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A recent summary of water quality and water stargrass biomass on the lower Yakima

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Introduction

- Water Quality on the lower Yakima
  - Historically low nutrients and sediment plus natural flow regime
  - Regulated flow and agriculture led to increased nutrients and sediment, and no flushing flows
  - Suspended sediment TMDL, water clears, still high nutrients and altered flow regime
  - Large increase in macrophyte growth
    - Larger daily oxygen swings
    - pH swings
    - changes water temperatures

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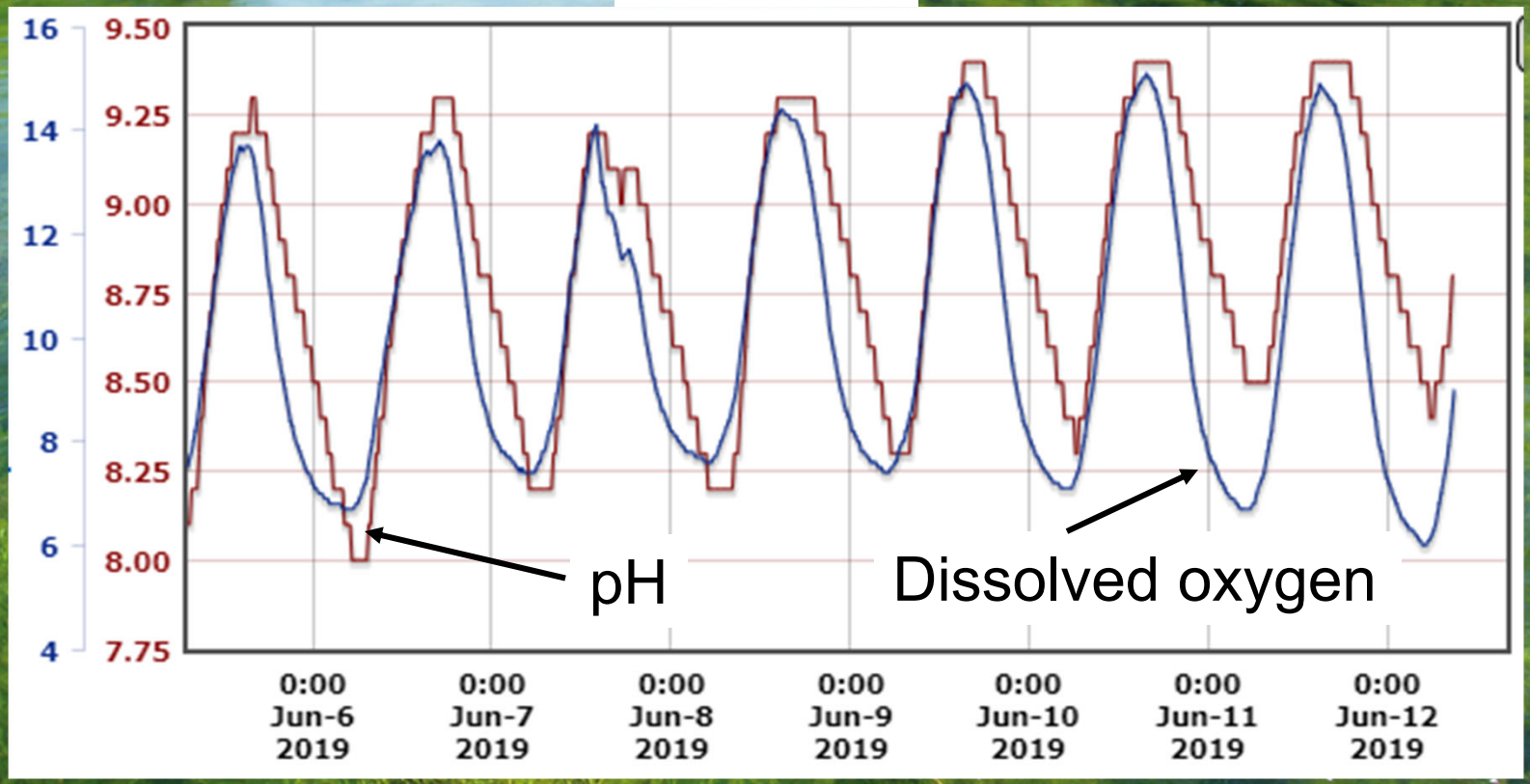
Kiona



