

10 year Drought of Record Flow Regime Development in support of HDR Engineering Solutions Evaluation

March 2010



IMPORTANT

- *NOT A REPLACEMENT for the Science Subcommittee J Charge Flow recommendations for the survival and recovery of the threatened and endangered species.*
- *All numbers are DRAFT and will change.*

10 year - Drought of Record (DOR) Flow Regime GOAL

- ***SURVIVAL of the threatened and endangered species in the wild.***
 - *Conditions will be far less than optimal for extended periods of time.*
- ***Primary use will be to calculate the amount of storage needed via various engineering solutions being evaluated by HDR.***

10 year DOR Flow Regime

MAJOR ASSUMPTIONS

- *RECOVERY of the threatened and endangered species in the wild is possible when flows return to “out of drought of record” conditions.*
- *Water quality of the spring flow will have the same chemistry and biological components as Edwards Aquifer water.*

10 year – DOR Flow Regime

MAJOR ASSUMPTIONS

- *Mitigation activities will take care of exotic plant and animal species including the gill parasite.*
- *Recreational impacts to species will be addressed and managed to limit impact.*
- *Intensive Management Areas (IMAs) are in place on both the Comal and San Marcos systems.*
- *Flow split between the new and old channels at Comal will be part of the management strategy.*

10 year – DOR Flow Regime

MAJOR ASSUMPTIONS

- *Focus is placed on surface dwelling species (fountain darter, Comal Springs riffle beetle, Texas wild-rice, and San Marcos salamander).*
- *Edwards Aquifer water quality will be maintained by the minimum monthly springflows at Comal and San Marcos, and thus subterranean species will be protected.*

