

Water Quality Monitoring and Research in Somenos and Quamichan Lake



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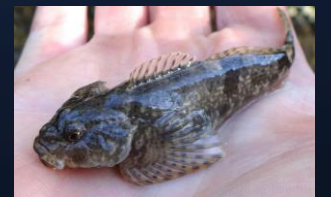


Focus subjects of this presentation are water quality and fish habitat

- Historic monitoring and research
- Current monitoring and research
- Water quality trends
- Fish habitat trends
- Management and research options

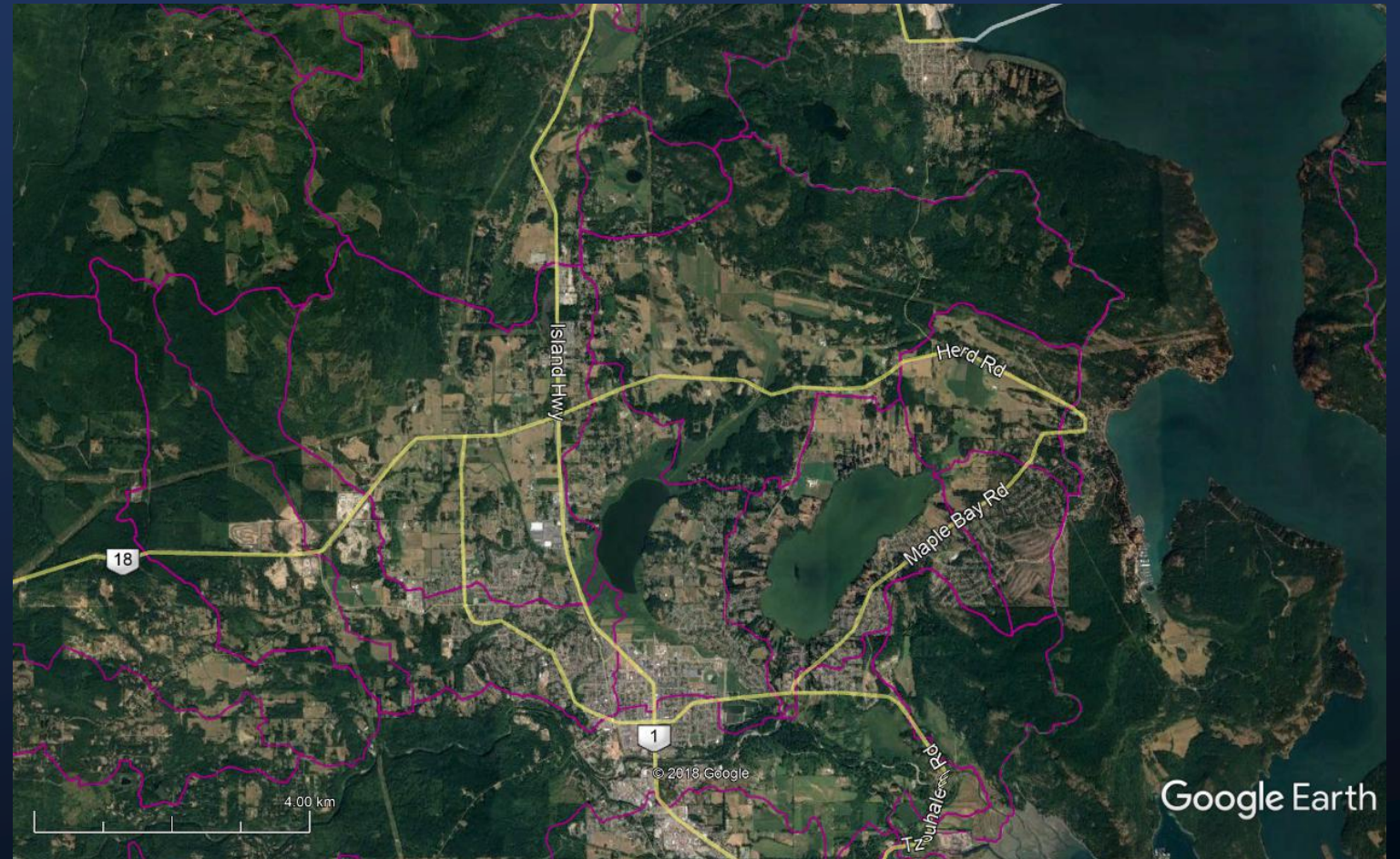
Meet the neighbors

- Coho Salmon
- Rainbow Trout
- Cutthroat Trout
- Chum Salmon
- Three-Spined Stickleback
- Peamouth Chub
- Sculpin
- Pumpkinseed Sunfish



