

Climate, Cows, and Water Degradation in Wisconsin

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**Feed containing
Bacteria, Nitrogen
Phosphorus**

Antibiotics

Water

LIVESTOCK



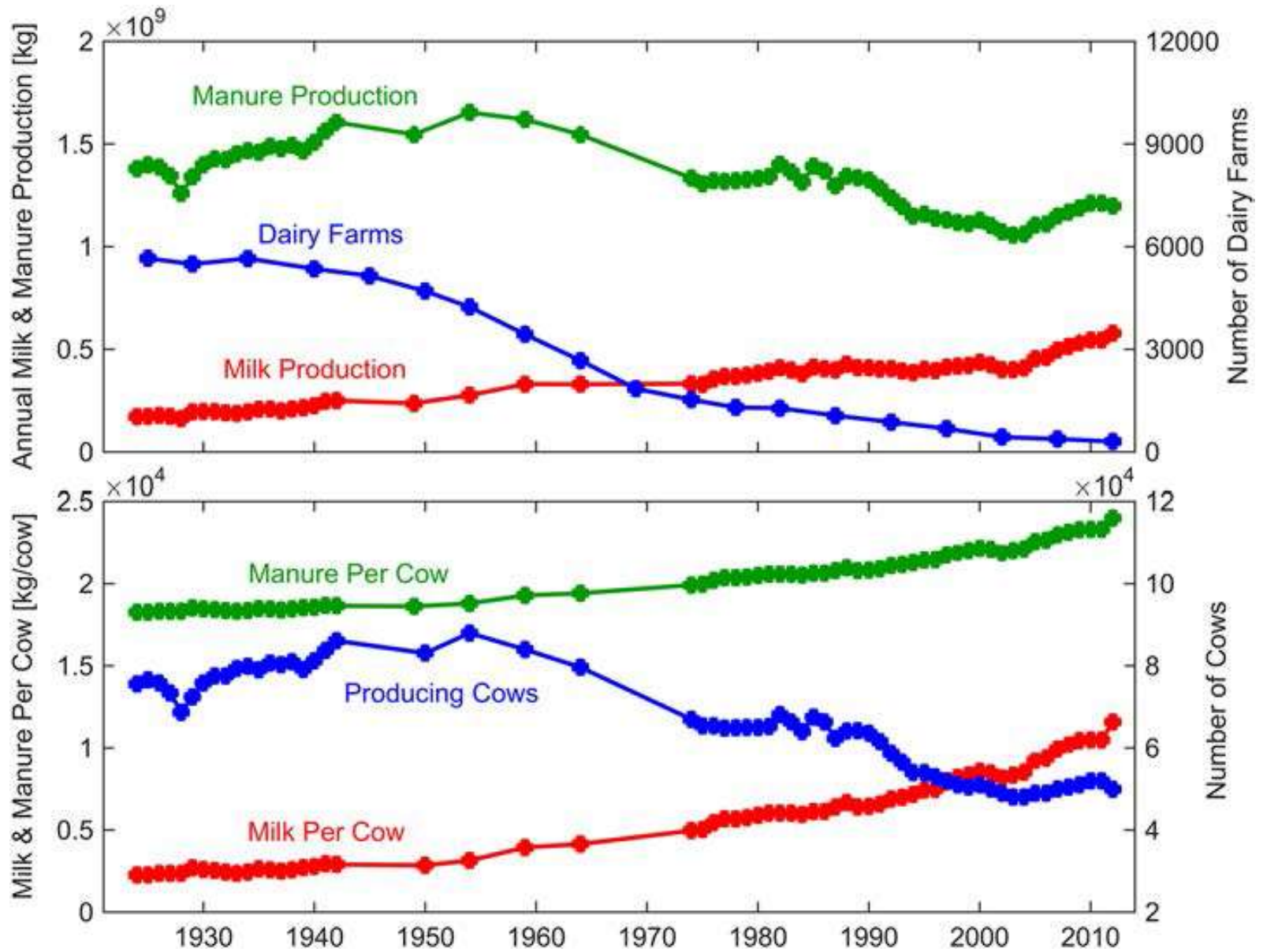
Nitrate

**Resistant
Bacteria**

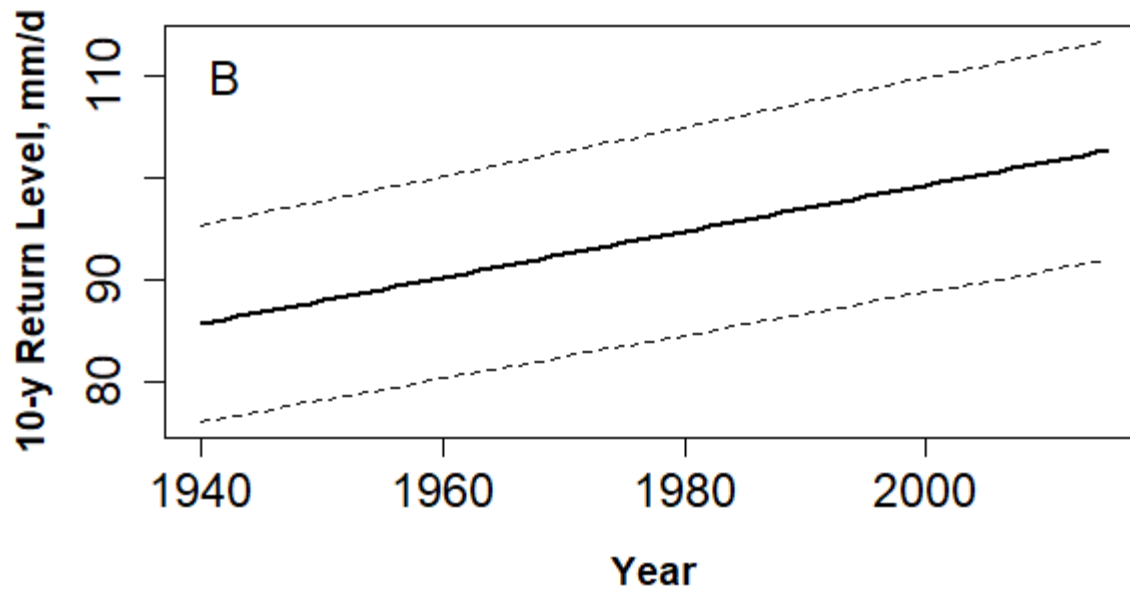
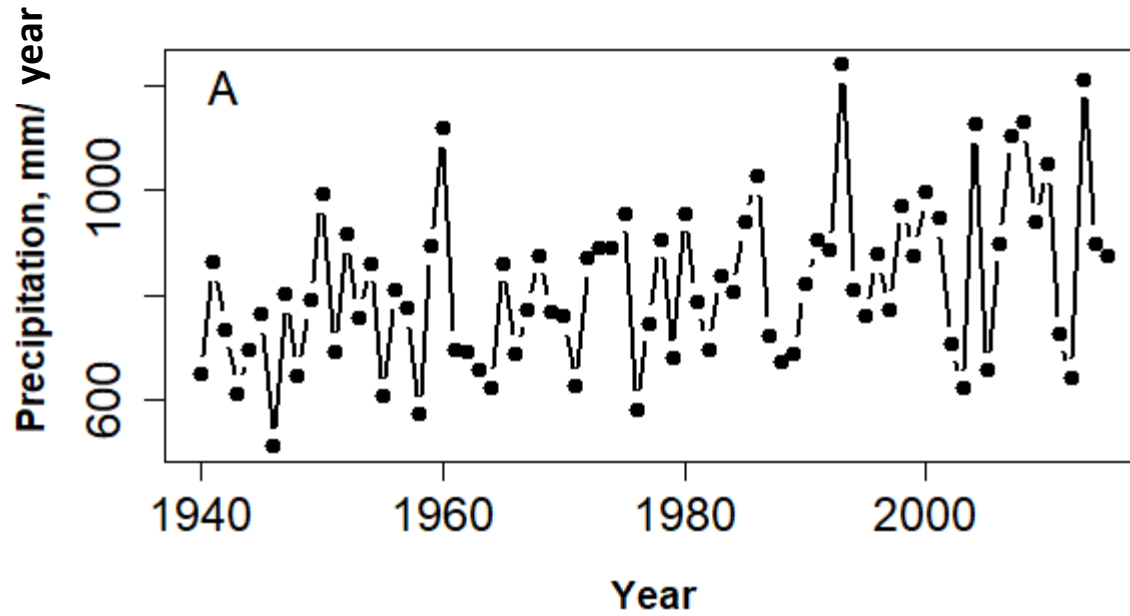
Phosphorus