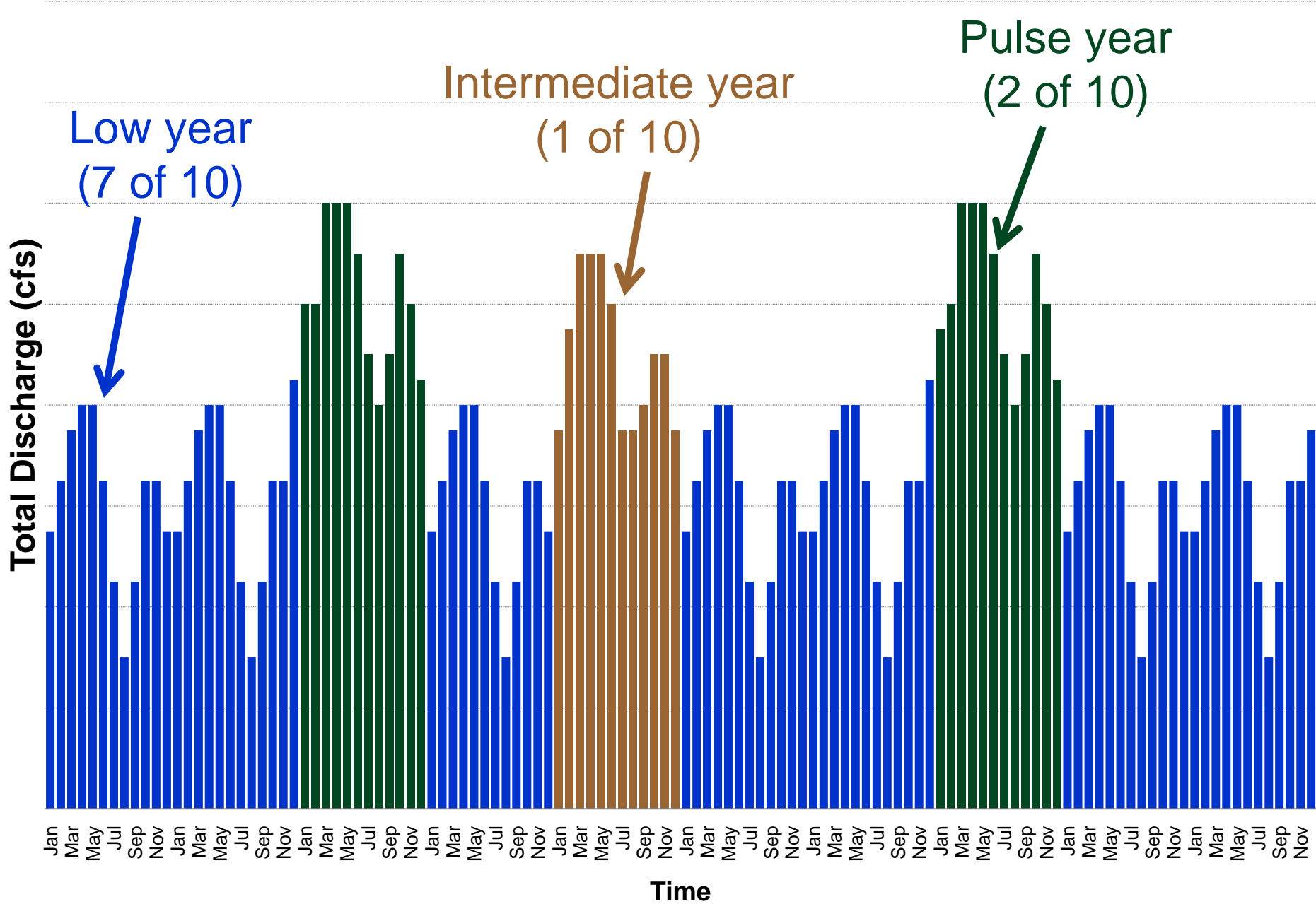
Keys for Survival - Comal

- *Fountain darter*
 - *Maintain quality habitat through a portion of Landa Lake and old channel at all times.*
 - *Maintain quality habitat in the New Channel most of the time.*
 - *Maintain seasonal (Spring) reproduction in Landa Lake, old channel and new channel on an annual basis.*
 - *Maintain year round reproduction in Landa Lake and old channel during intermediate and pulse years.*
 - *IMA operating during summer time months of low flow years.*

Keys for Survival - Comal

- *Comal Springs Riffle Beetle*
 - *Maintain quality habitat through a portion of Landa Lake, Spring Island area, and western shoreline at all times.*
 - *Maintain quality habitat in Spring run 3 most of the time.*
 - *IMA operating in Spring run 3 during summer time months of low flow years.*

10 year (DOR) Flow Regime - Comal System



Keys for Survival –San Marcos

- *Fountain darter*
 - *Maintain quality habitat through a portion Spring Lake and subsequent river channel above I35 at all times.*
 - *Maintain quality habitat in the full longitudinal extent of darter occupied habitat most of the time.*
 - *Maintain seasonal (Spring) reproduction in Spring Lake and entire river channel annually.*
 - *Maintain year round reproduction in Spring Lake and eastern spillway IMA during most years.*