Our Shared Watersheds

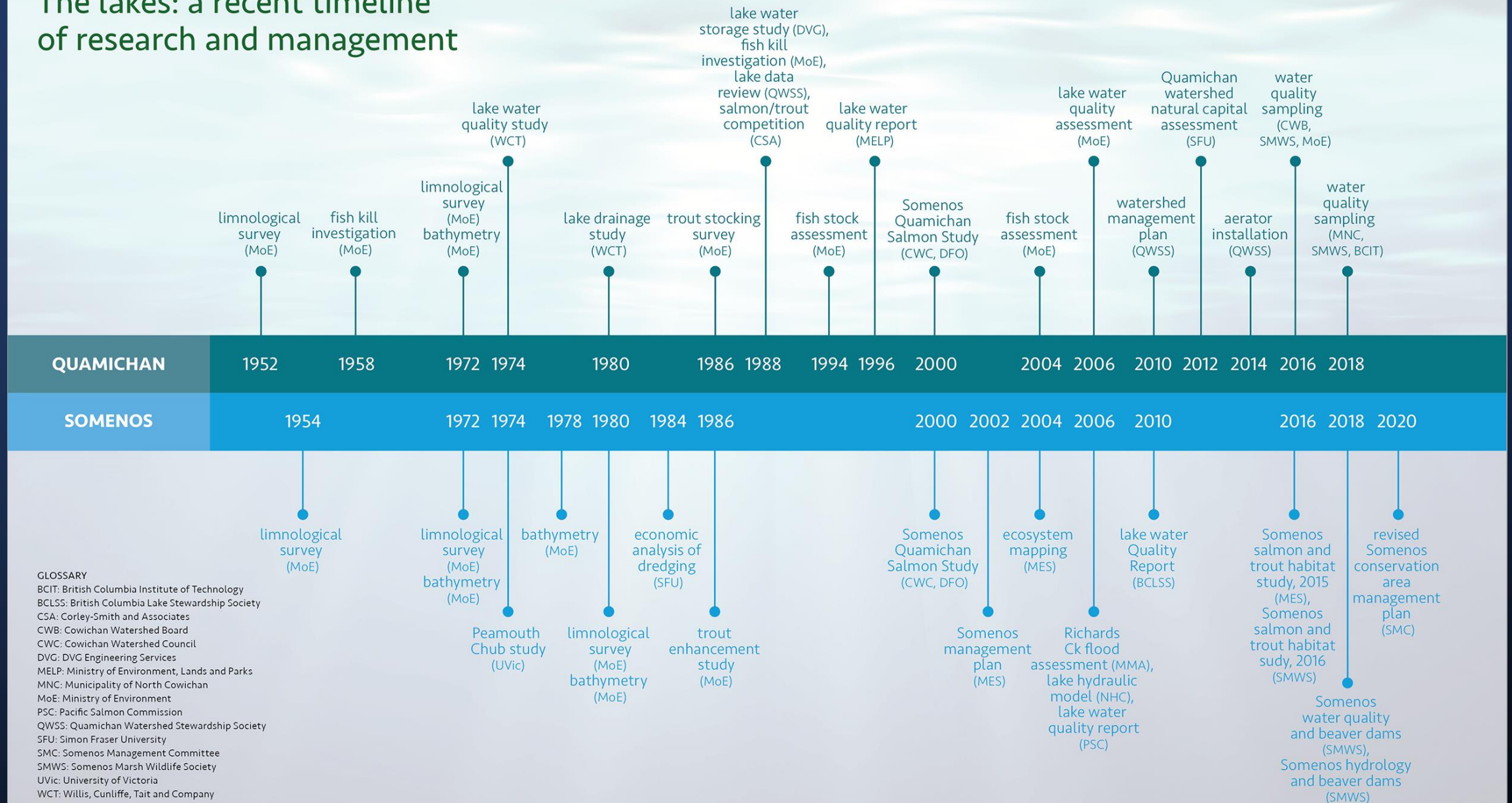
- Heavily impacted by forestry, agriculture and urban development



Historic (1859) water courses and land use



The lakes: a recent timeline of research and management







9 April 2019





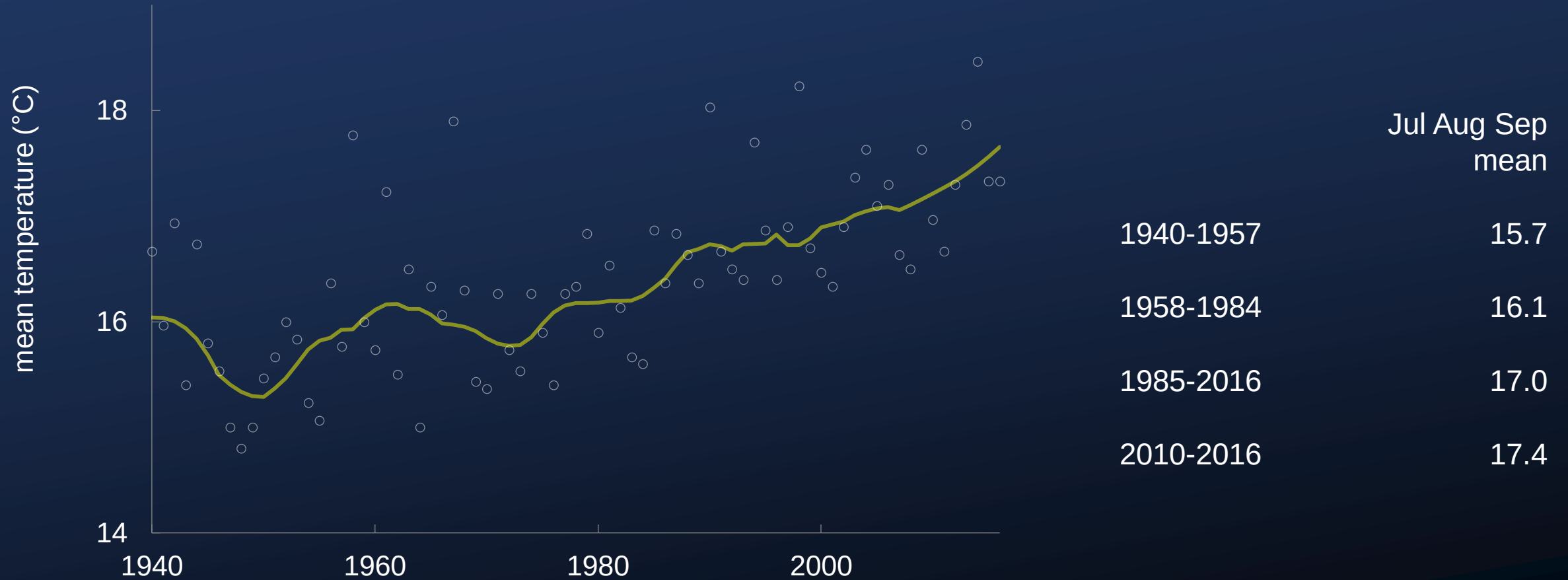
9 April 2019

How did we get here?

