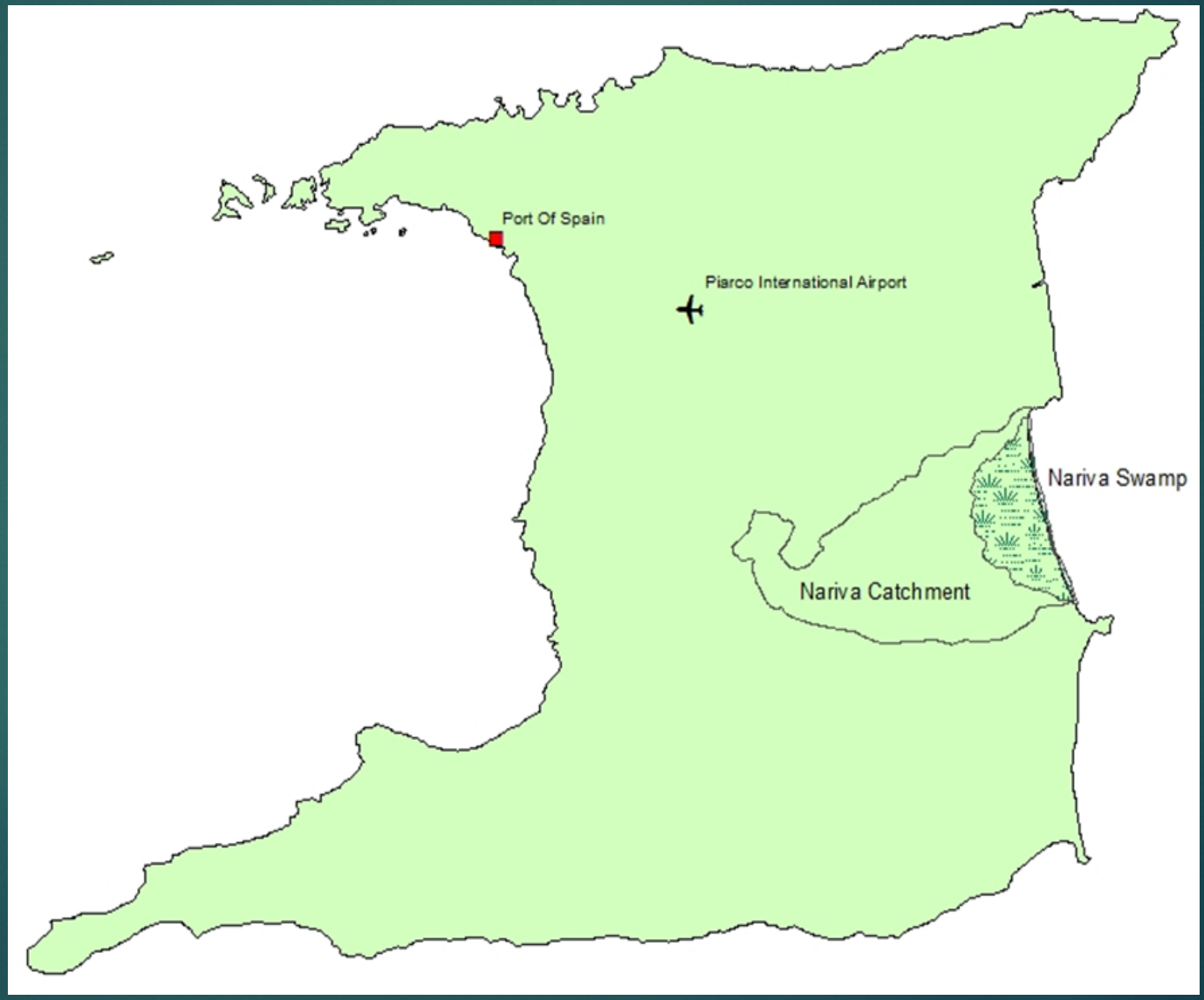
Catchment modelling and the assessment of the impact of climate change on water availability in the Nariva River, Trinidad

PRESENTER: CRYSTAL DASENT

Objectives

- Characterize the present use and availability of water within the Nariva catchment.
- Develop an outline model that represents water use within the Nariva catchment.
- Assess the effect of climate change on water availability in the catchment over two projected time periods (2035-2045 and 2065-2075).