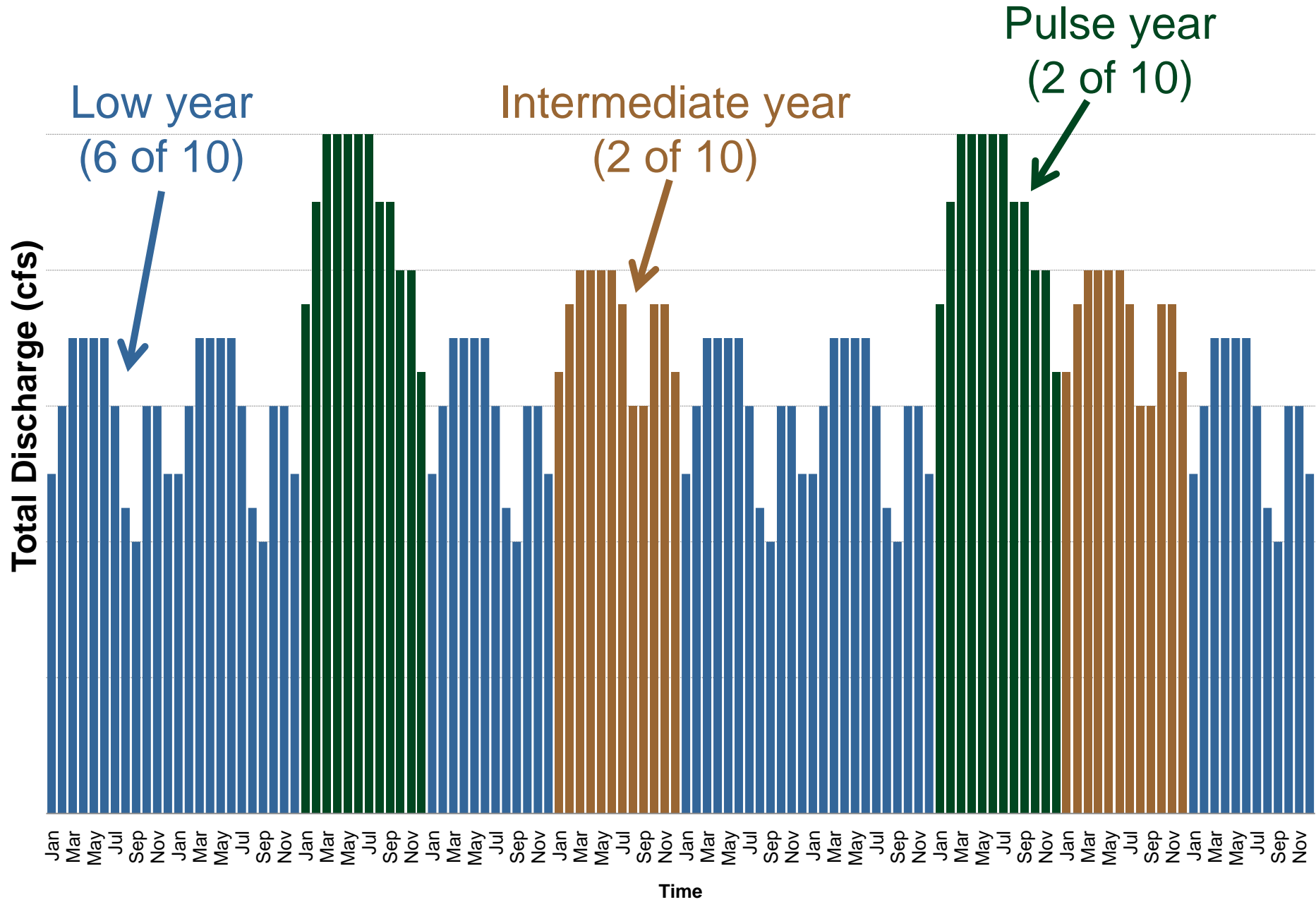
Keys for Survival – San Marcos

- *Texas wild-rice*
 - *Maintain some quality habitat in river channel down to I35.*
 - *Establish an IMA in the eastern spillway below Spring Lake Dam and maintain high quality habitat in this area at all times.*
 - *Establish IMAs longitudinally down the San Marcos river to provide deeper flowing areas during low flow years.*
 - *Recreation not to cause any effects in designated IMA protection areas.*

Keys for Survival –San Marcos

- *San Marcos salamander*