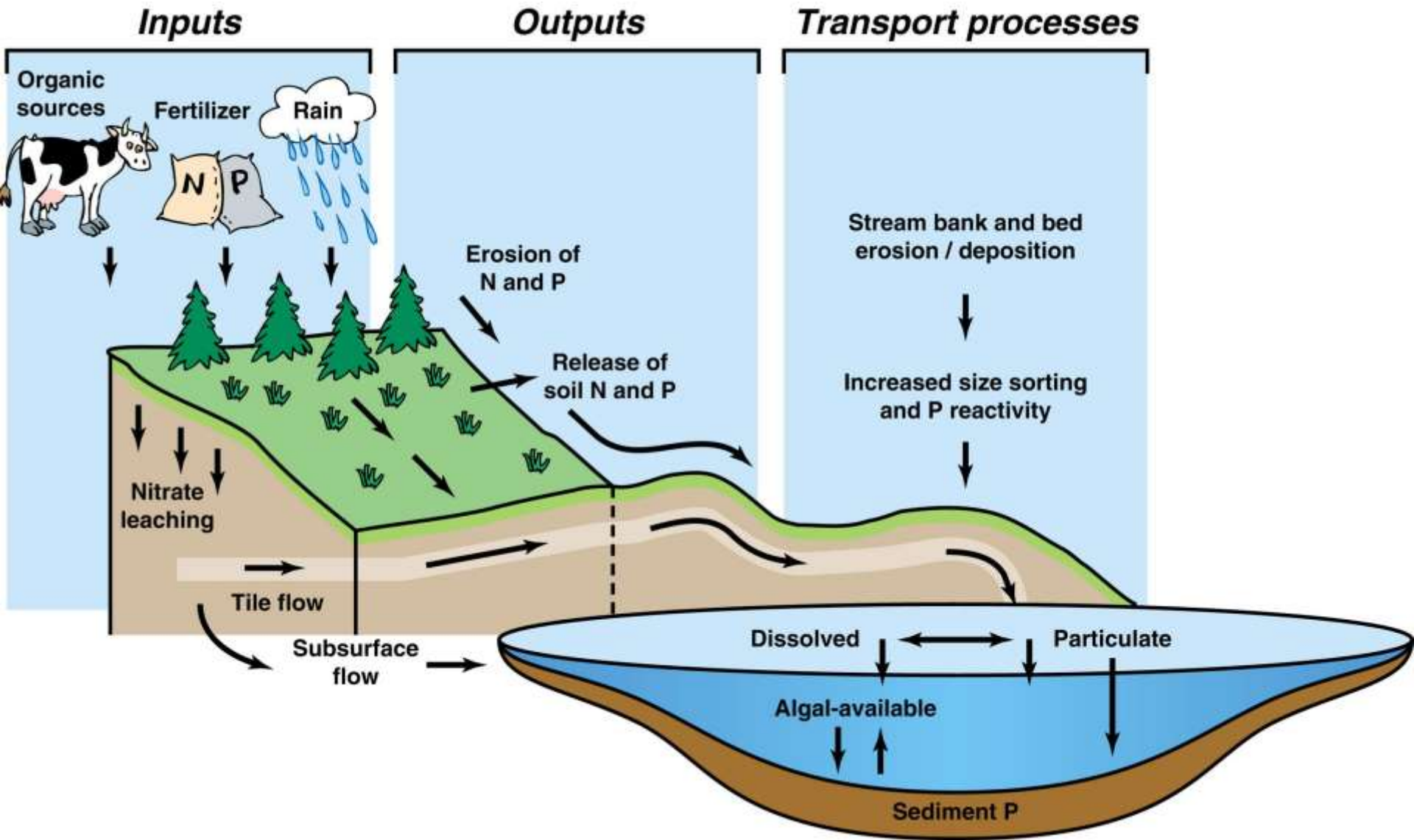
to groundwater, wells, surface water

to streams and lakes



Precipitation and Extremes are Increasing in Dane County





Cyanotoxins in the Madison Lakes

Microcystins : Cyclic peptides; cause liver damage in mammals, fish, invertebrates.

Anatoxin, Saxitoxin: Alkaloid; attacks synapse; respiratory paralysis in mammals



Chorus, I. (ed). 2001. Cyanotoxins: Occurrence, Causes, Consequences. Springer, NY

Stewart, I., P. Webb, P. Schluter, and G. Shaw. 2006. Recreational and occupational field exposure to freshwater cyanobacteria - a review of anecdotal and case reports, epidemiological