Background


Port Of Spain
Piarco International Airport
Nariva Swamp
Nariva Catchment

Catchment Characteristics

- Located on the east coast of the island
- Has the largest freshwater wetland on the island
- Catchment drains into the Atlantic Ocean
- Two protected areas; Bush Bush Wildlife Sanctuary and Nariva Mayaro Windbelt Forest Reserve

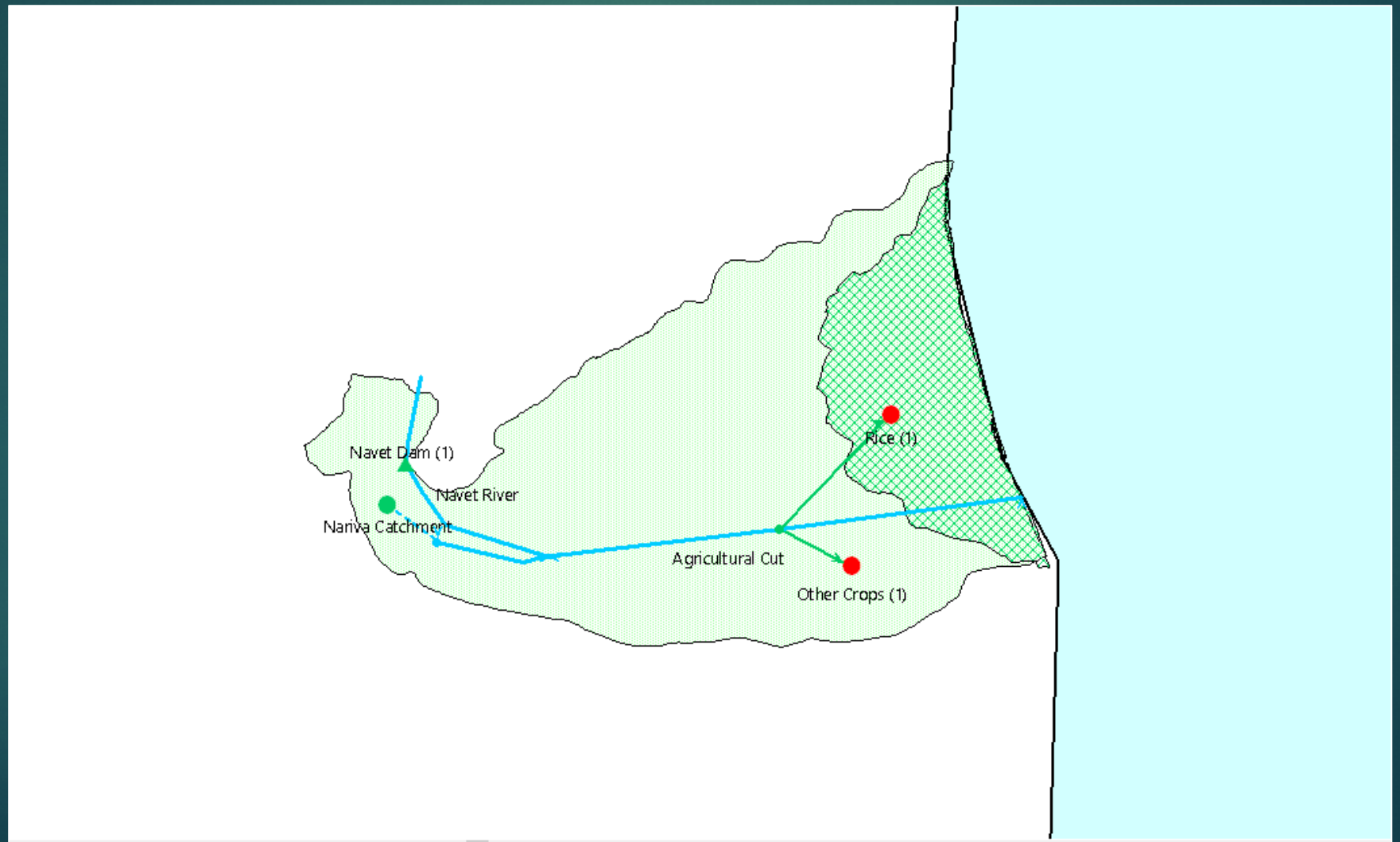
Cont'd

- Primary water user is agriculture
- Navet Dam which provides water for domestic use in Central and South Trinidad
- Some domestic water use by small rural settlements
- Projections:

