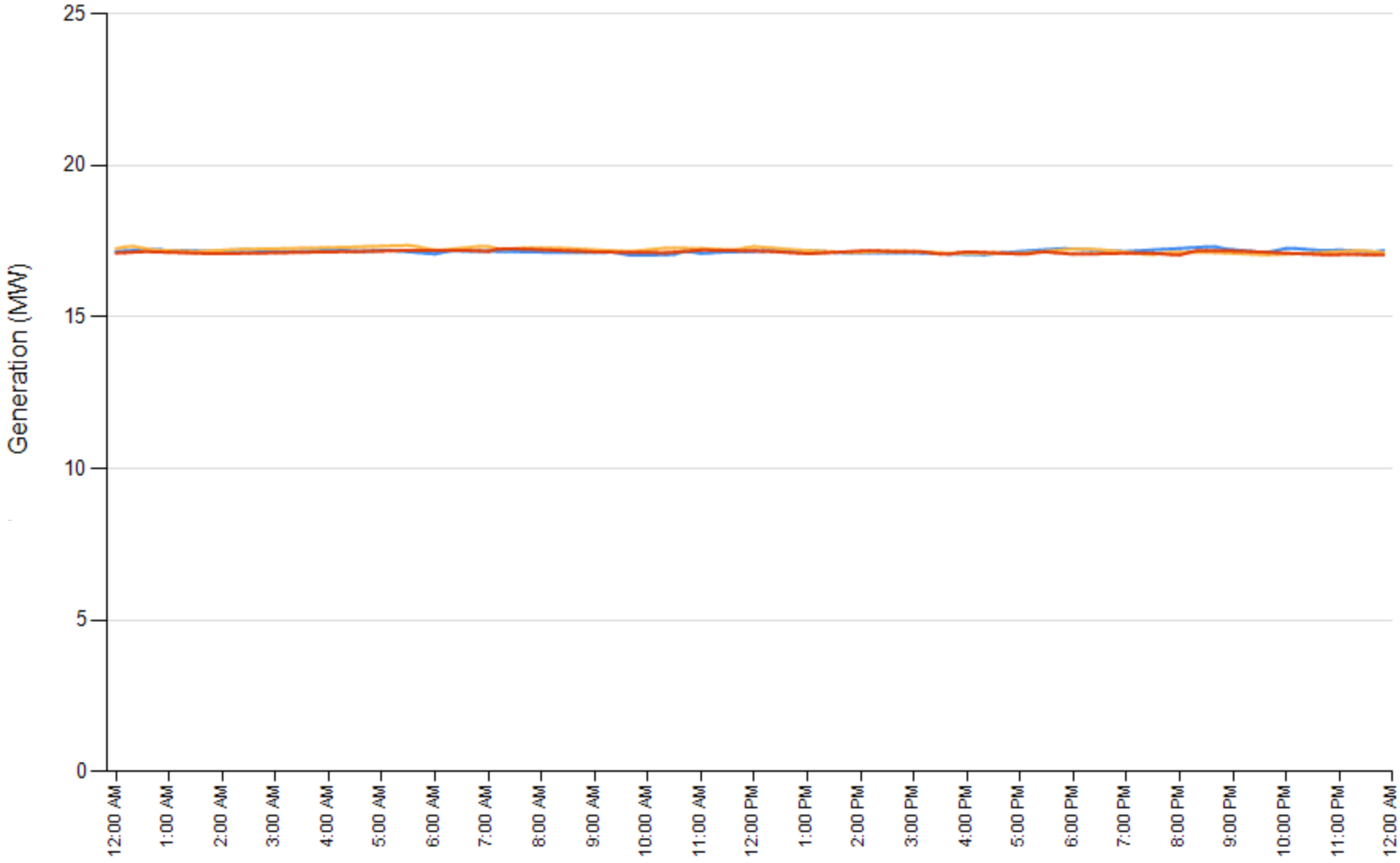
February 2012 – 1 day

Upper Salmon B



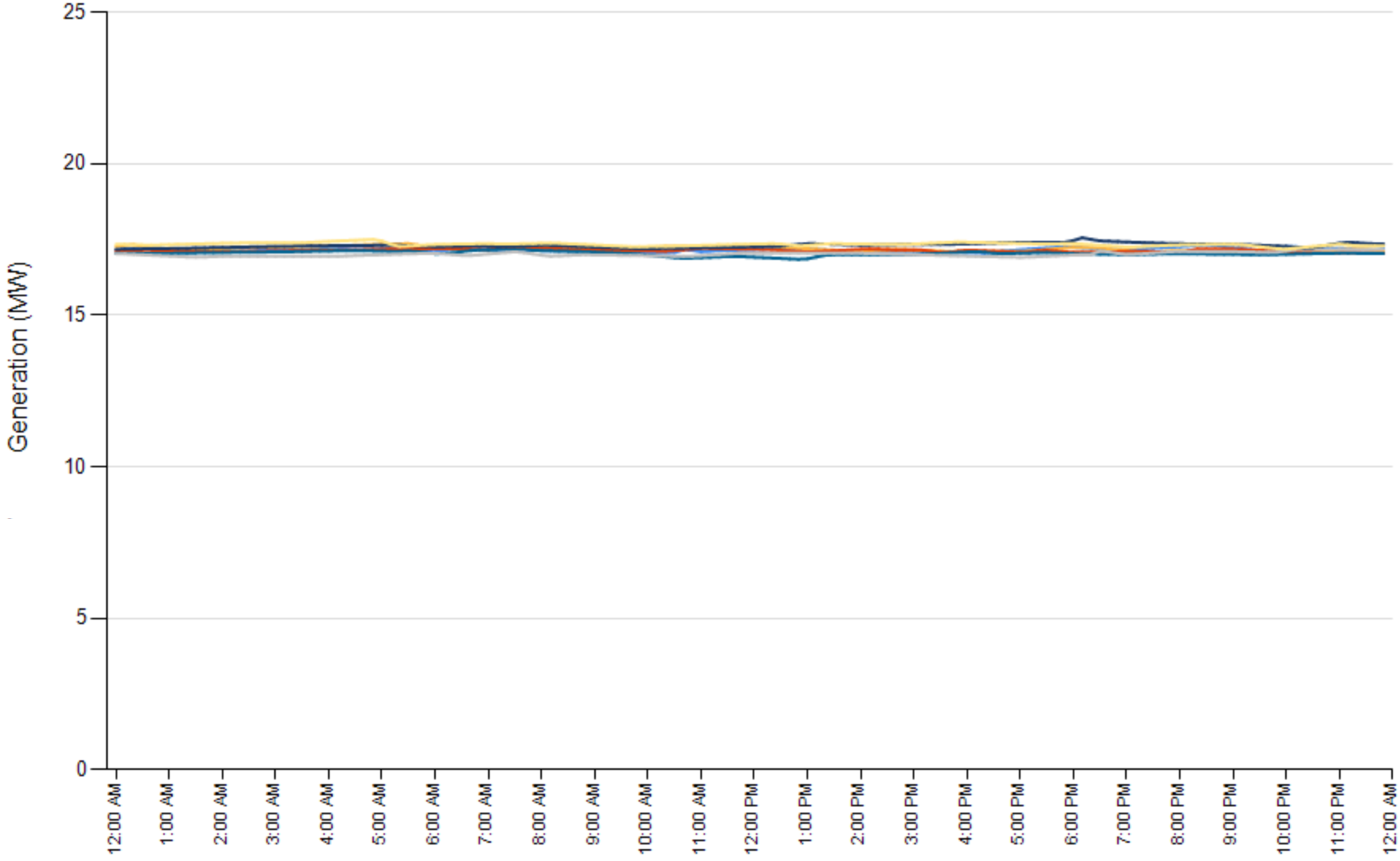