studies and the challenges for epidemiologic assessment. Environmental Health: A Global Access Science Source 5:6. doi:10.1186/1476-069X-5-6

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END

(backup slides follow)

Main Points

Pollution of the land surface with manure and fertilizers is not changing.

These pollutants enter groundwater, including drinking water wells, and surface waters.

Human health concerns include:

Nitrate and antibiotic-resistant microbes in drinking water

Cyanotoxins in lakes

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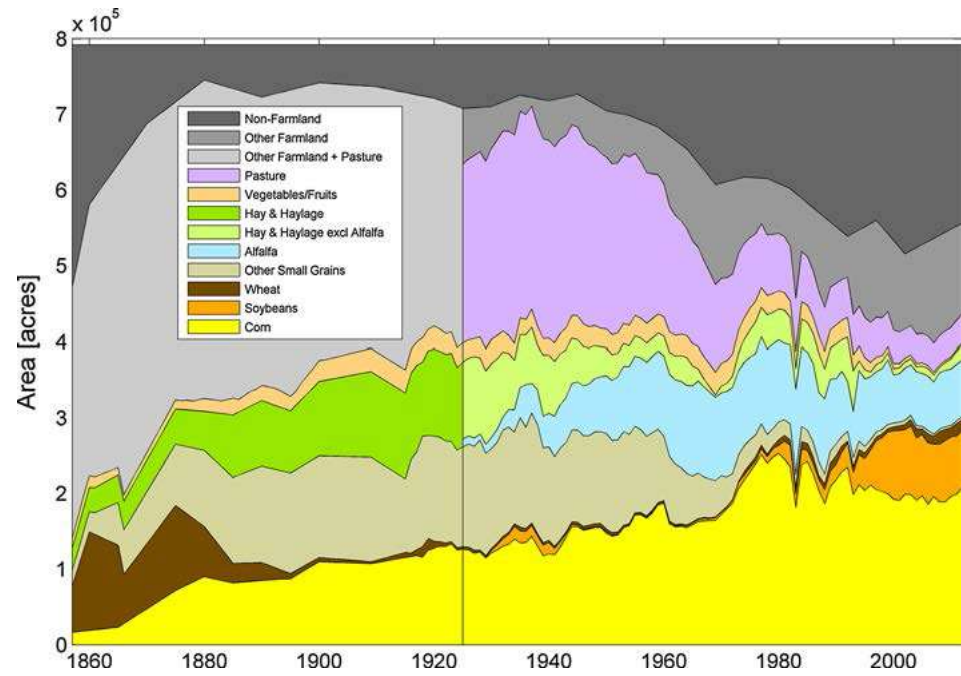
Nitrate