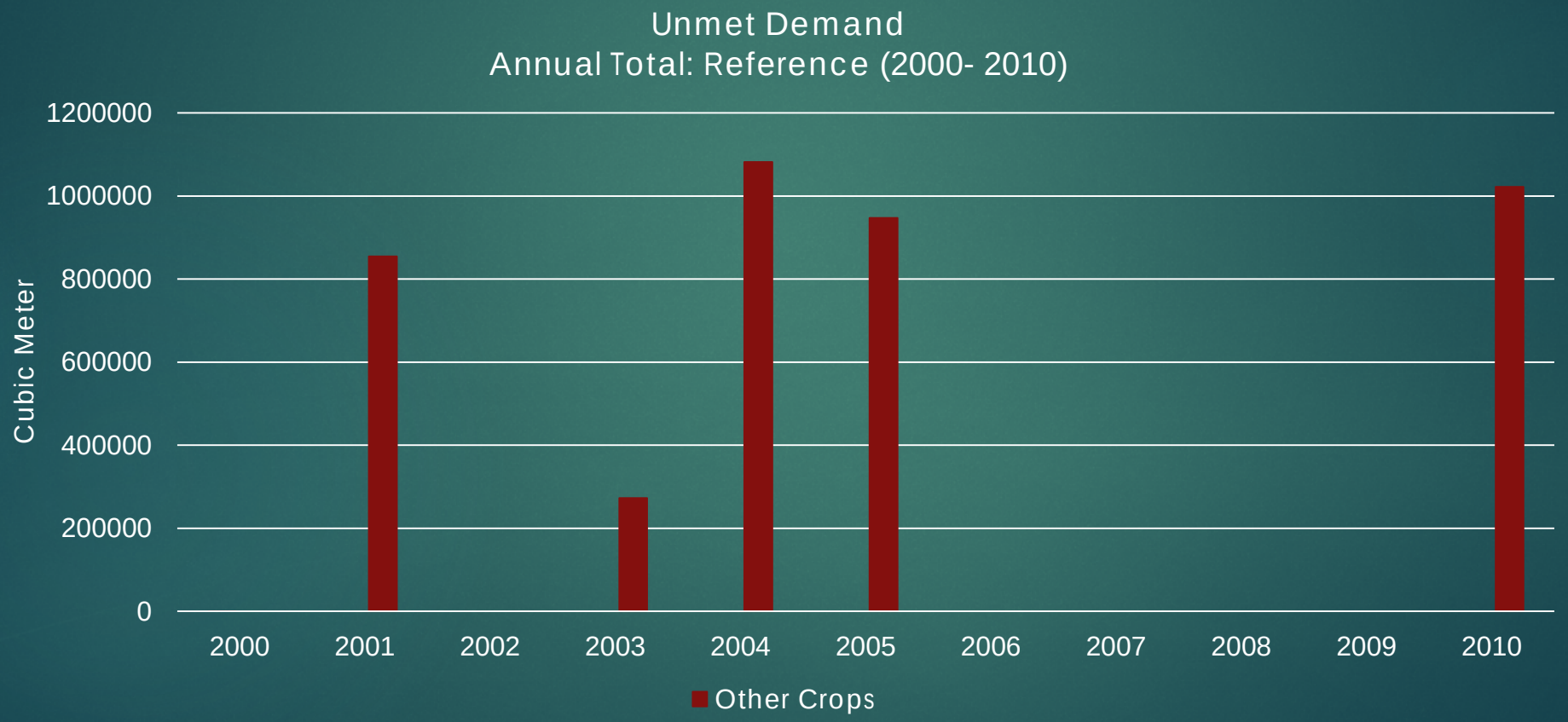
  18.5% decrease in Near Term (2035-2045)