February 2012 – 3 days

Upper Salmon B



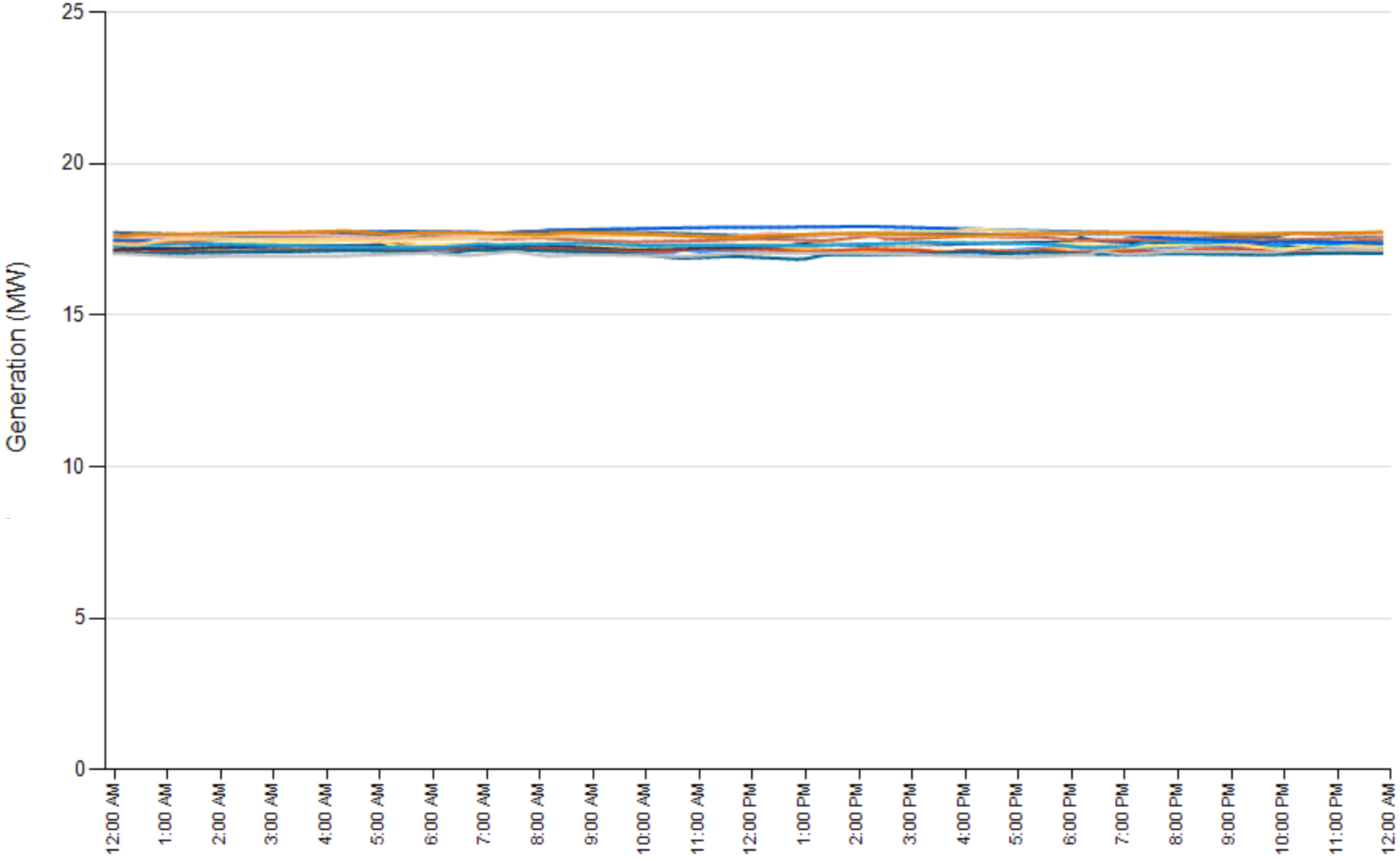