 - *Maintain quality habitat through a portion Spring Lake and subsequent river channel to University Drive at all times.*
 - *Maintain seasonal (Spring) reproduction in Spring Lake and subsequent river channel to University Drive at all times.*
 - *Establish an IMA in the eastern spillway below Spring Lake Dam and maintain high quality habitat in this area at all times.*
 - *Maintain year round reproduction in Spring Lake and eastern spillway IMA during most years.*

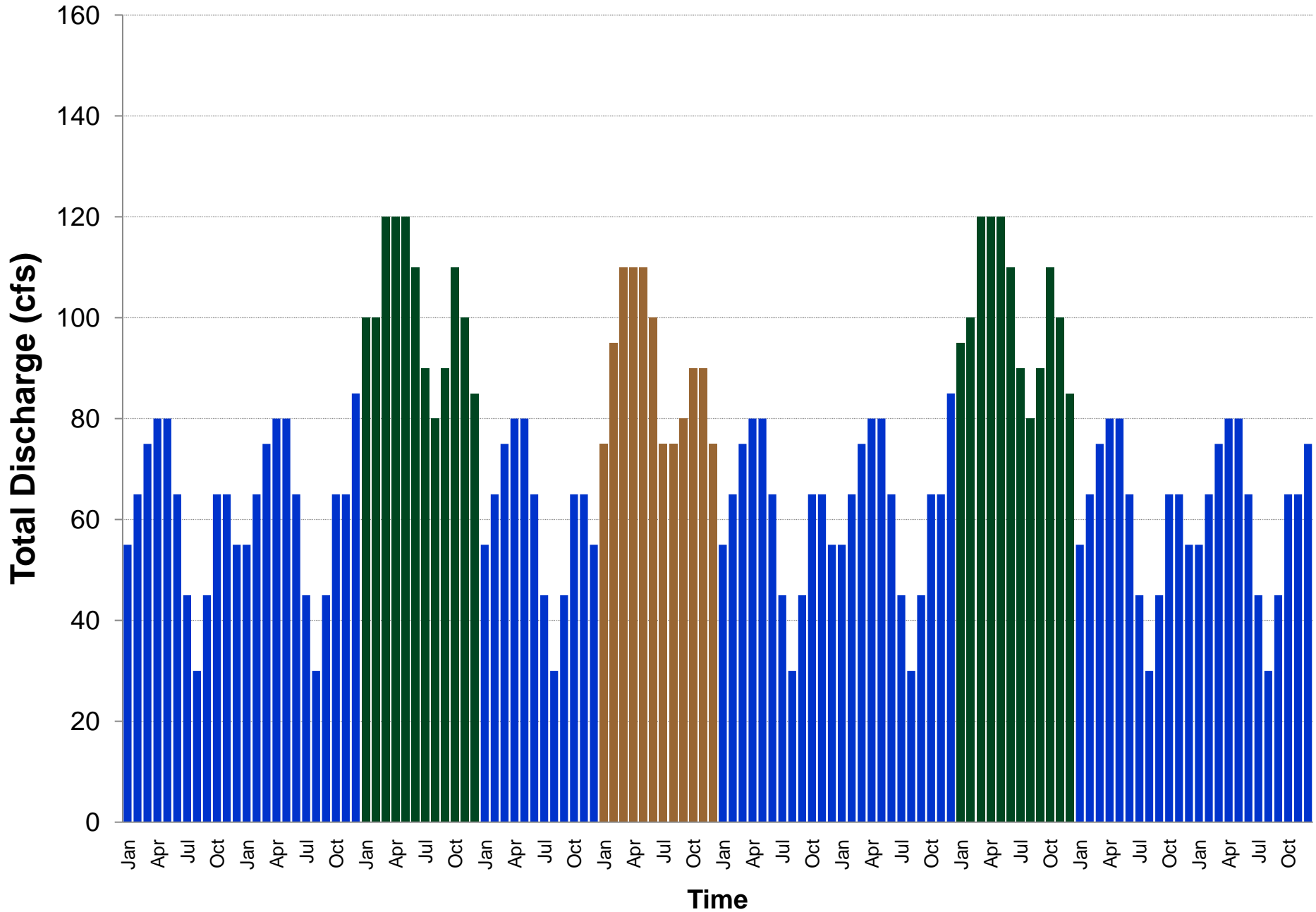
10 year (DOR) Flow Regime - San Marcos System