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Preliminary Data – Subject to Revision

Project Scope

- Install three continuous water quality sites on the lower Yakima River
  - Prosser, Kiona, Van Giesen
  - Parameters: Temperature, conductivity, dissolved oxygen, pH, Turbidity, light, stage
  - Continuous nitrate at Kiona and Van Giesen
- Prosser and Kiona started in June 2018, Van Giesen in August 2018.
  - Continue for 2 years

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Project Scope

- Document stargrass growth over time
  - Estimate percent cover and biomass from June through September
  - Examine relationships between water quality and plant growth

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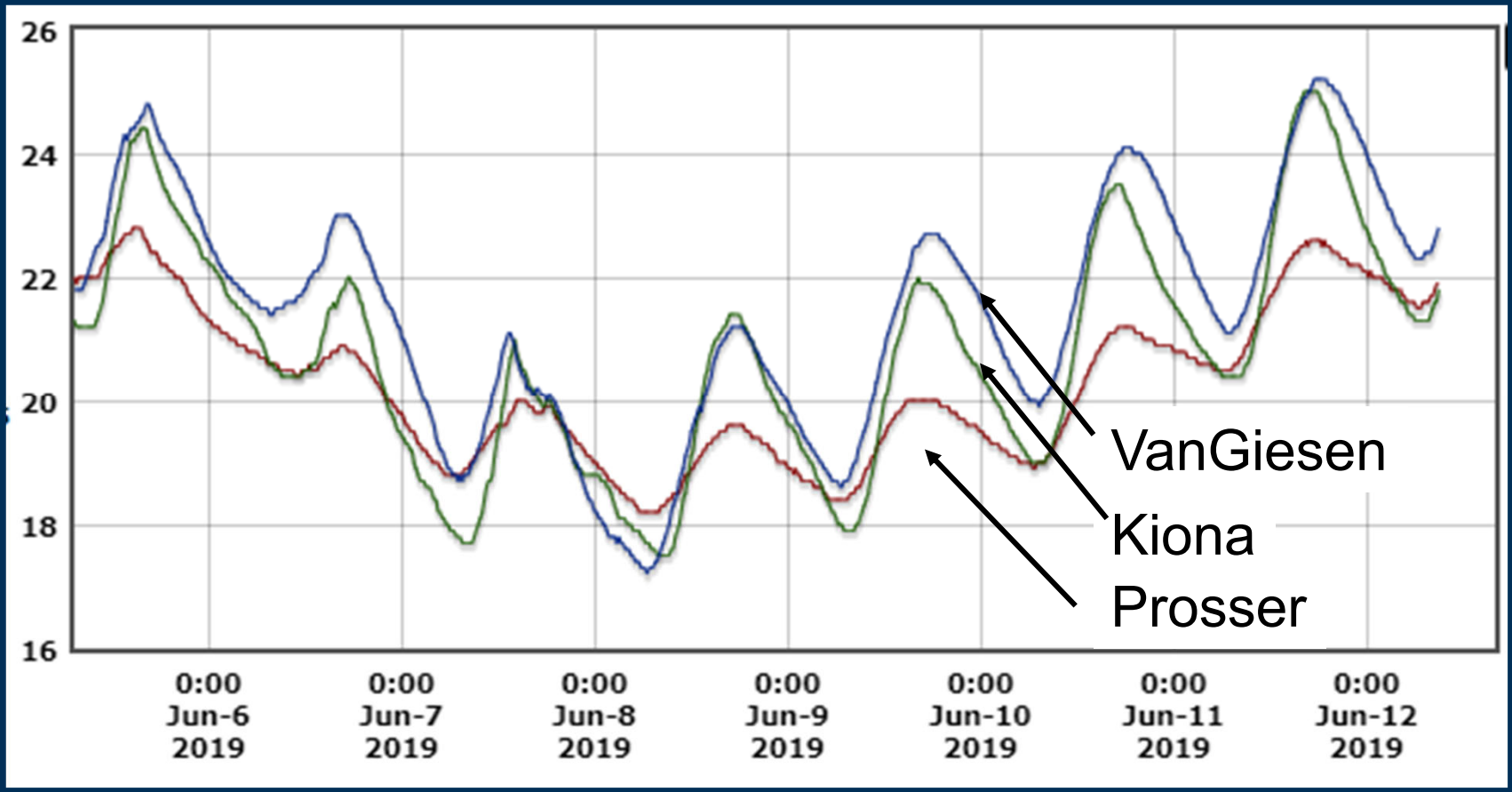
Current temperatures