February 2012 – 7 days

Upper Salmon B



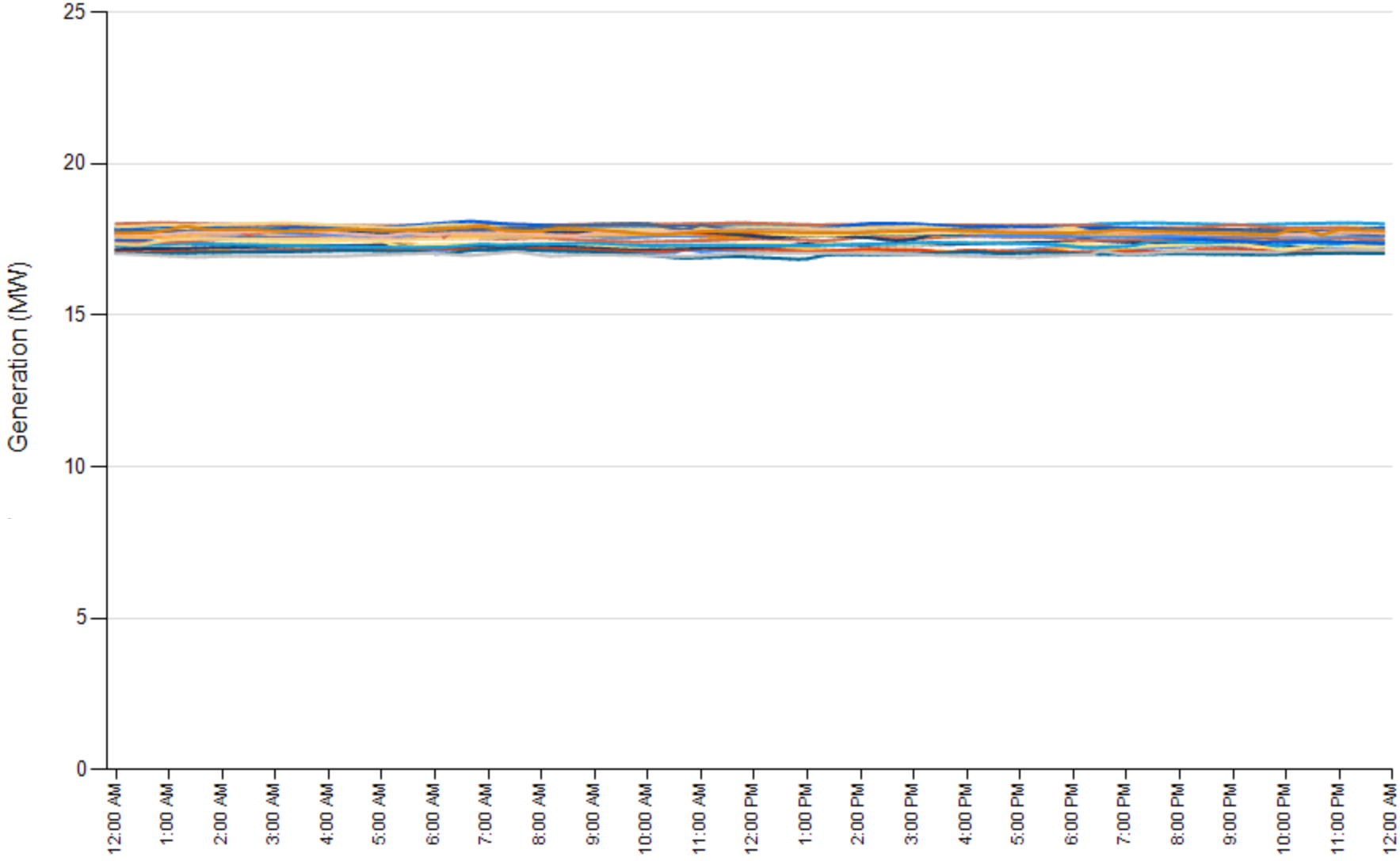
February 2012 – 14 days

Upper Salmon B