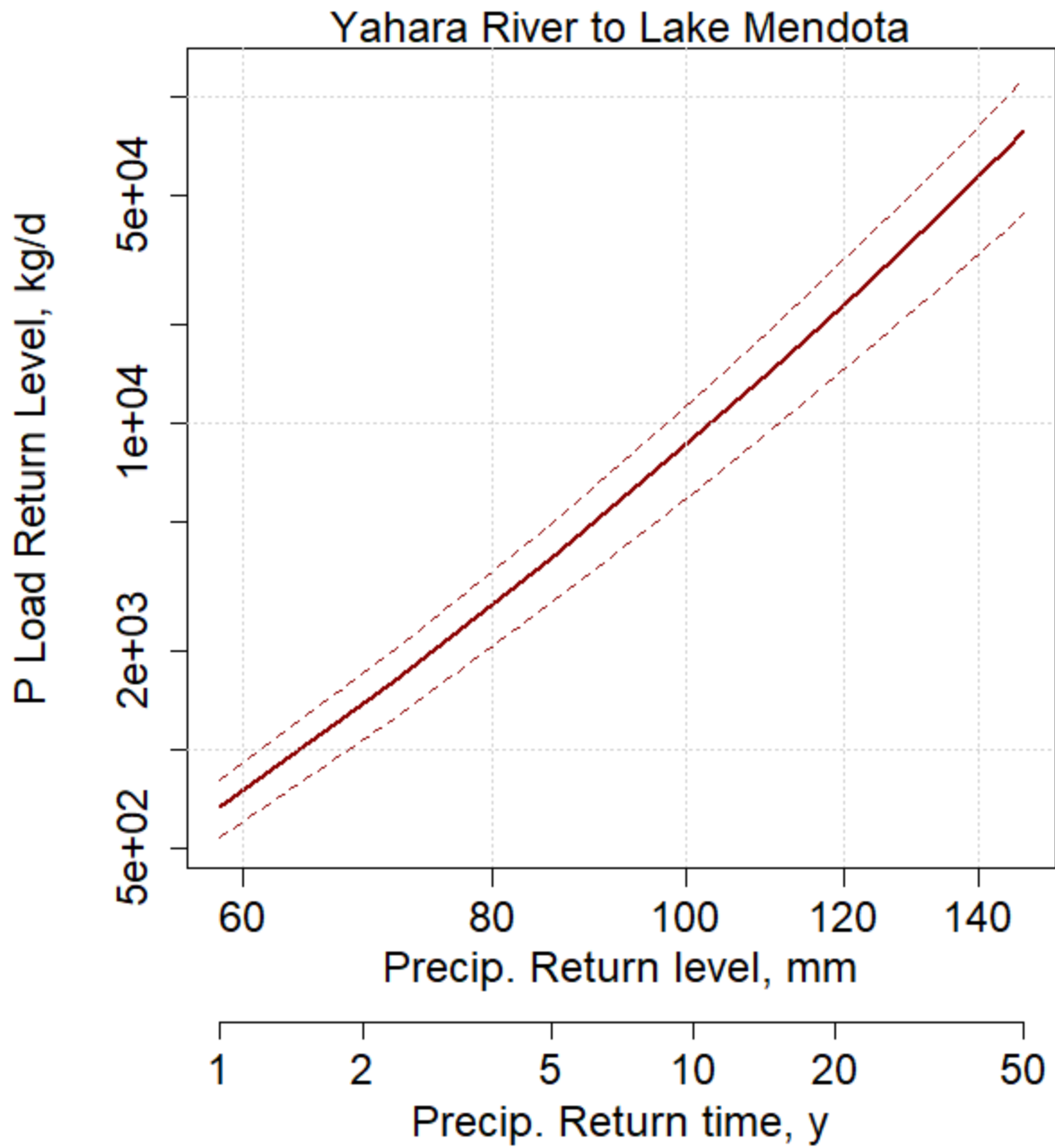
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East of Capital Square: August 2018 Flood Versus Scenario