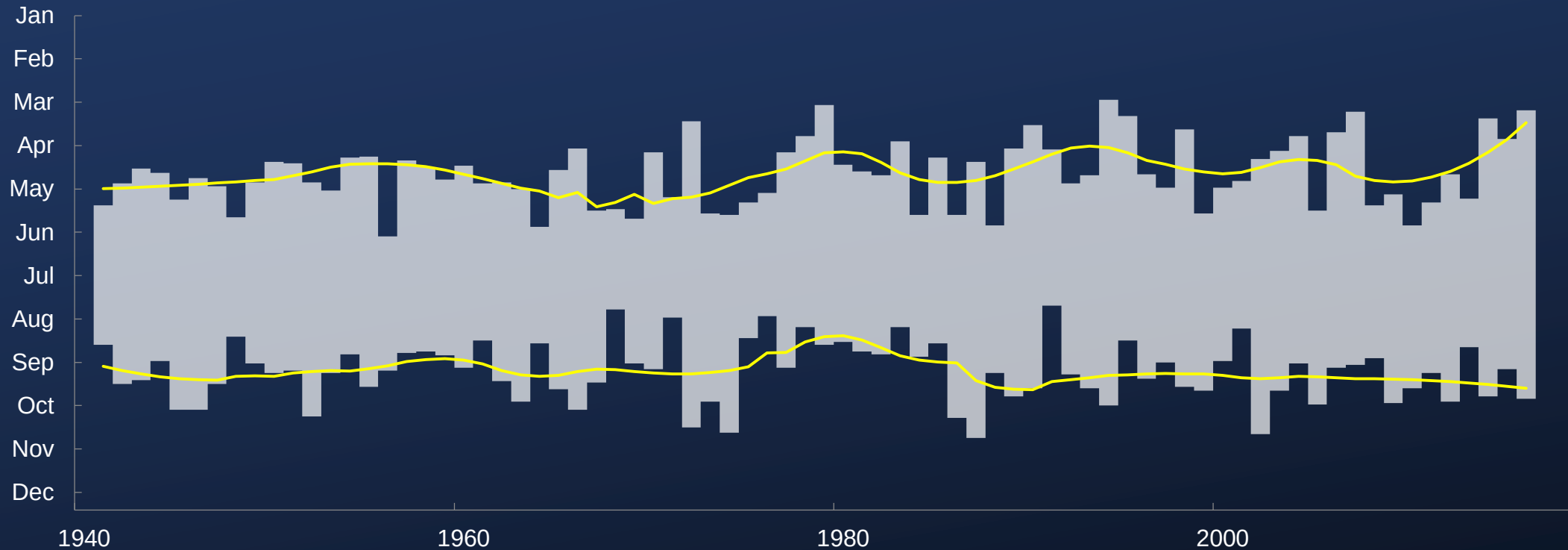
- Changes to water courses
- Changes in land cover
- Changes in climate
- Changes in land use practices

To find a way out we need to monitor and conduct research that informs effective management decisions

Jul, Aug, Sep is now warmer



Summer dry season is now longer

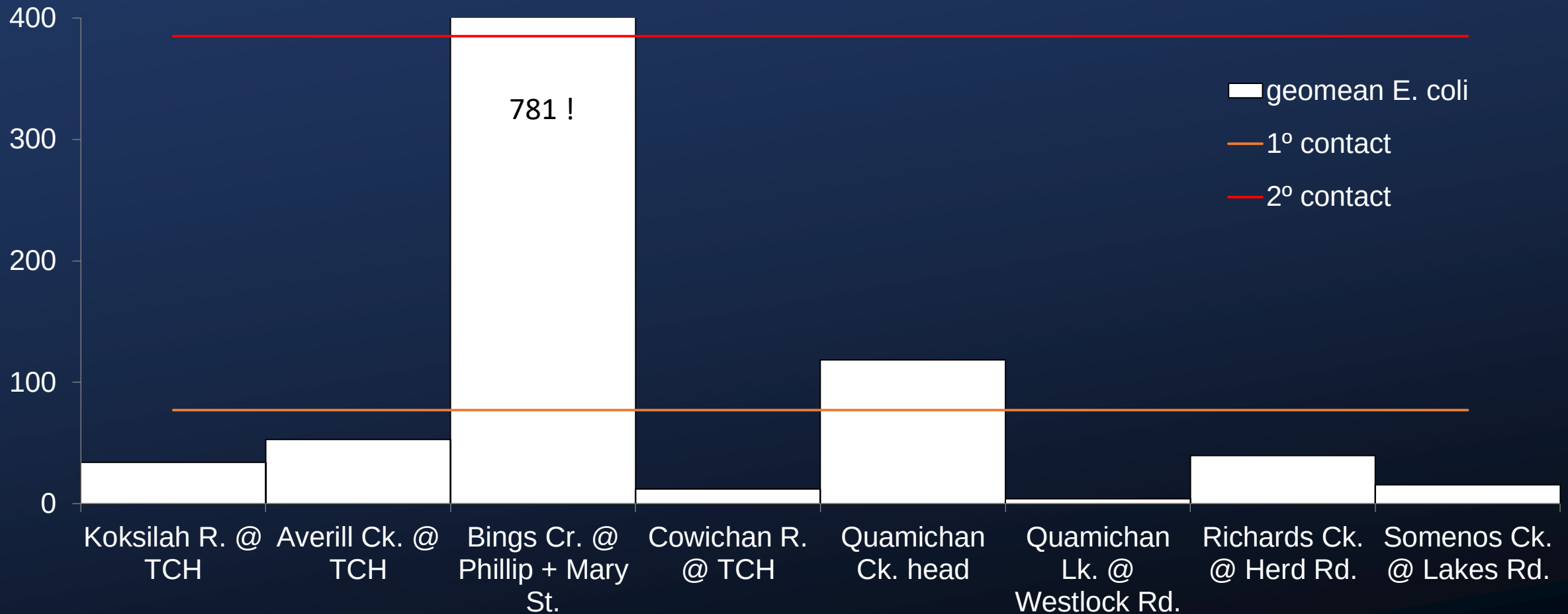


	Start	End	Days
mean 1940-1983	29-Apr	14-Sep	138
mean 1984-2016	19-Apr	23-Sep	157
mean 2010-2016	14-Apr	27-Sep	166