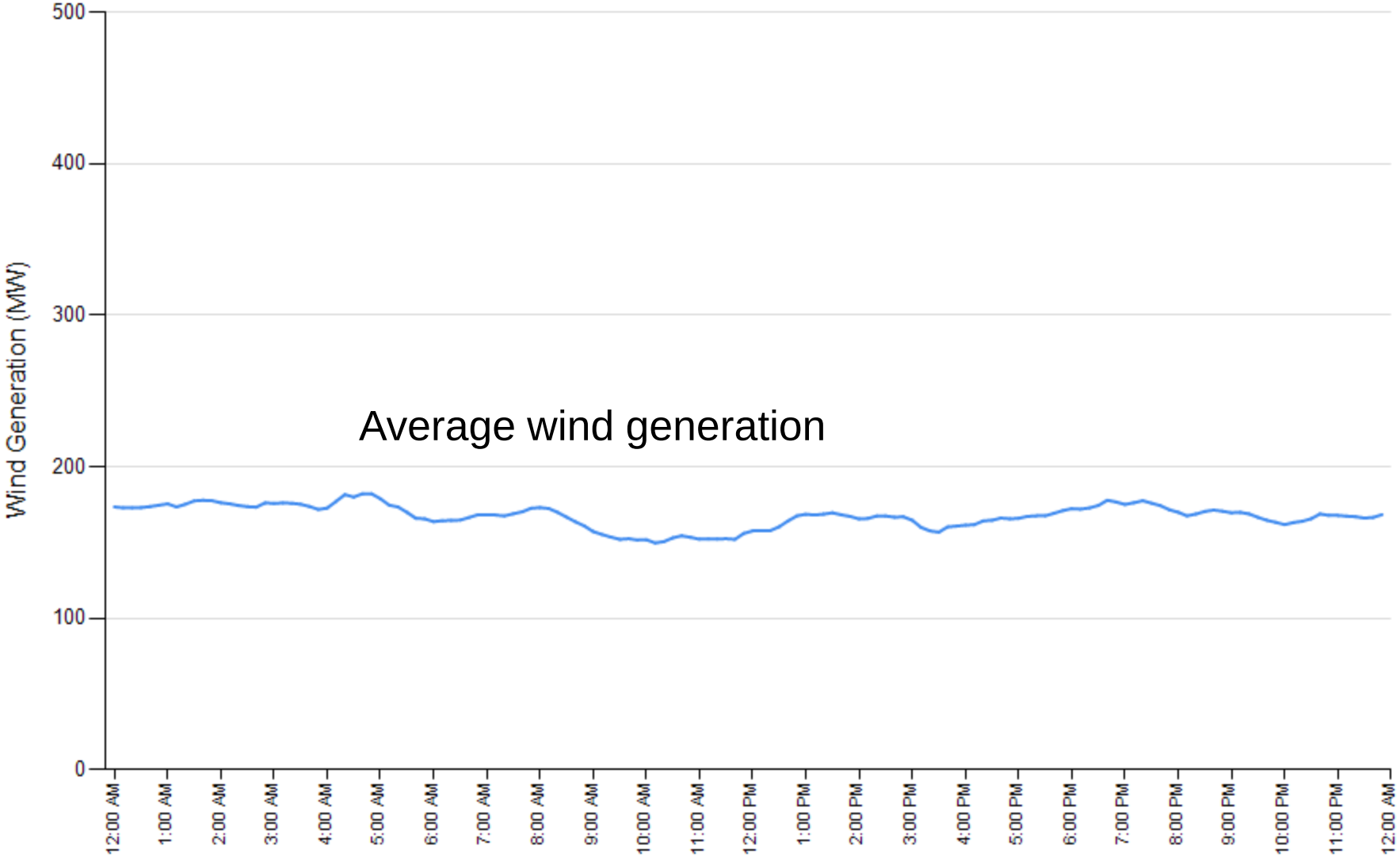
February 2012 – 29 days

Upper Salmon B