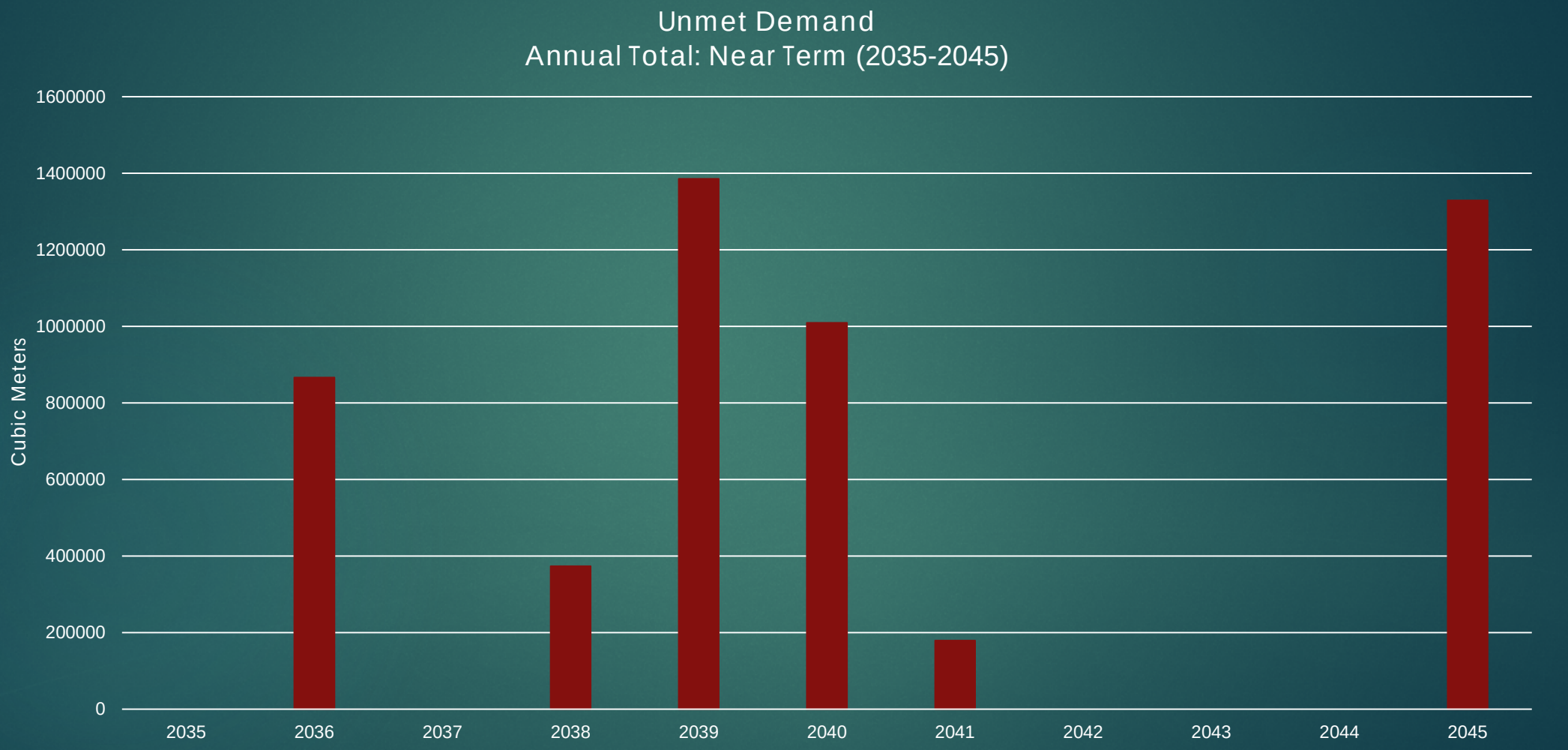
  39.6% decrease in Long Term (2065-2075)