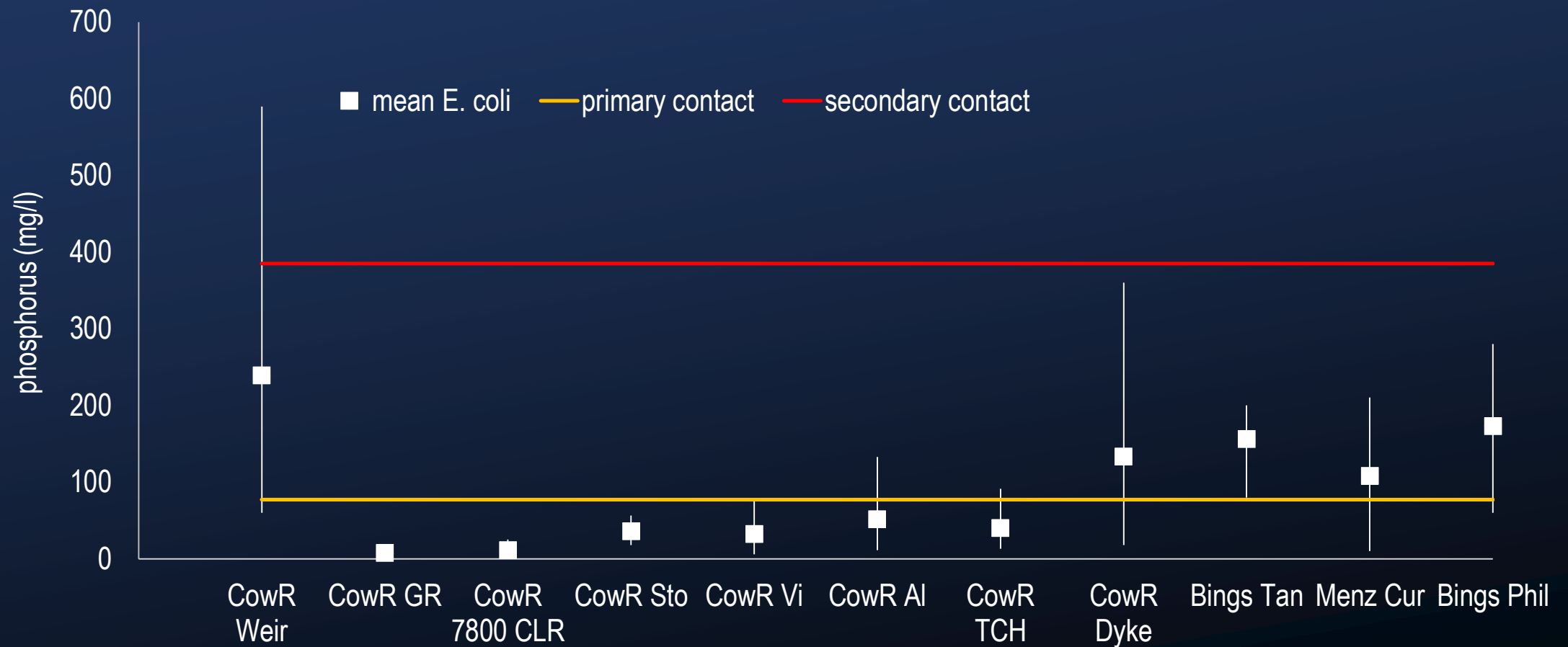
Cowichan/Koksilah *E. coli* water quality targets

- primary contact: ≤ 77 CFUs/100 mL
- secondary contact: ≤ 385 CFUs/100 mL

E. coli (CFU/100ml) vs primary and secondary contact guidelines 2018: mostly creeks



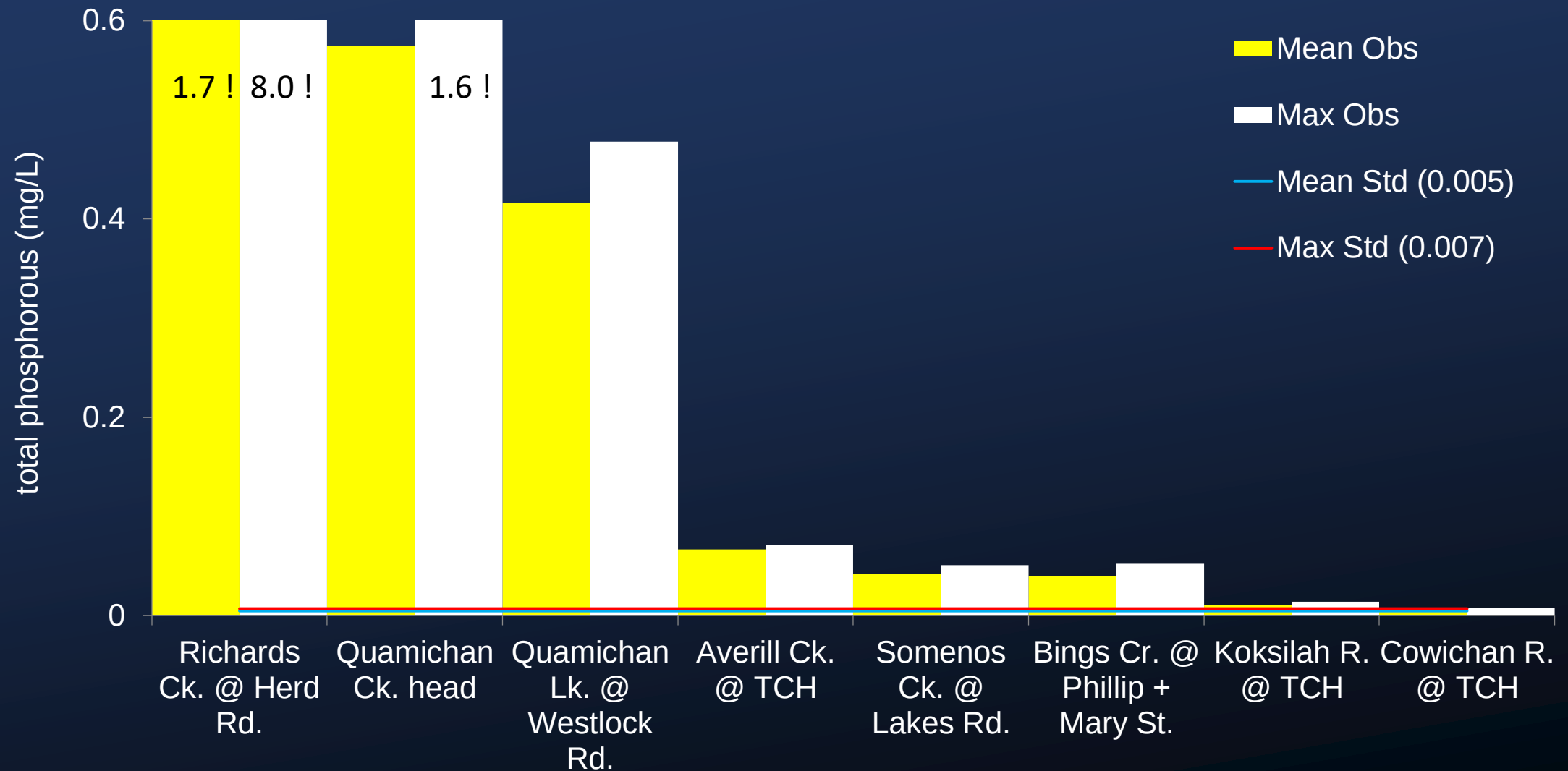
E. coli (CFU/100ml) mean/max/min vs **primary** and **secondary** contact guidelines 2018: mostly creeks