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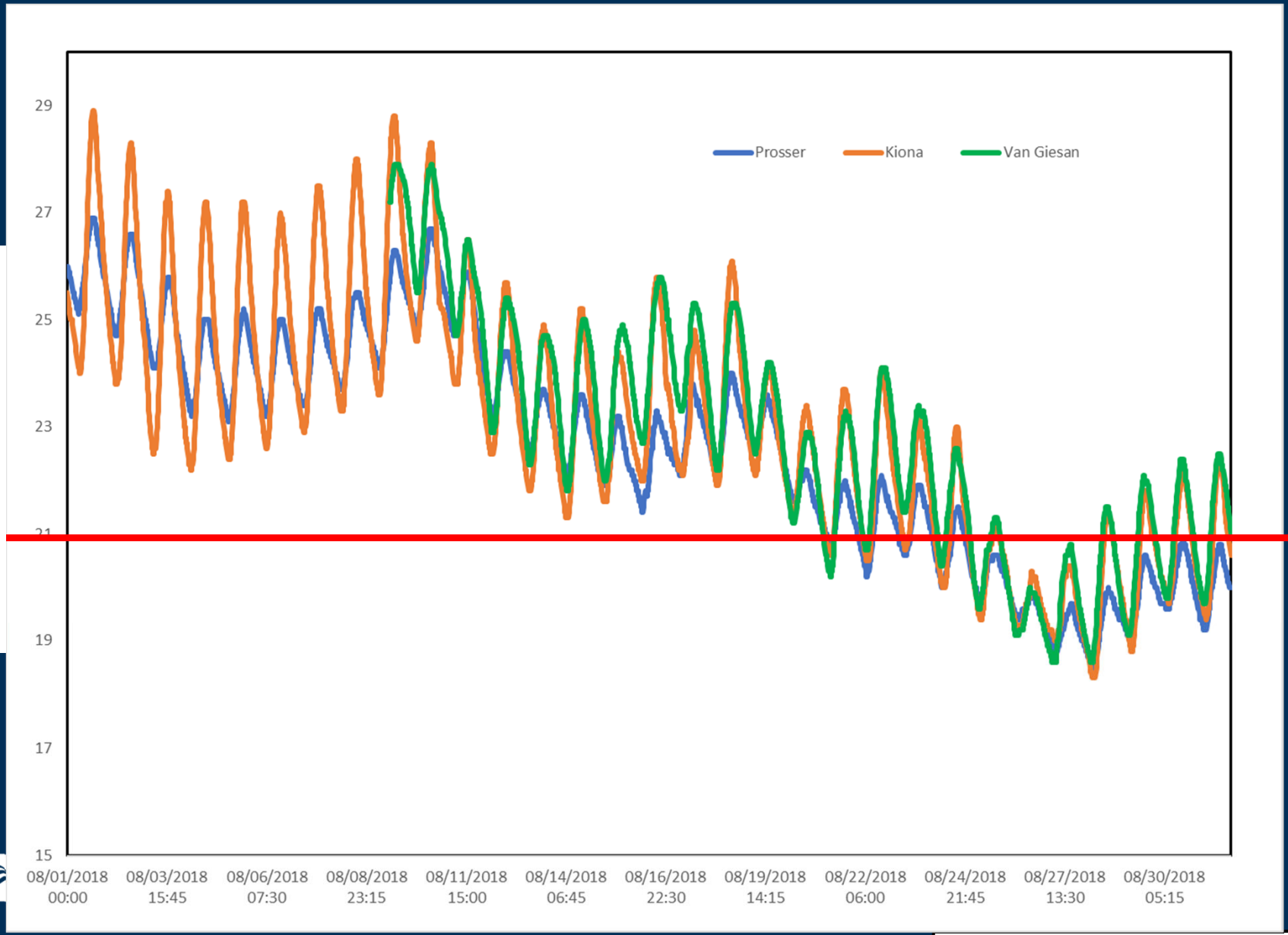
August 2018 Temperature