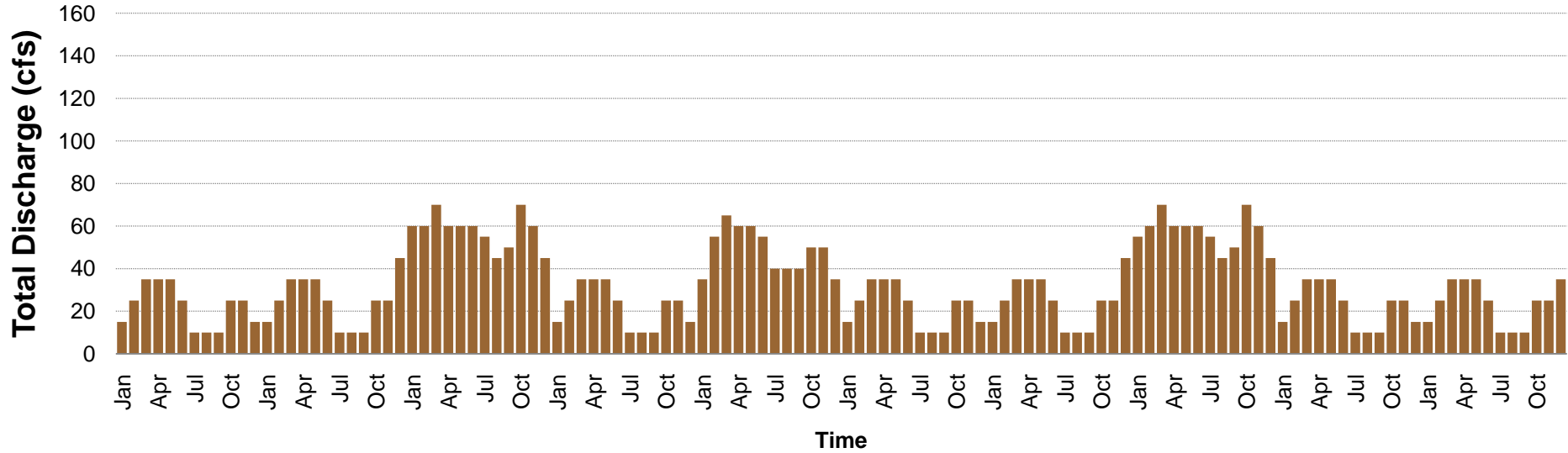
IMPORTANT – TAKE TWO

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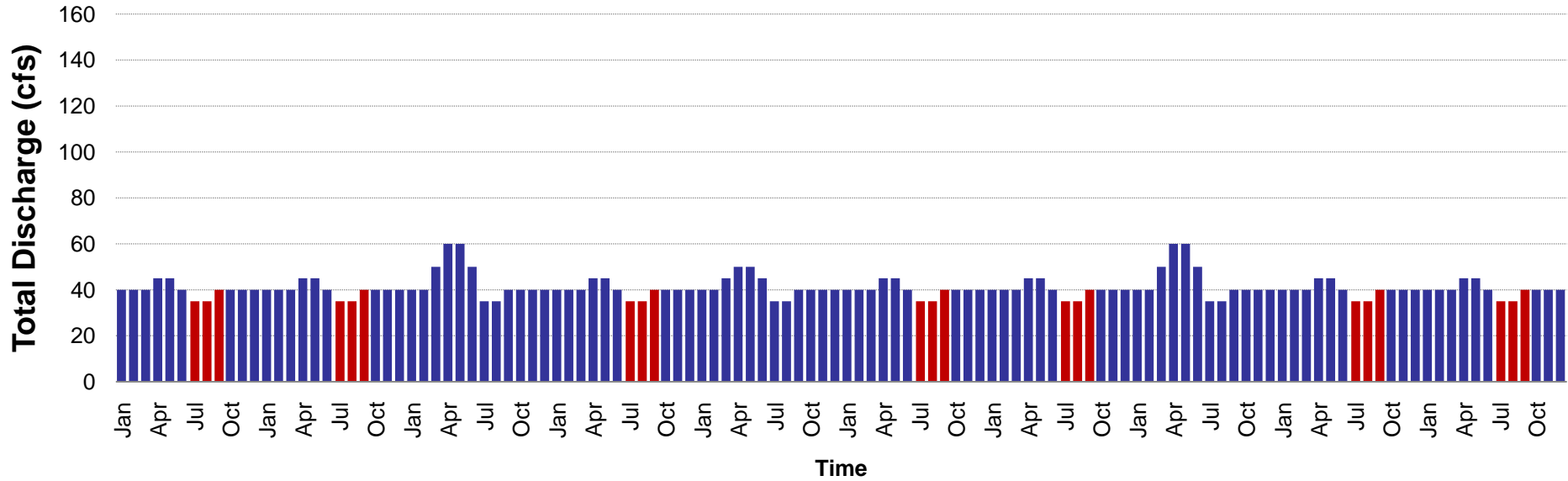
10 year (DOR) Flow Regime - Comal System