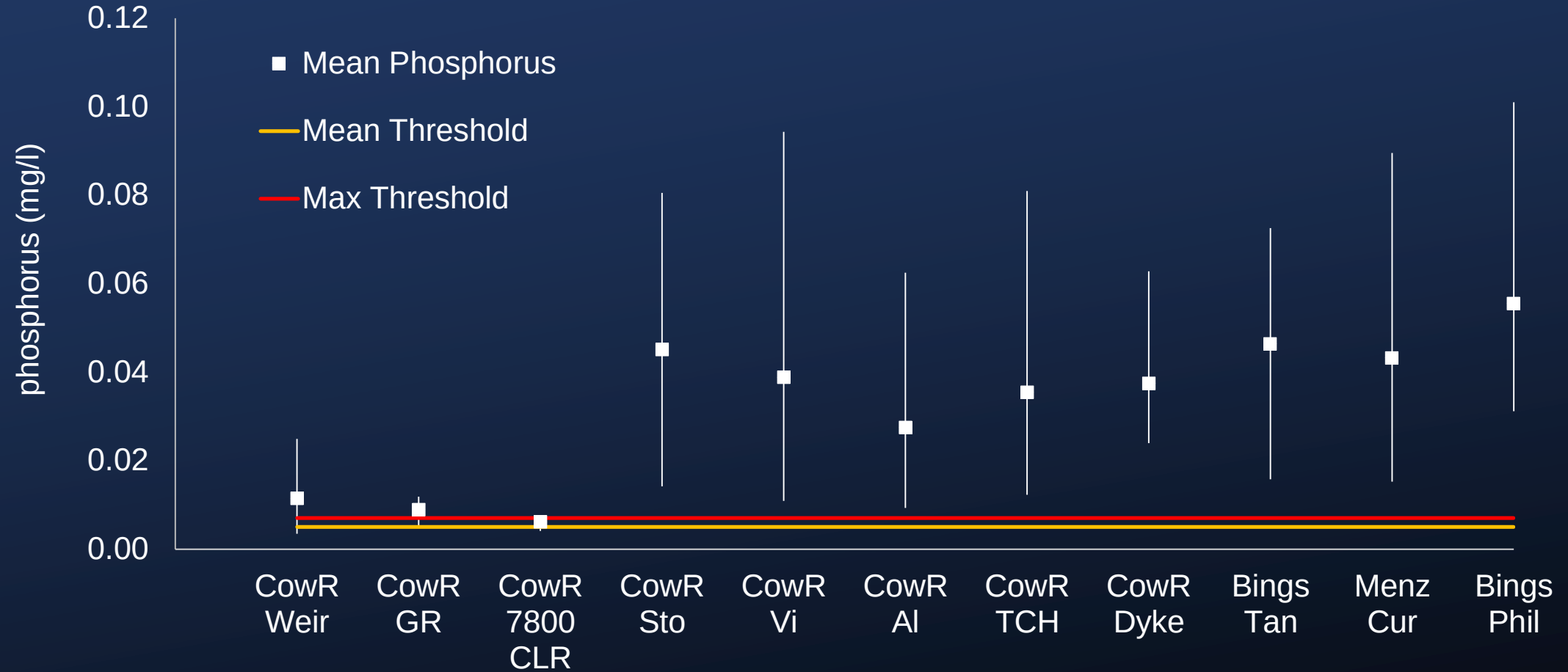
Cowichan / Koksilah phosphorus objectives

- Objectives set for low discharge period only
- mean of 5 samples: 0.005 mg/L
- max of 5 samples: 0.007 mg/L

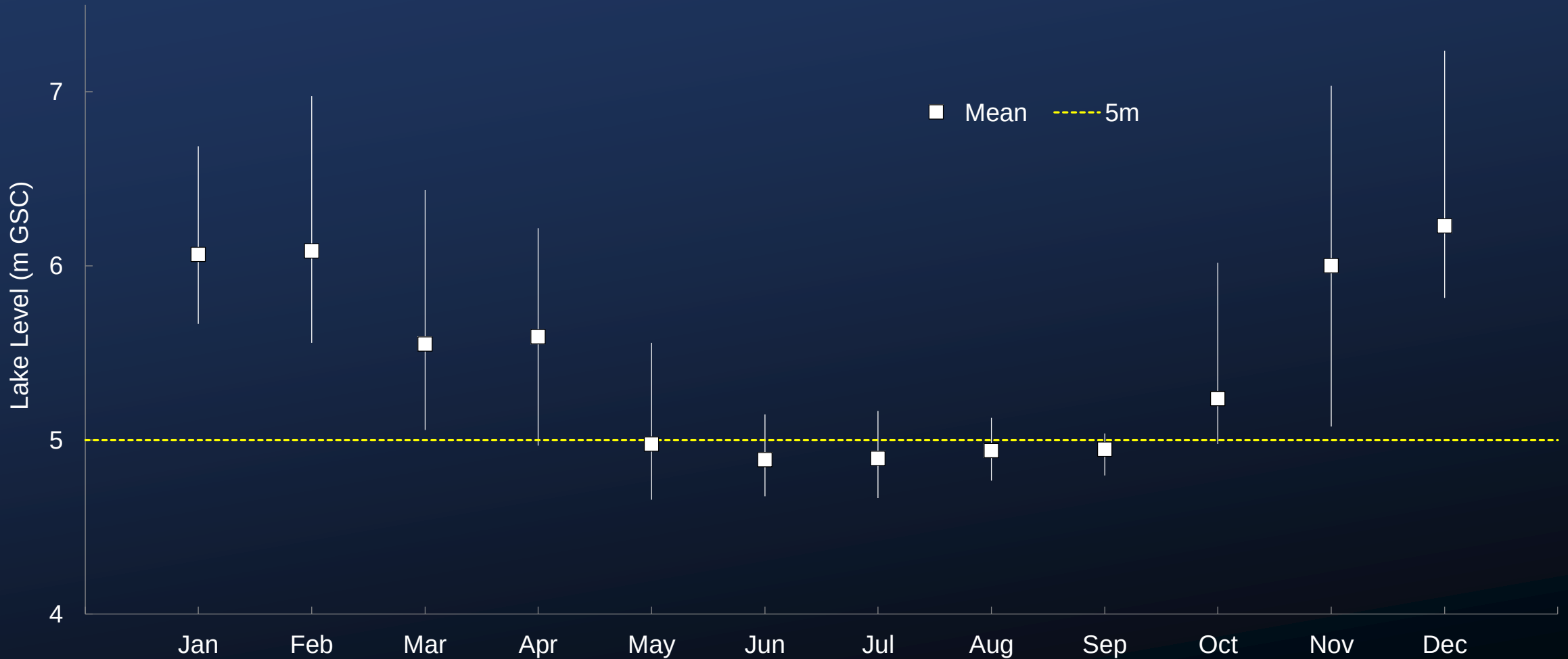
Somenos/Quamichan phosphorus 2017: mostly lakes