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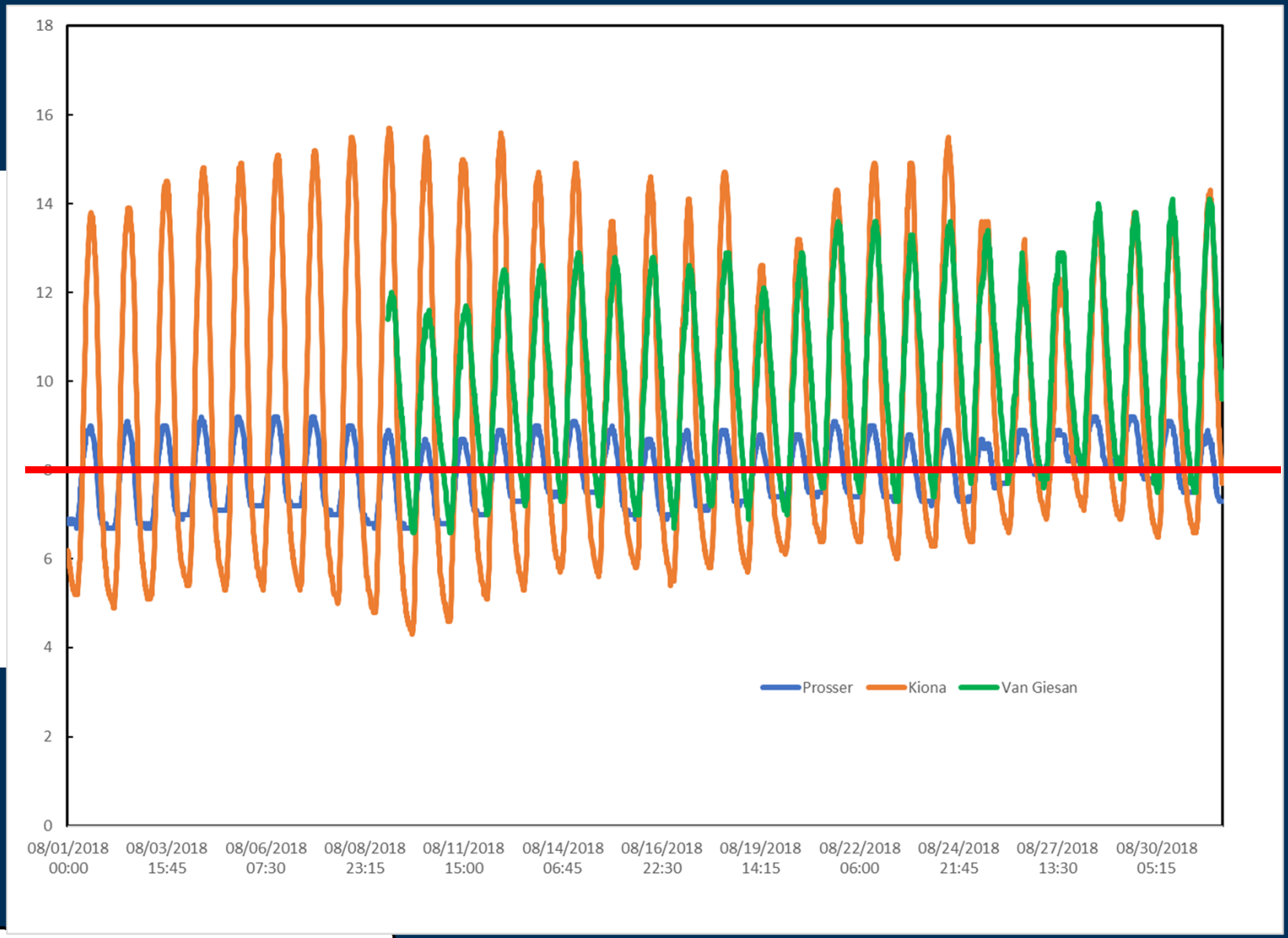
Dissolved Oxygen (Aug 2018)