10 year (DOR) Flow Regime - Comal System New Channel

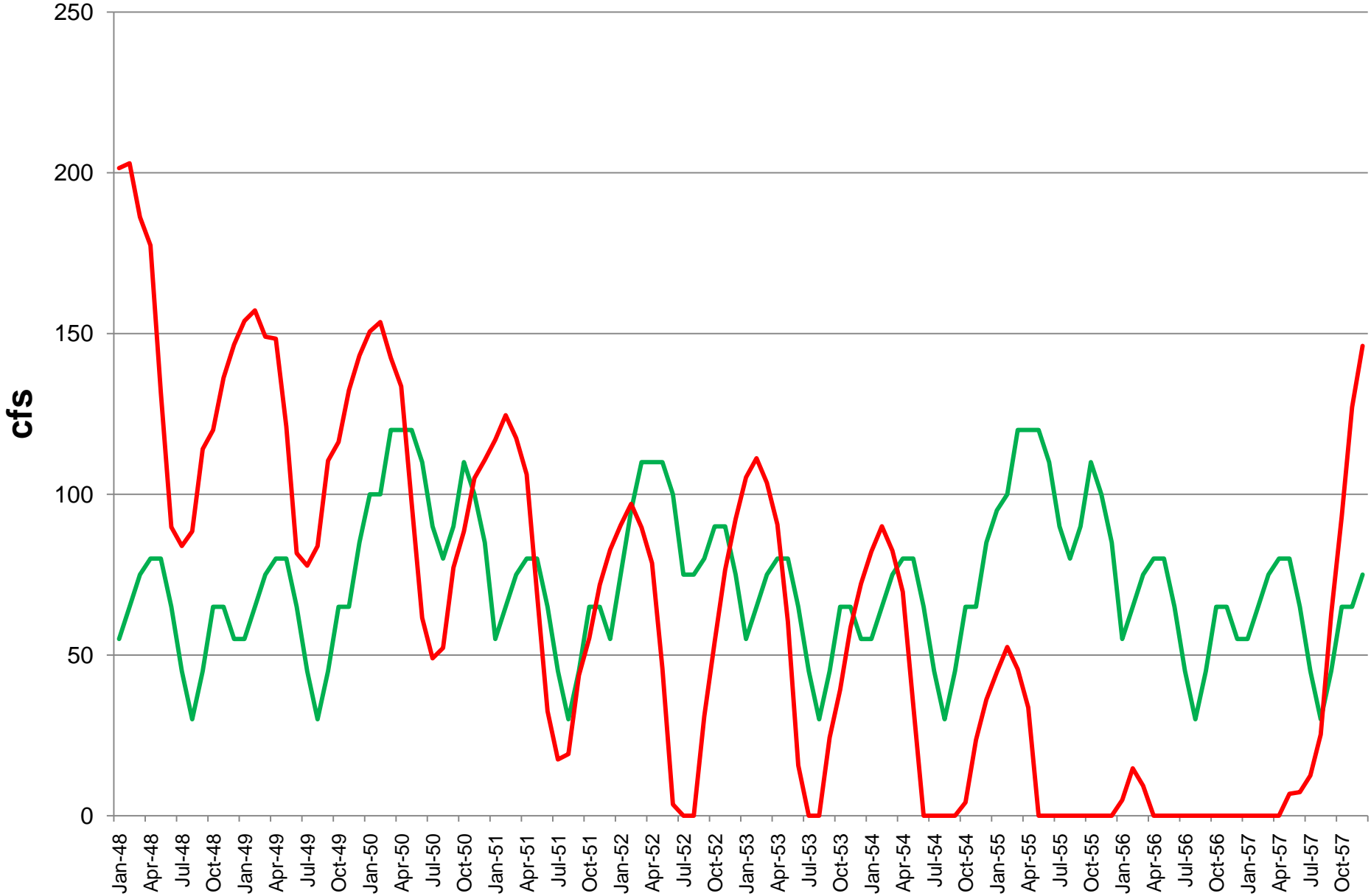


10 year (DOR) Flow Regime - Comal System Old Channel



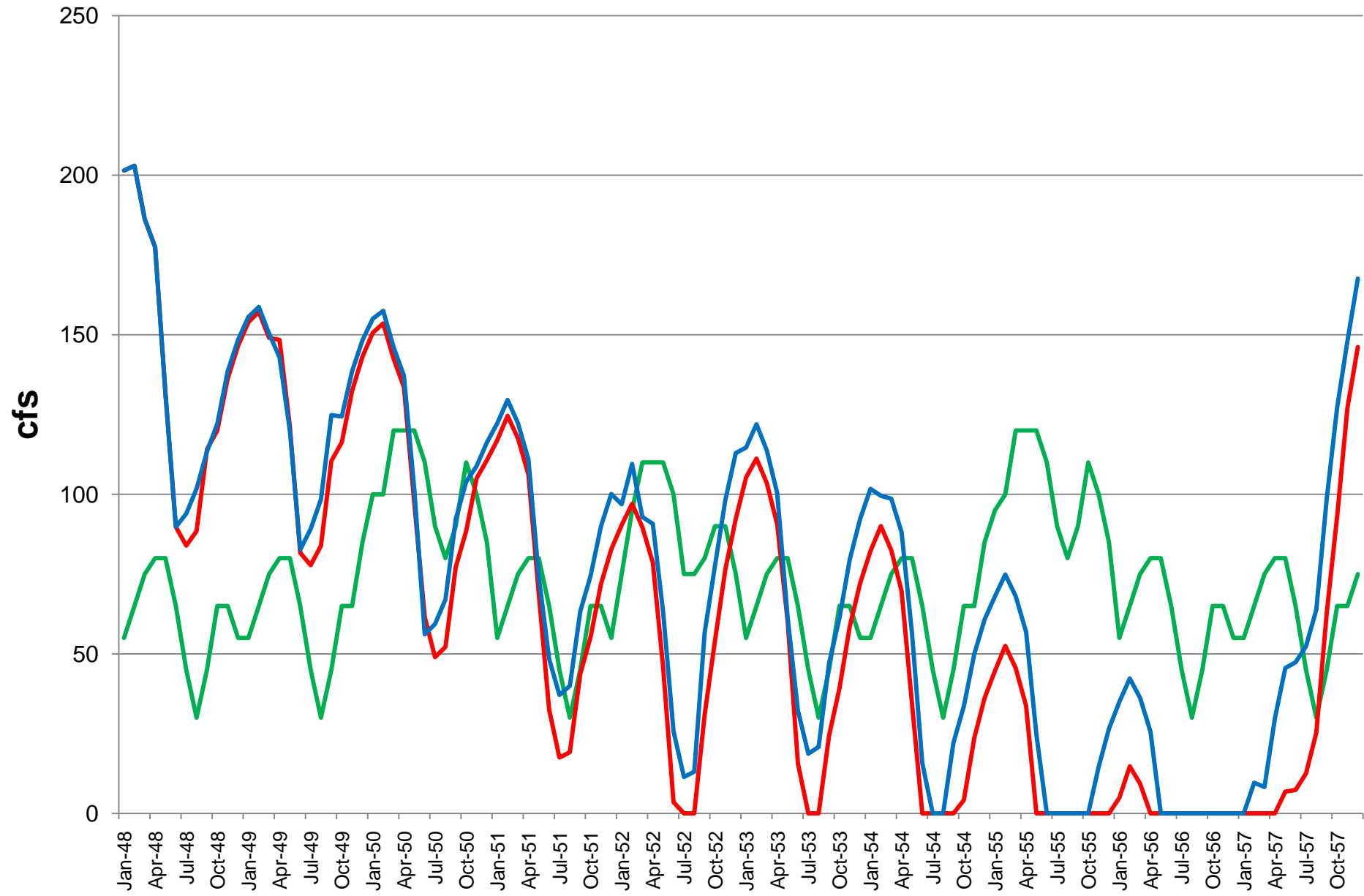
Comal Springs - Modeled DOR (1948-1957)