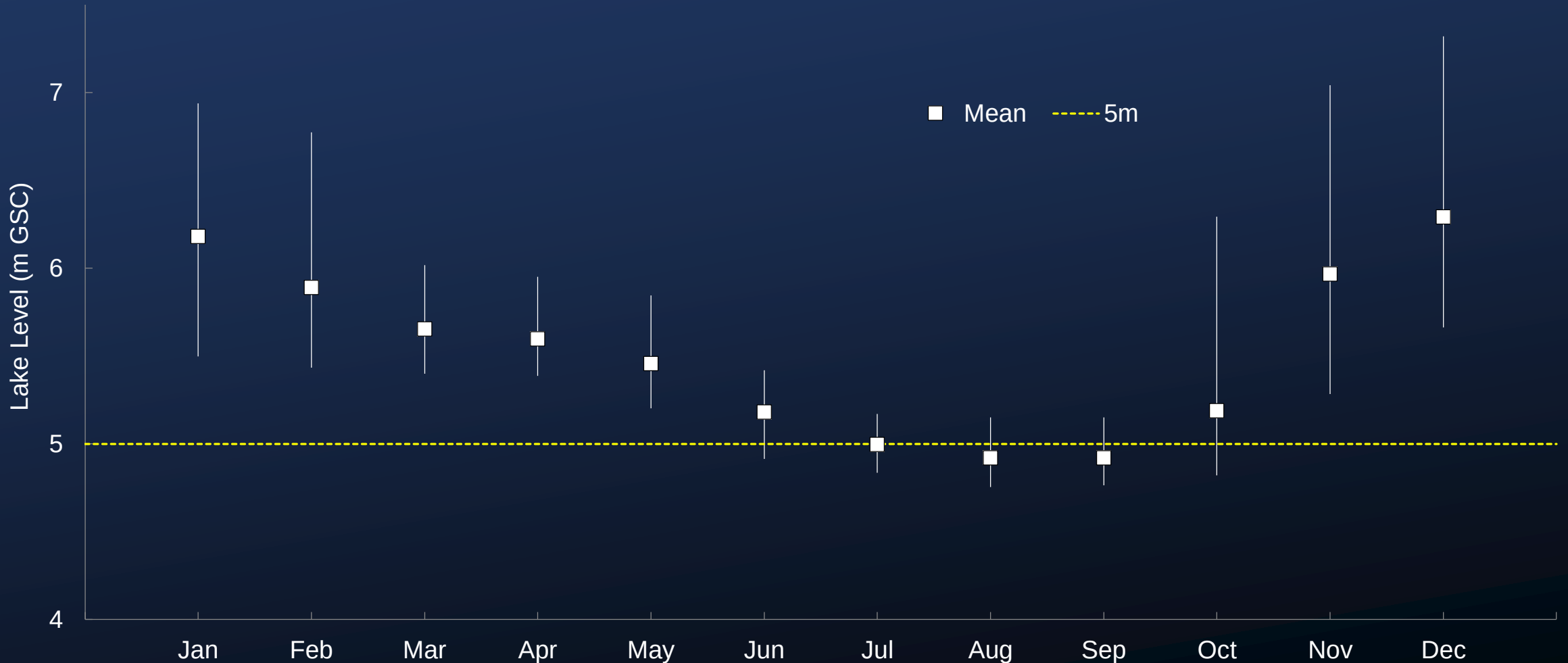
Somenos/Quamichan phosphorus 2018: mostly creeks



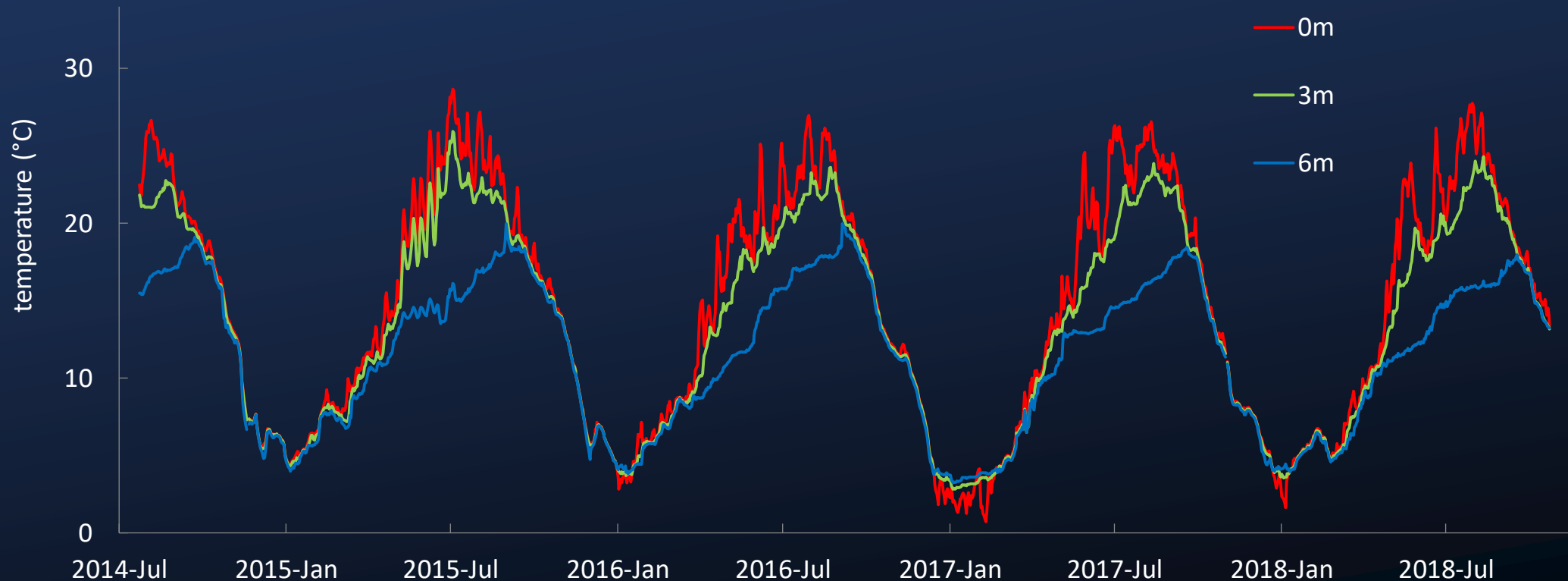
Somenos Lake Monthly Mean, Maximum, and Minimum Lake Levels (2015-2018)



Somenos Lake Monthly Mean, Maximum, and Minimum Lake Levels (early 1960s)