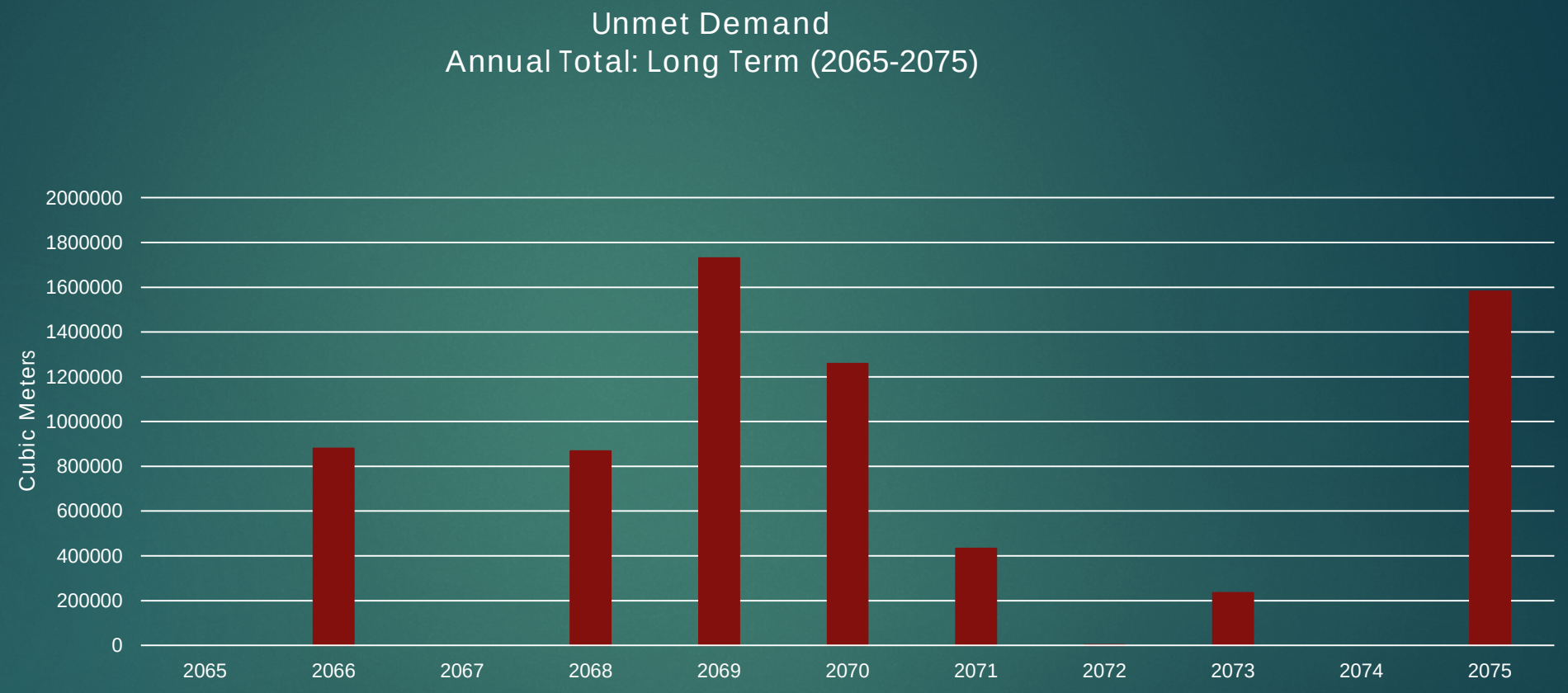
Schematic View of Nariva Catchment in WEAP