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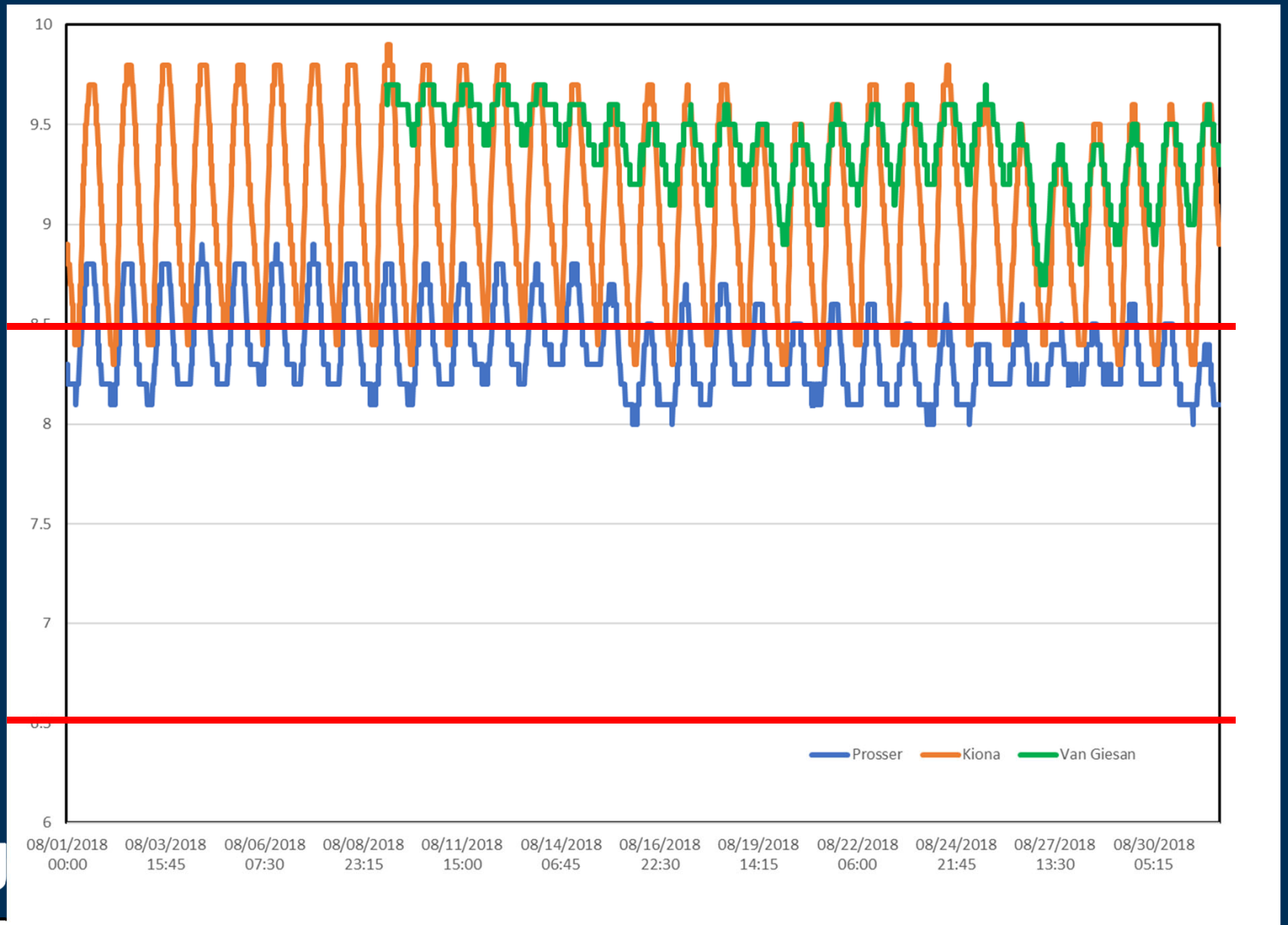
pH Aug 2018