— DOR Regime — SB3-340



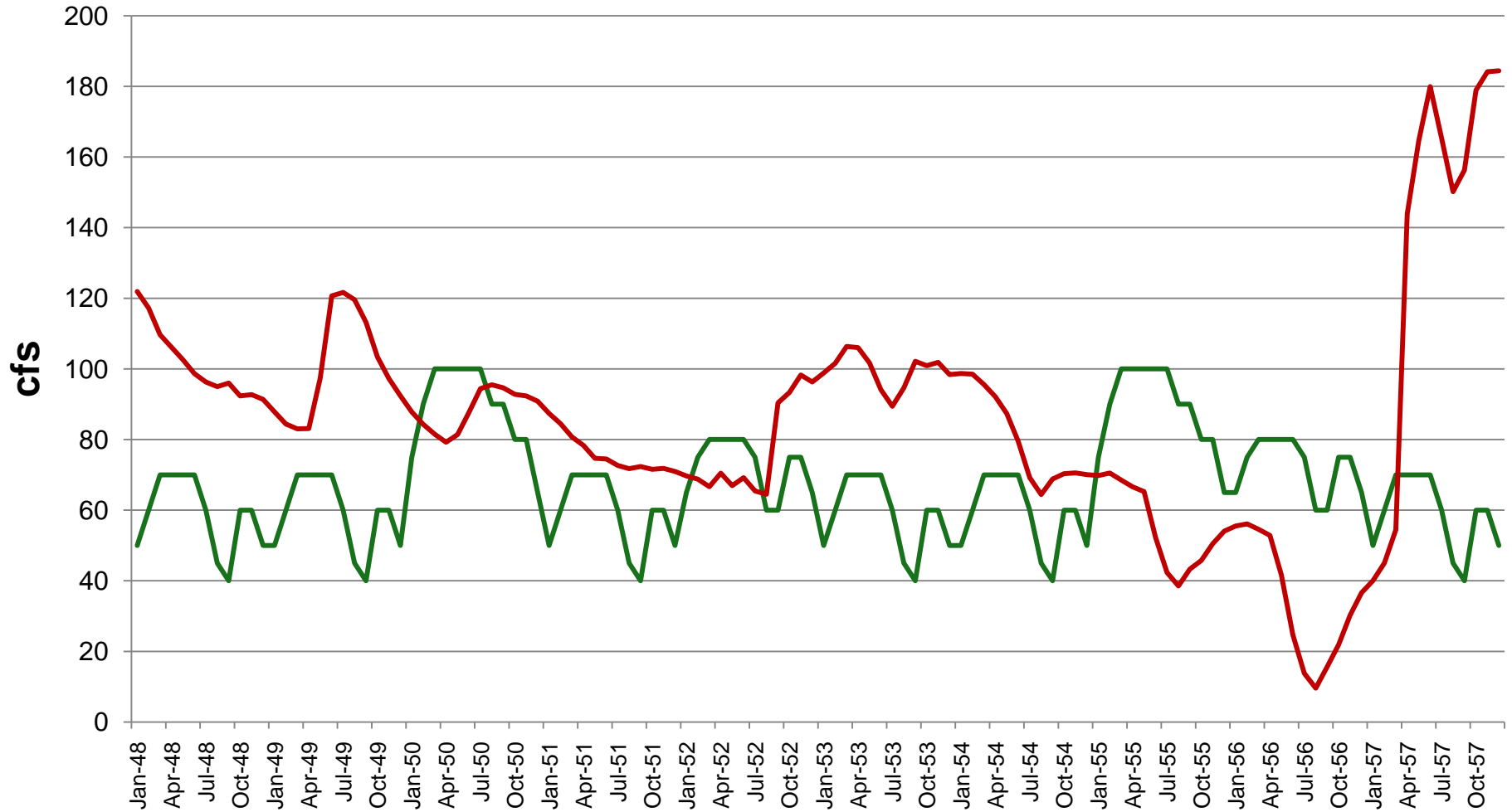
Comal Springs - Modeled DOR (1948-1957)