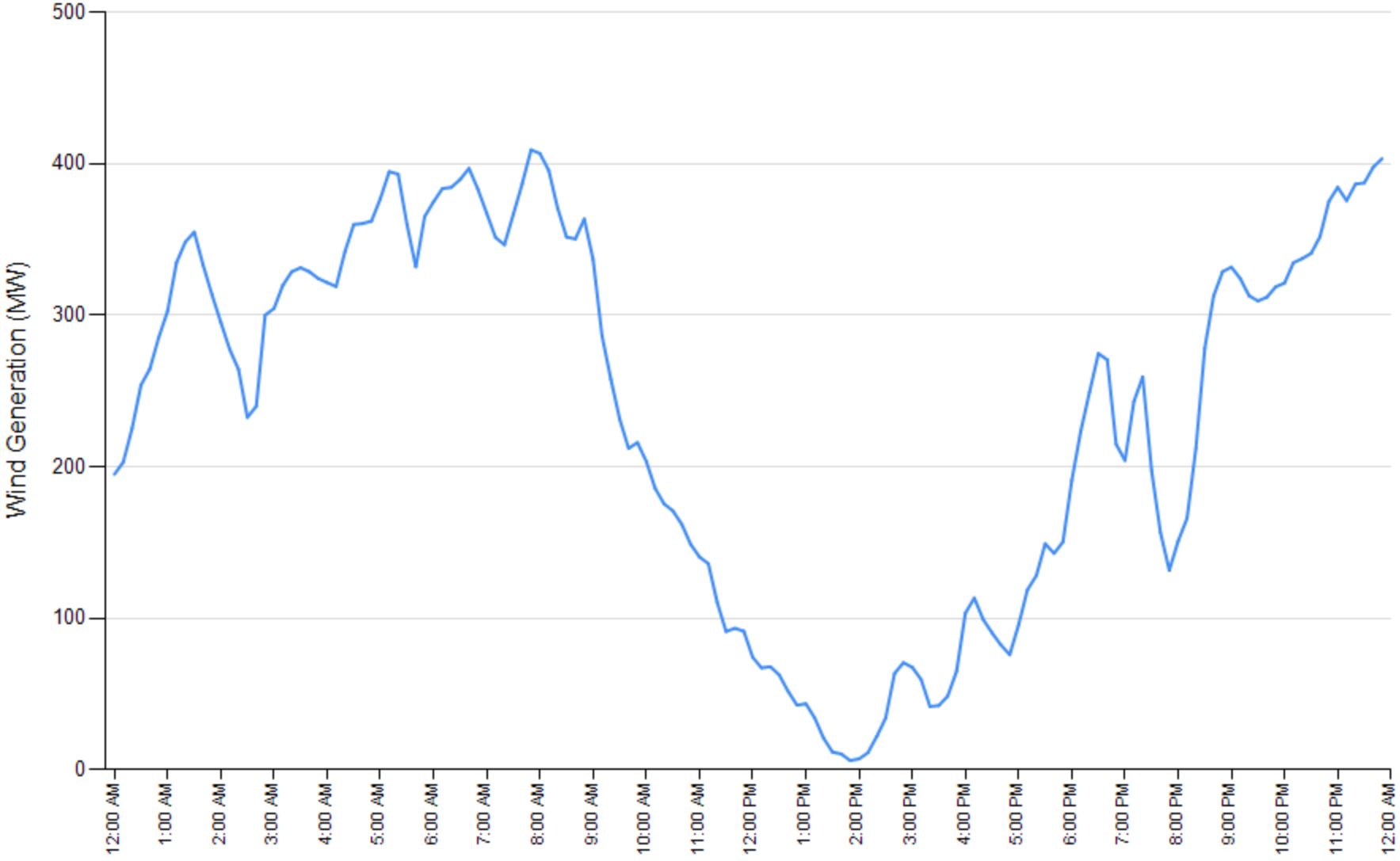
February 2012

Wind Generation



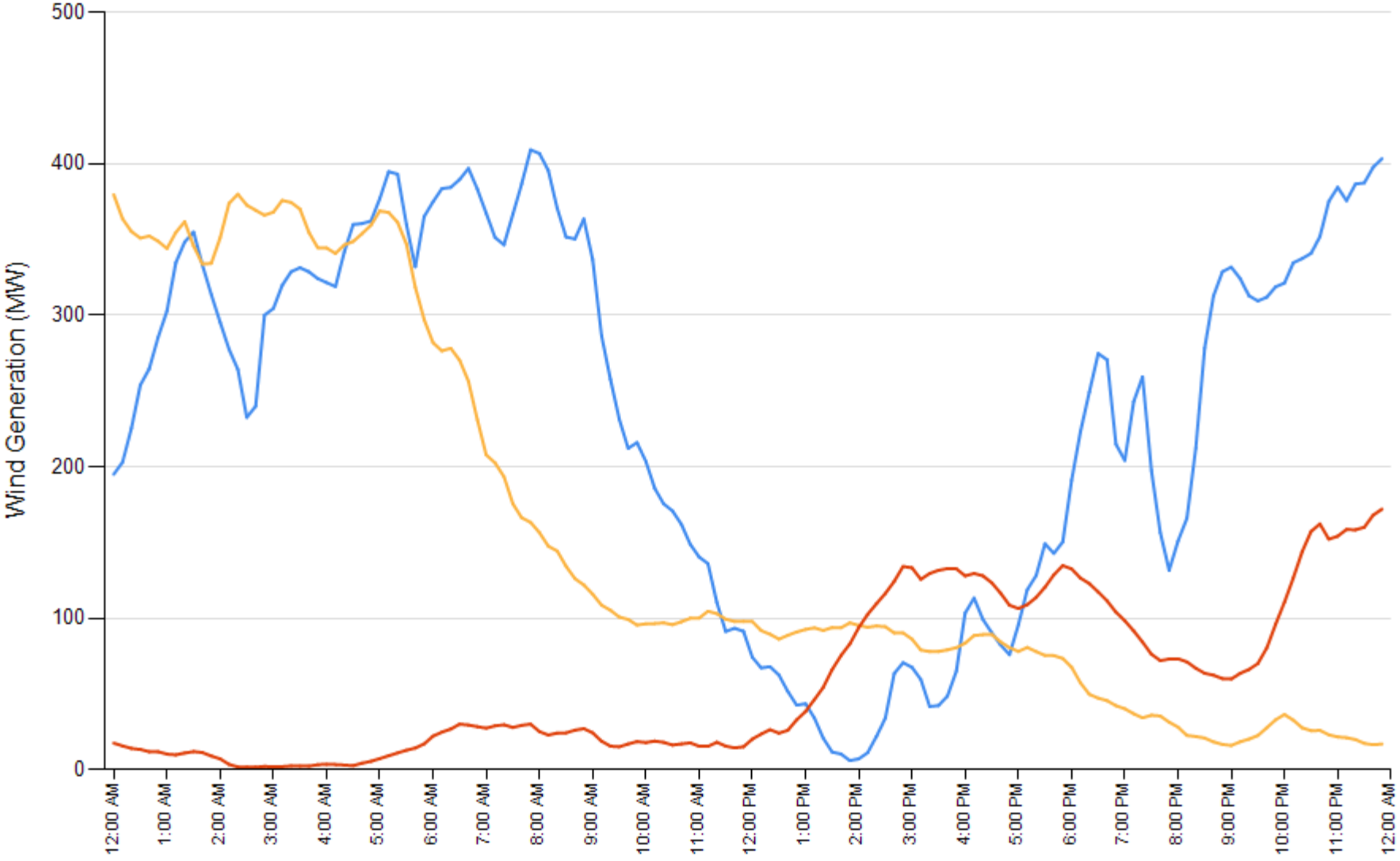