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Daily max temperature

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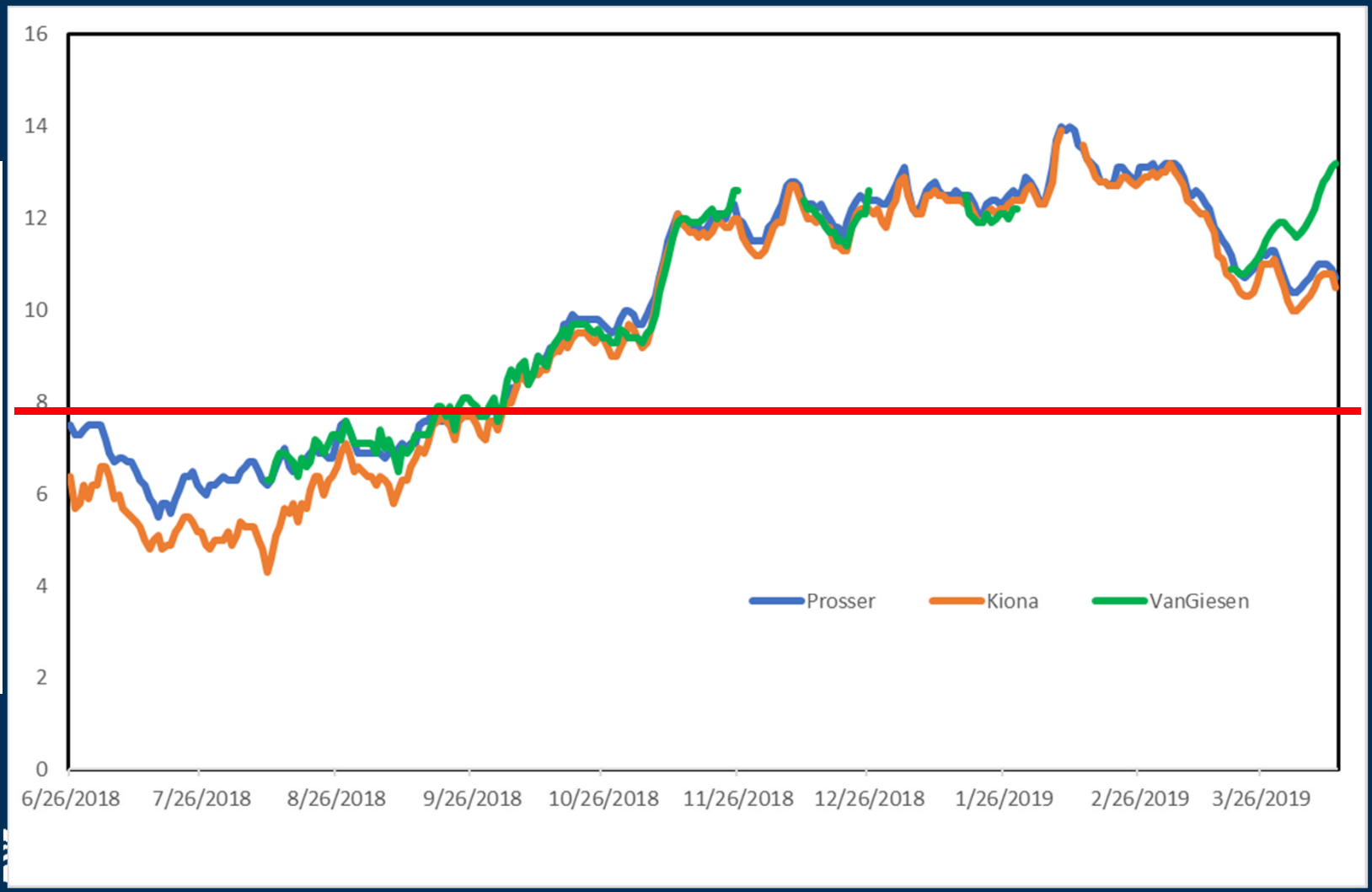
Daily minimum DO



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Stargrass Estimates

- Estimated stargrass cover and biomass in August 2018 at all three sites
- Used a point transect method to document presence absence of stargrass
- Measured approximately 150m long reaches, with a minimum of 10 transects
- Harvested 10 samples from each site of known area, tried to capture variability