DOR Regime SB3-340 SB3-320



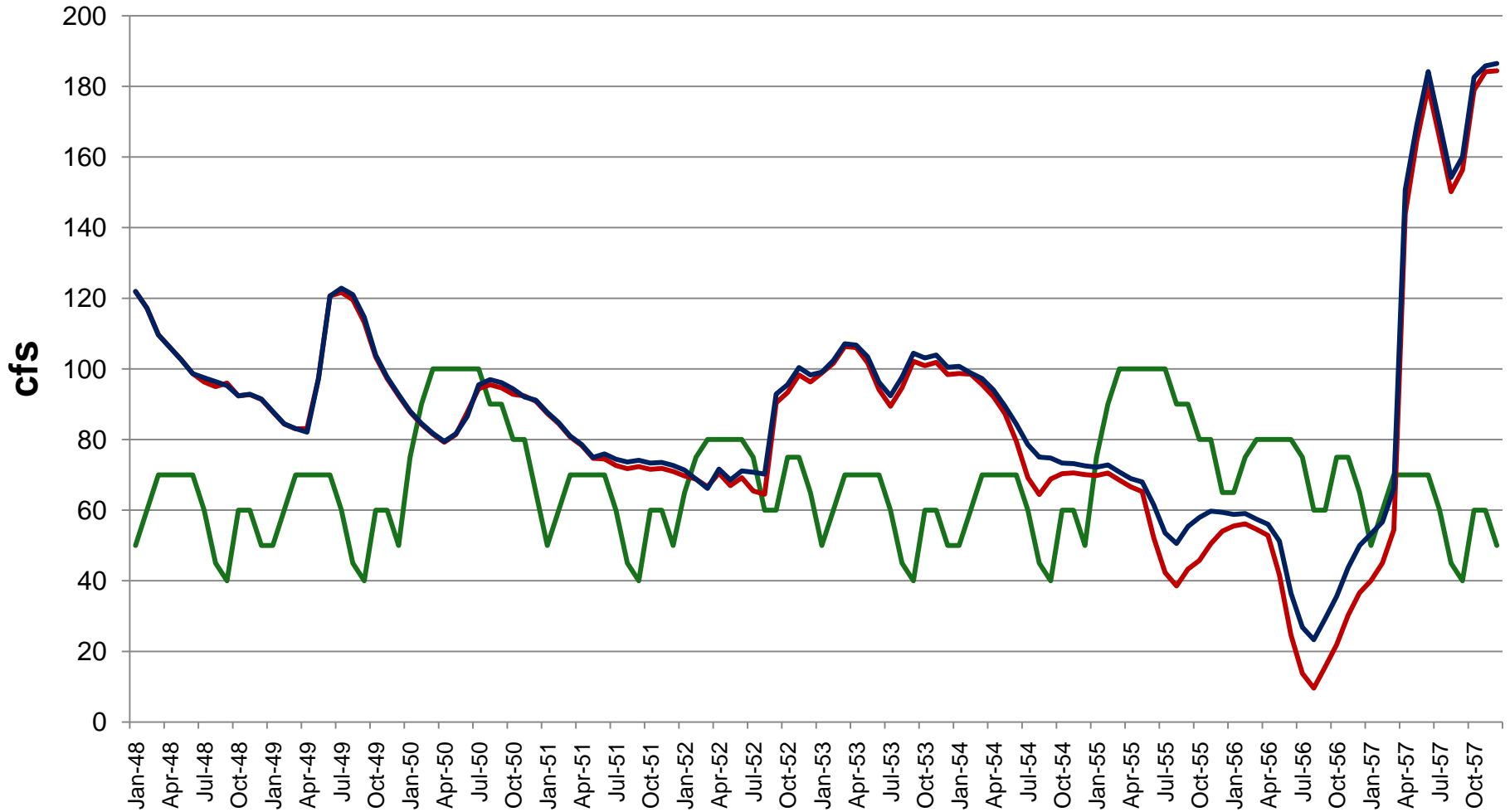
San Marcos Springs - Modeled DOR (1948-1957)

— DOR Regime — SB3-340



San Marcos Springs - Modeled DOR (1948-1957)

— DOR Regime — SB3-340 — SB3-320



Preliminary Rough Estimates of storage needs for Engineering Solutions

- *Comal Springs*
 - *SB3 / 340 : @ 208,000 acre-feet*
 - *SB3 / 320 : @ 152,000 acre-feet*
- *San Marcos Springs*
 - *SB3 / 340 : @ 62,000 acre-feet*
 - *SB3 / 320 : @ 48,000 acre-feet*

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THOUGHTS / QUESTIONS