February 2012 – 1 day

Wind Generation



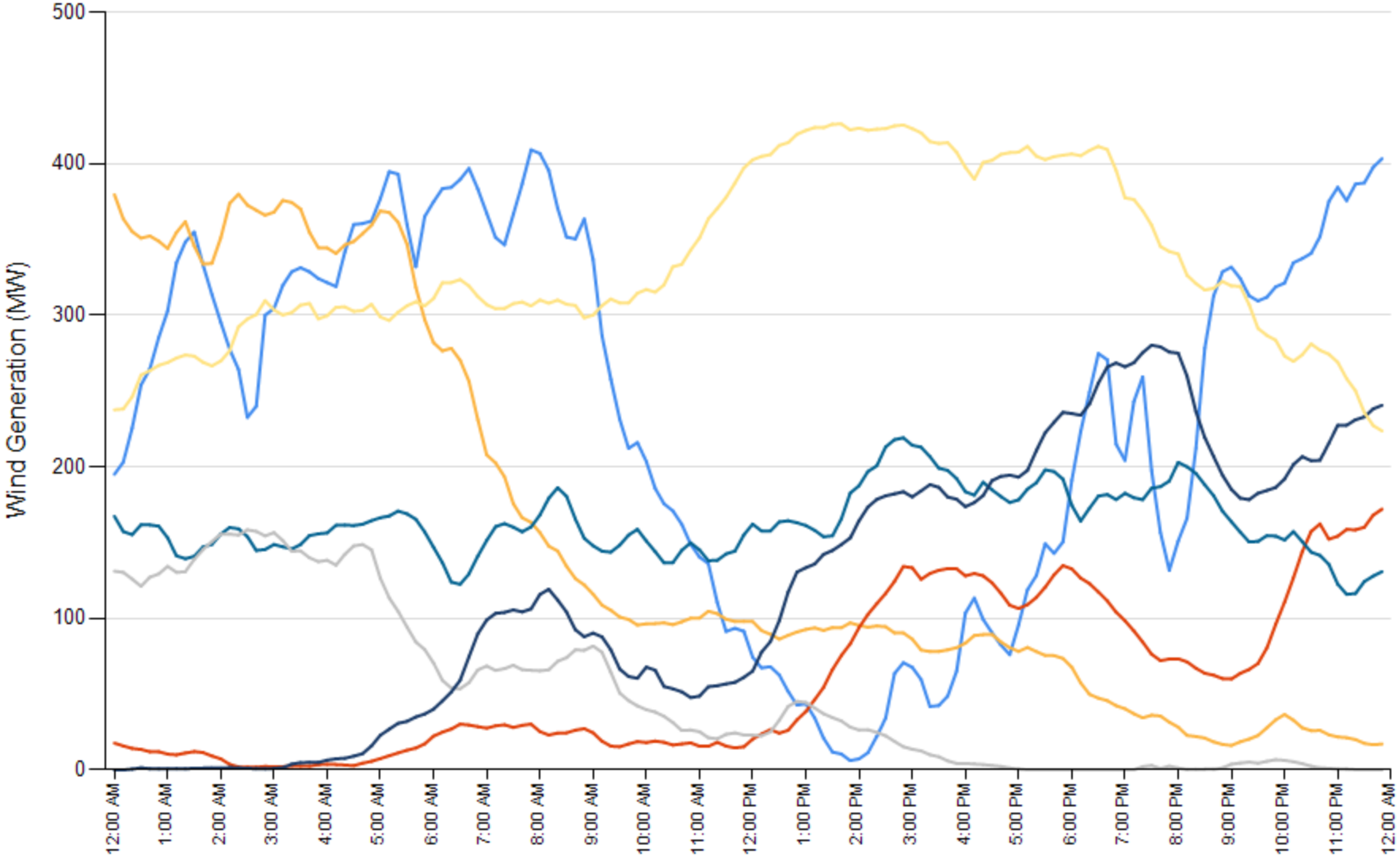
February 2012 – 3 days

Wind Generation