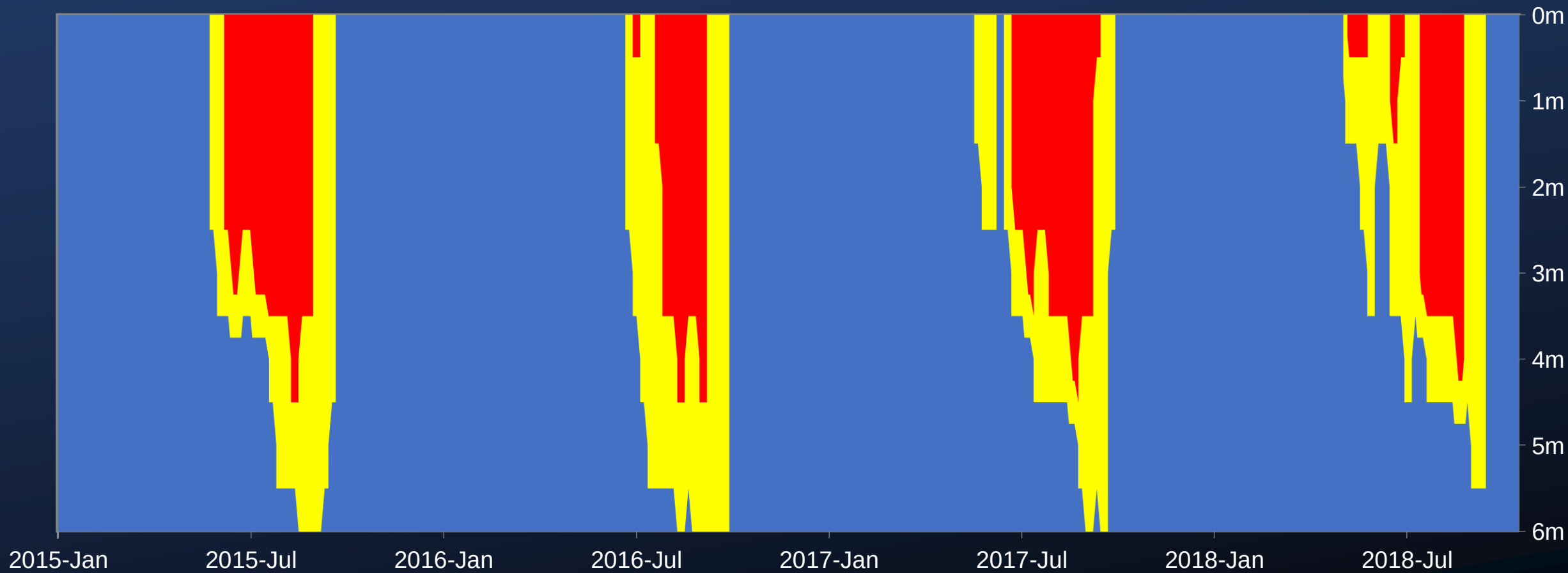
Somenos Lake Daily Temperature from data loggers 2014-2018



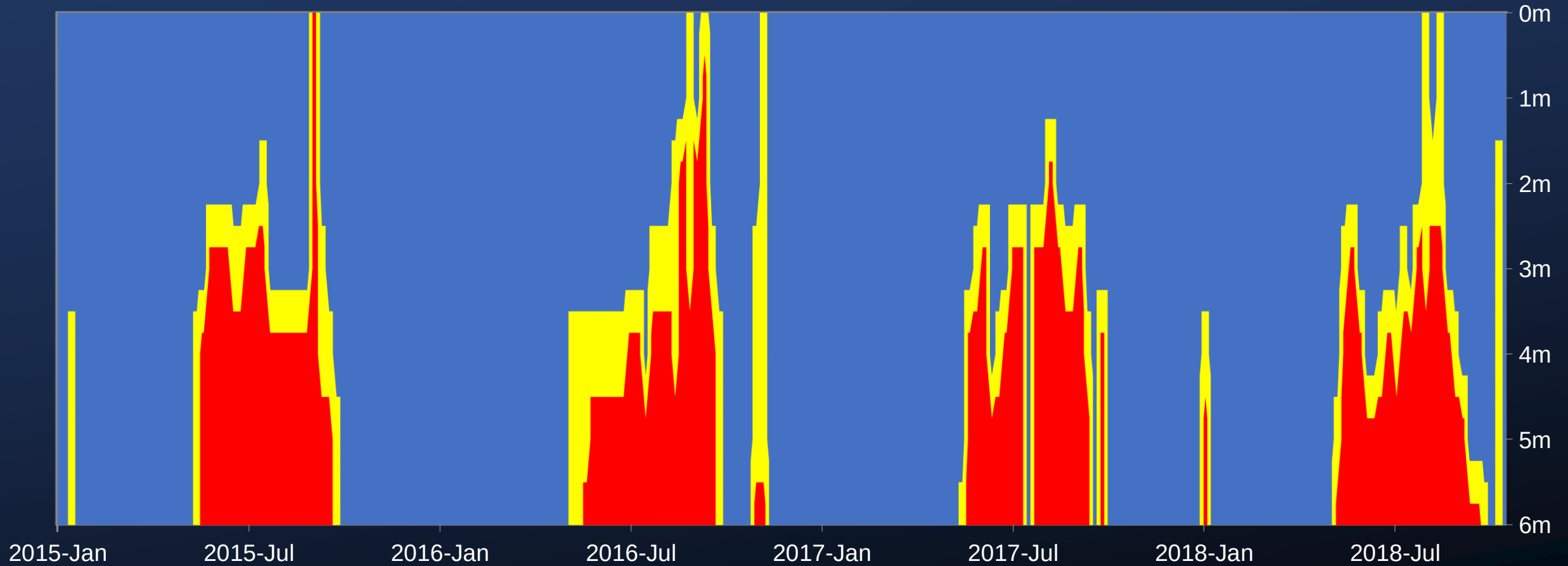
Somenos Lake Water Quality Monitoring Data for Salmon and Trout Habitat

- light blue = good for fish health
- yellow = marginal for fish health
- red = lethal to fish
- Data collected once a week from April 1 to October 31 and once per month from November 1 to March 31
- Samples at 0,1,2,3,4,5,and 6m for T, DO, pH, conductivity and total dissolved solids
- Samples collected at 0, 3, 5m for total phosphorous