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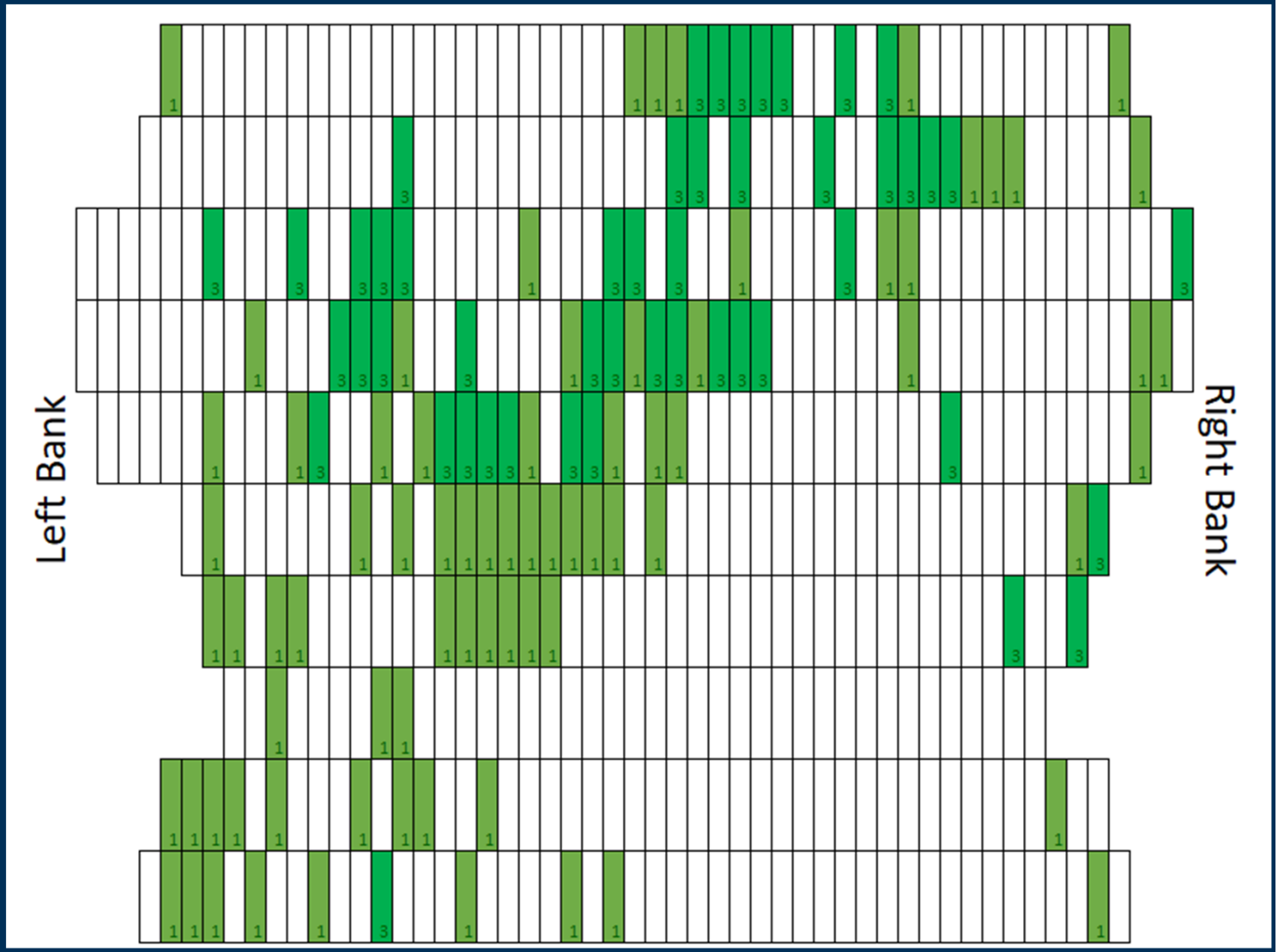
Stargrass Cover