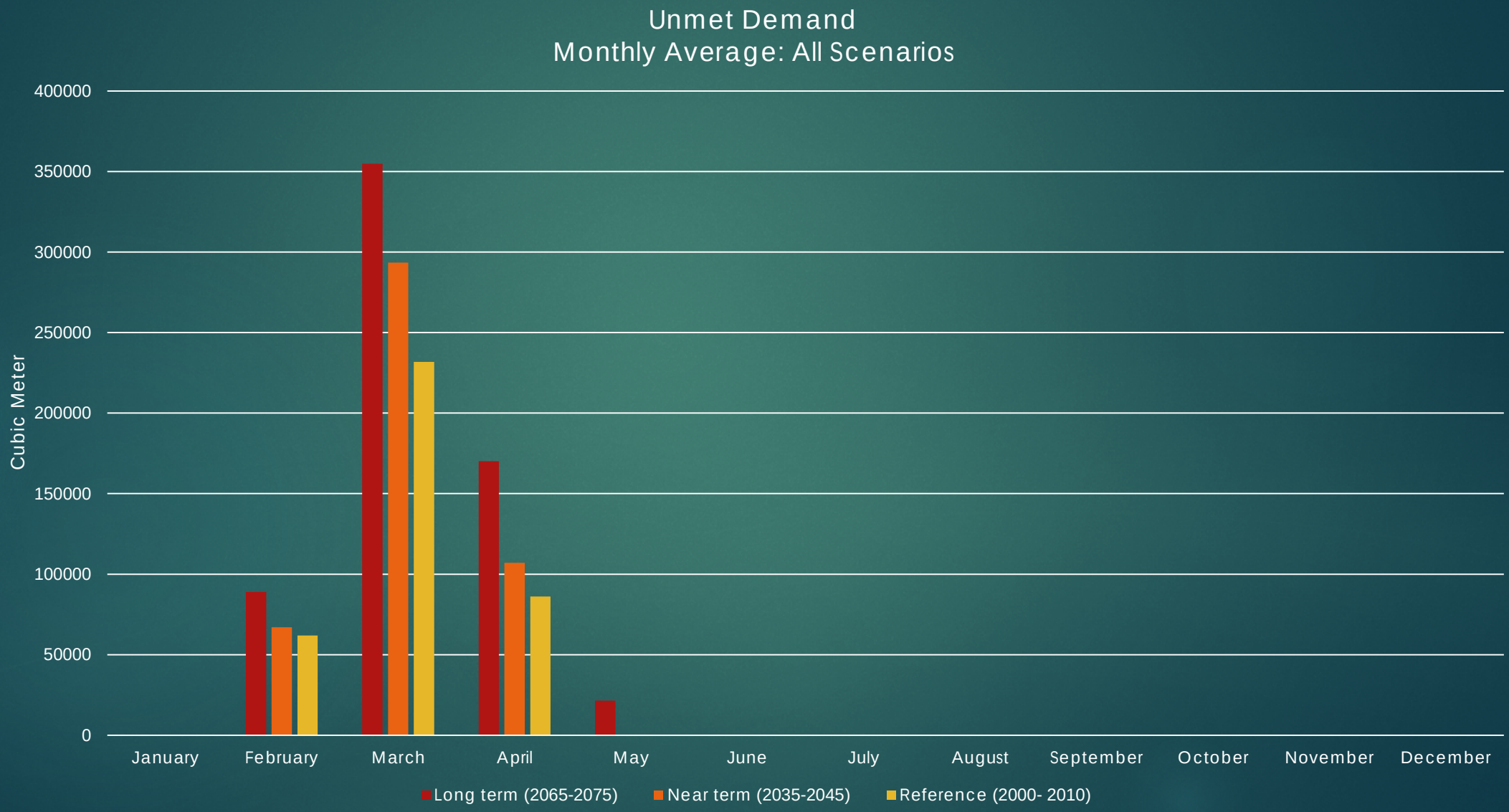


Results


Unmet Demand
Annual Total: Reference (2000- 2010)
Cubic Meter
1200000
1000000
800000
600000
400000
200000
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Other Crops


Unmet Demand
Annual Total: Near Term (2035-2045)
Cubic Meters
1600000
1400000
1200000
1000000
800000
600000
400000
200000
0
2035
2036
2037
2038
2039
2040
2041
2042
2043
2044
2045


Unmet Demand
Annual Total: Long Term (2065-2075)
Cubic Meters
2000000
1800000
1600000
1400000
1200000
1000000
800000
600000
400000
200000
0
2065
2066
2067
2068
2069
2070
2071
2072
2073
2074
2075


Unmet Demand
Monthly Average: All Scenarios
Cubic Meter
400000
350000
300000
250000
200000
150000
100000
50000
0
January
February
March
April
May
June
July
August
September
October
November
December
Long term (2065-2075)
Near term (2035-2045)
Reference (2000- 2010)

Assumptions

- Demand was constant in all scenarios
- Area of land under cultivation also remained the same for all years
- Precipitation declines by a fixed amount each year

Limitations

- Data availability
- Precipitation was the only variable that was changed
- Model requires data that many SIDS do not have e.g. effective precipitation and crop coefficients

Recommendations

- Demand studies
- Up-to-date hydrological and agricultural data
- Can be used by decision-makers to inform demand management strategies

References

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Any Questions?