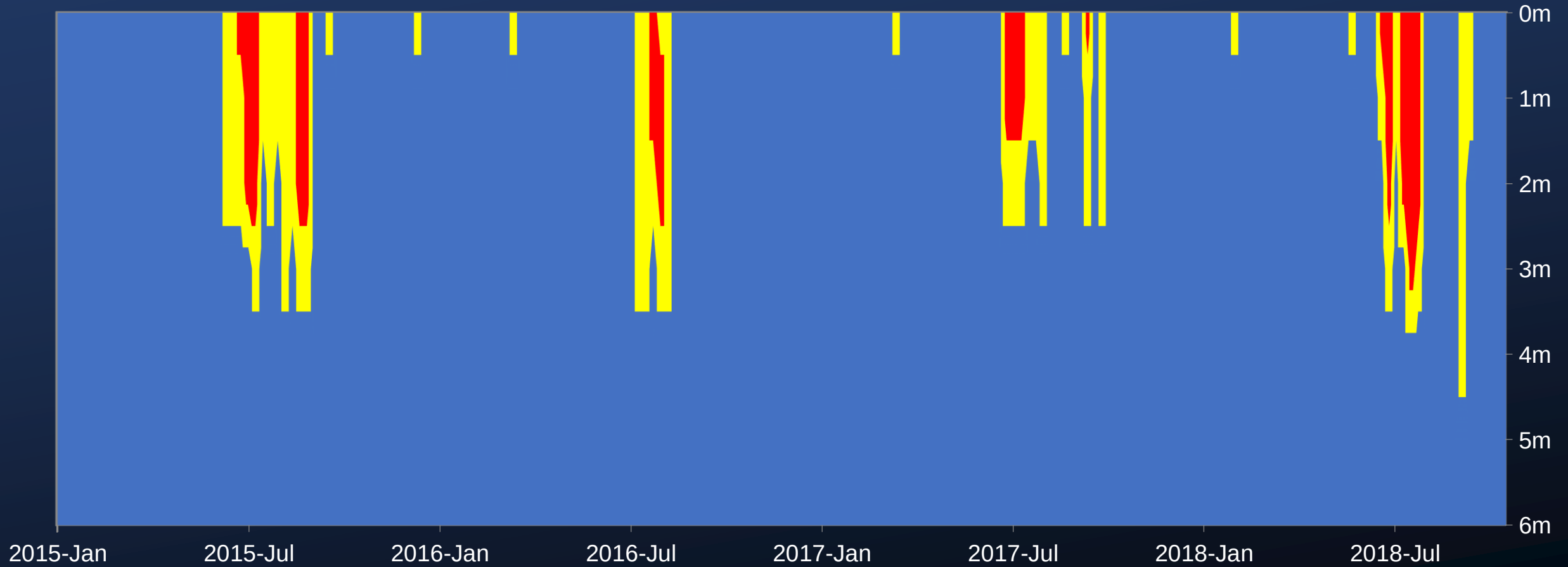
Temperature 2015-2018



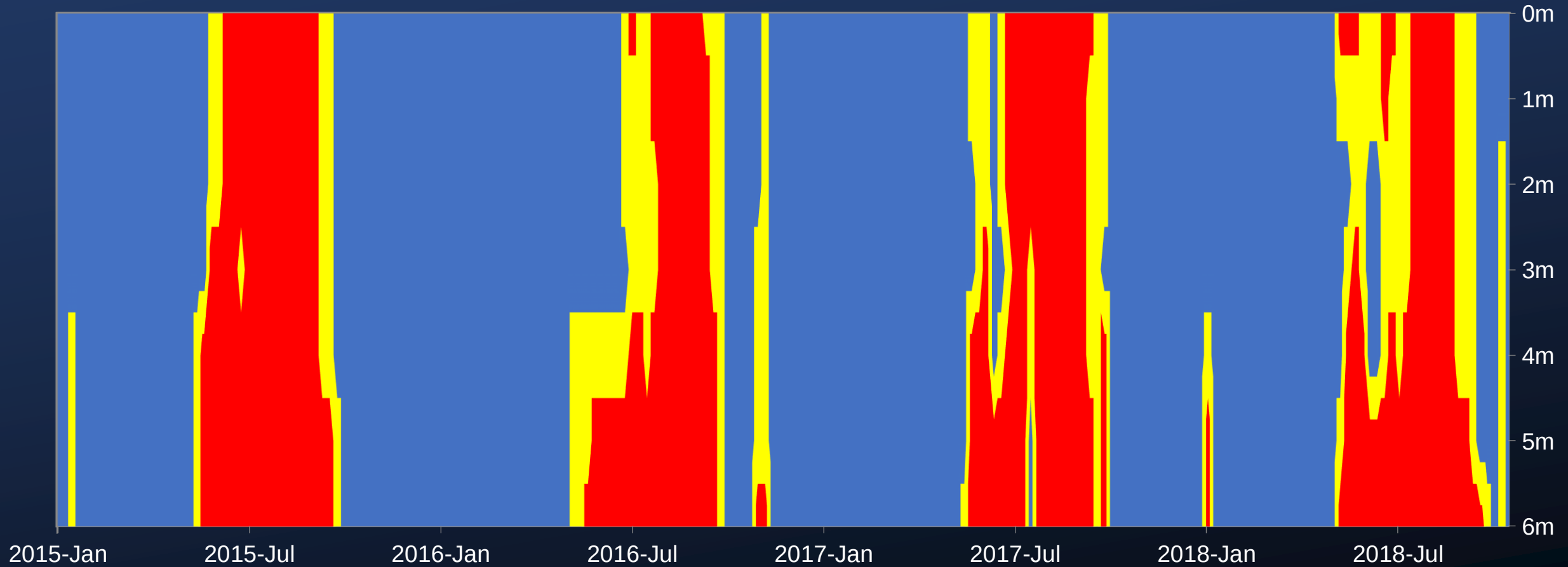
Oxygen 2015-2018



pH 2015-2018



Combined 2015-2018



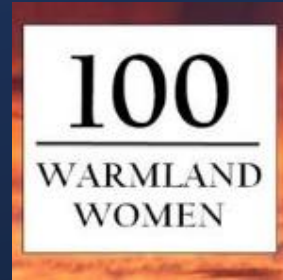
Solutions Are Possible

- Create wetlands where possible as point source remediation of pollutants, *e.g.*, Beverly Wetland
- Encourage riparian vegetation buffers to slow water movement and storage in the soil, *e.g.*, Clean Water Action Plan
- Develop water storage to protect and enhance stream habitat for salmon and trout, *e.g.*, Crofton Lake weir
- Work with land owners to minimize discharges of nutrients and pollutants, *e.g.*, Clean Water Action Plan

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The Olivia Niven
Estate



SMWS partners for
water quality sampling