Van Giesen



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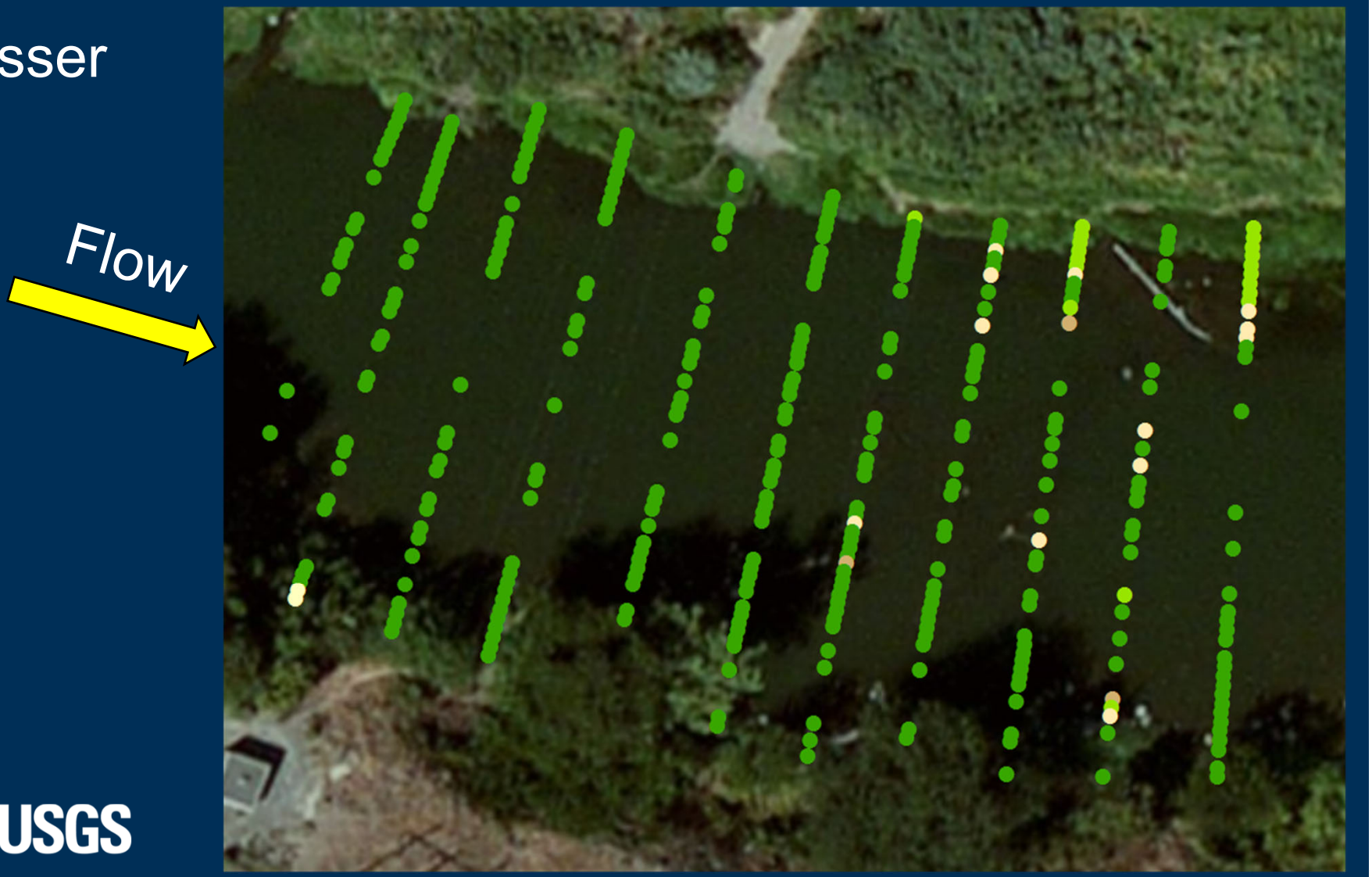
Stargrass Cover

Prosser



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Stargrass Cover

- Measured 600-1000 points per reach
- Percent cover estimates:
  - Prosser – 48%
  - Kiona – 62%
  - Van Giesen – 27%

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Stargrass Biomass

- Harvested 10 samples per reach
- Rinsed within river, collected above ground biomass
- Bagged and frozen until lab processing
  - Dried at 70^{o}C for 2 to 7 days to constant weight

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Stargrass Biomass

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Stargrass Biomass

- Prosser -1422 g/m2
- Kiona – 360 g/m2
- Van Giesen – 412 g/m2

- Standing stock in kilograms
  - Prosser – 4100 kg
  - Kiona – 2340 kg
  - Van Giesen – 670 kg

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Stargrass other observations

- Prosser - deep, slow velocity – large plants
- Kiona – fast flowing, mid-range depths, big plants on margins of channel
- Van Giesen – fast flowing, shallow, much smaller plants

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Summary

- With respect to temperature and dissolved oxygen, summer conditions are impaired.
- Standing stock of water stargrass varies across the sites
  - Temporally – June through Aug/Sept
  - Can we relate to water quality?
    - Daily min/max or range versus biomass
  - What is controlling water stargrass growth?

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Questions?

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