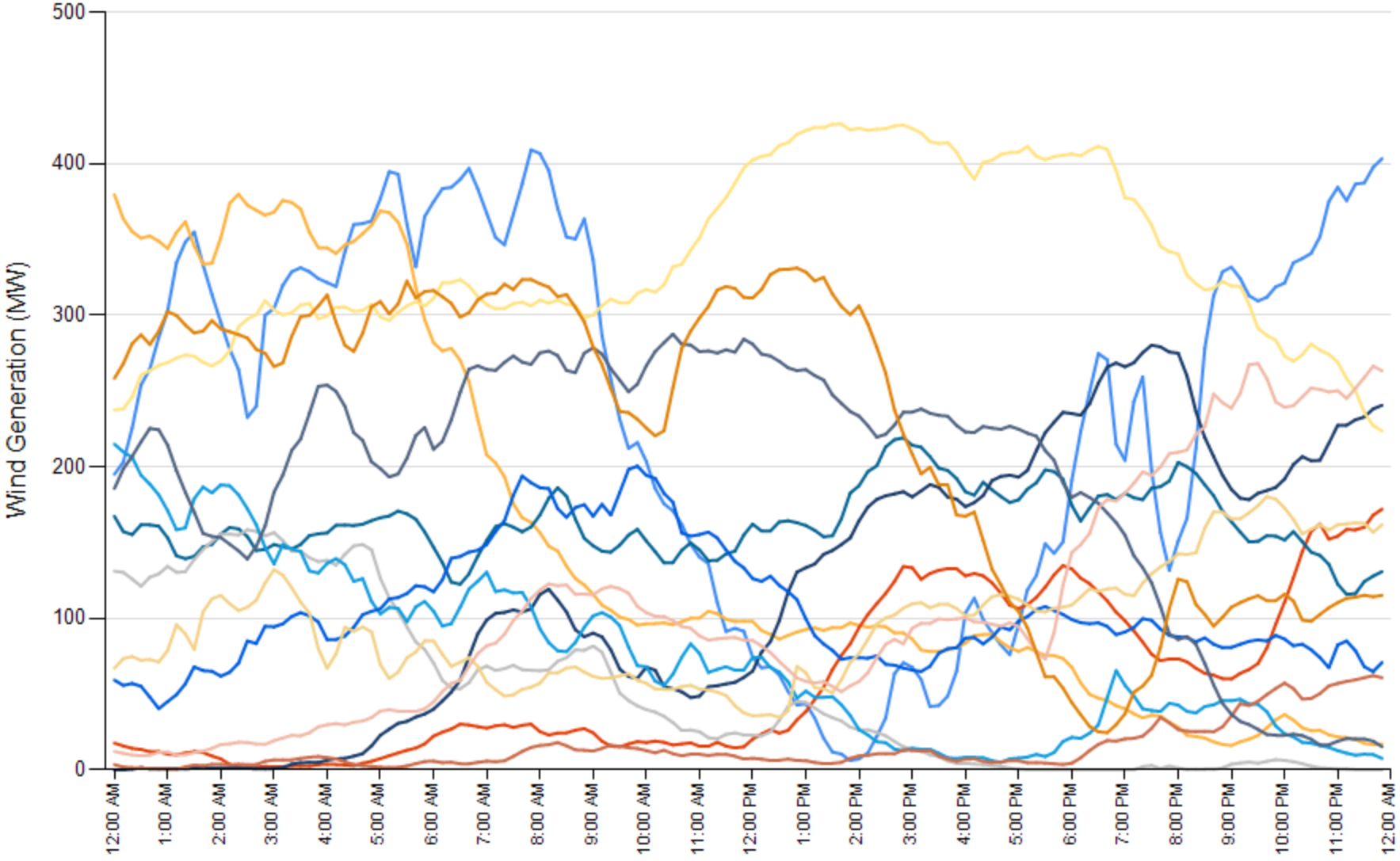
February 2012 – 7 days

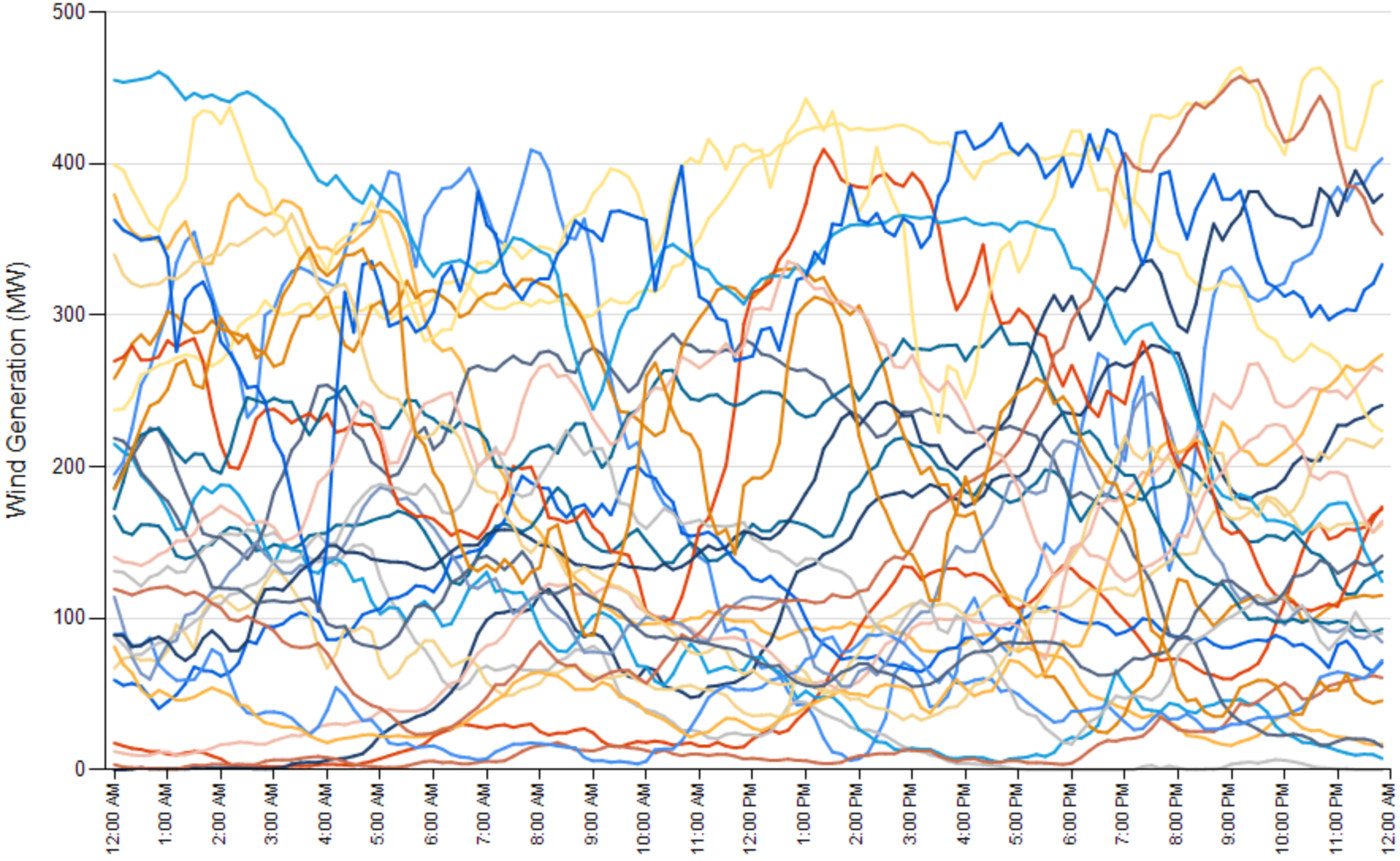
Wind Generation



February 2012 – 14 days

Wind Generation



February 2012 – 29 days

Wind Generation