Trends in inflows to the Highland Lakes and implications for basin management and water planning

A Presentation To:

The Lower Colorado Regional Water Planning Group

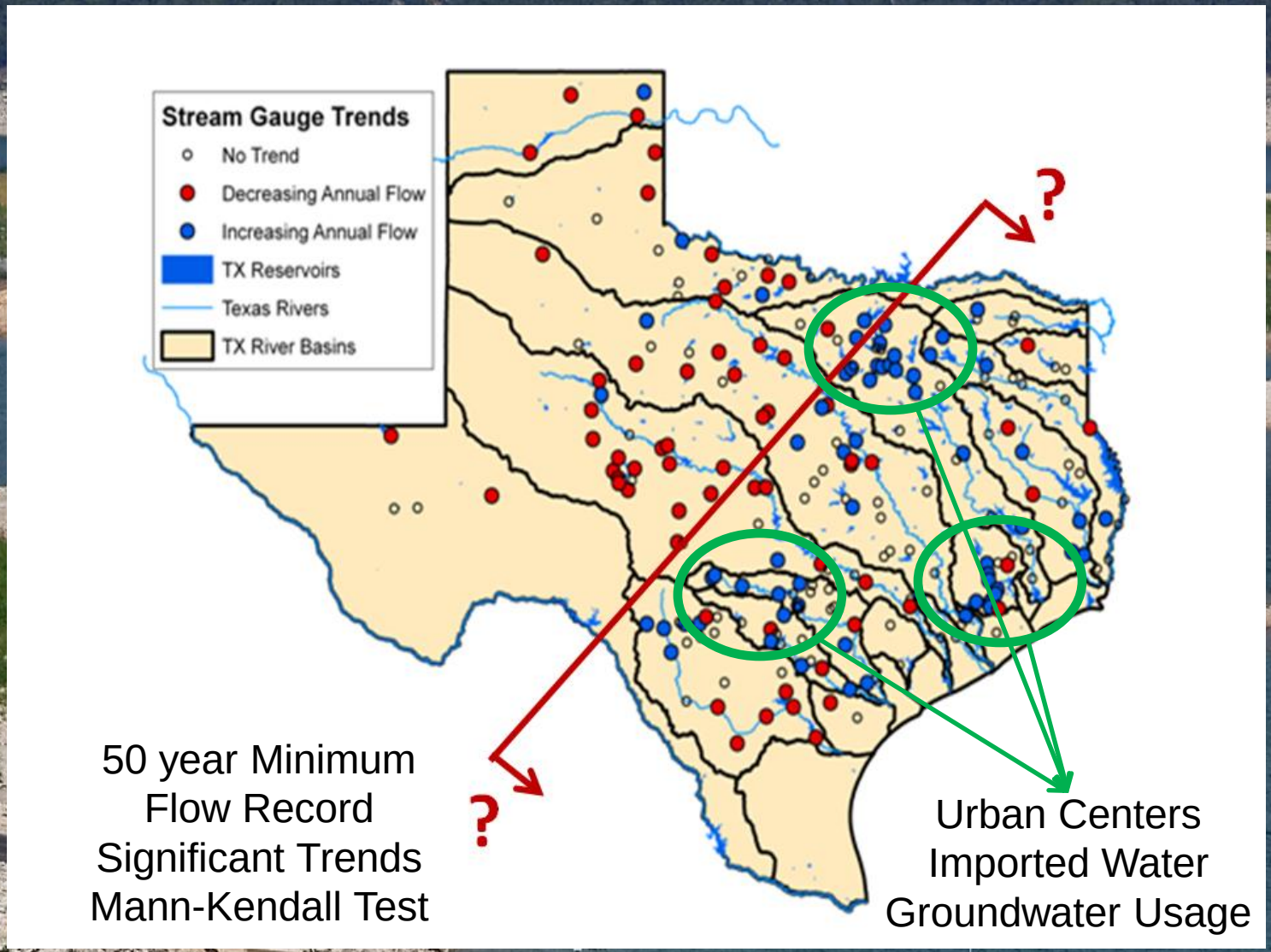
Presented By:

Central Texas Water Coalition

Hydrology:

INTERA Geosciences & Engineering

July 10, 2013



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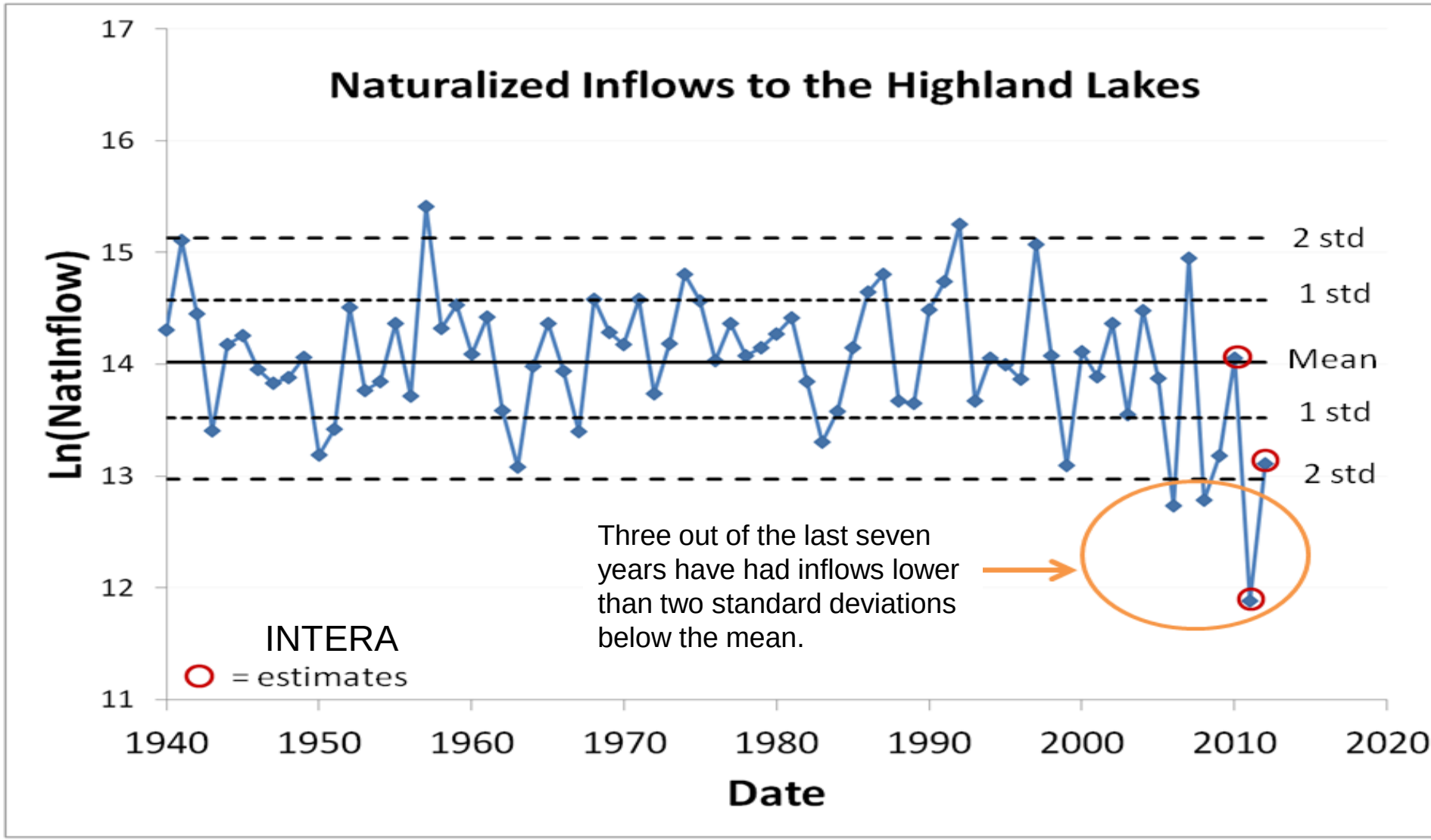
Naturalized Inflows to the Highland Lakes
Ln(NatInflow)
17
16
15
14
13
12
11
2 std
1 std
Mean
1 std
2 std
Three out of the last seven years have had inflows lower than two standard deviations below the mean.
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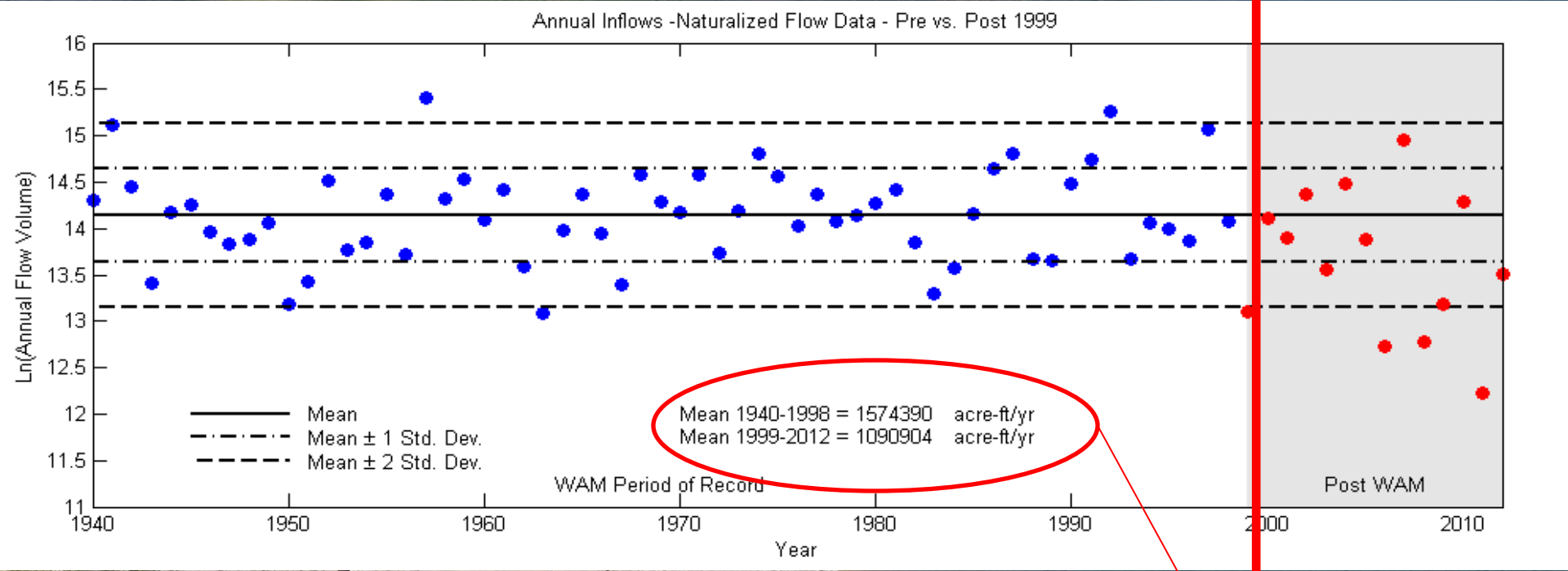
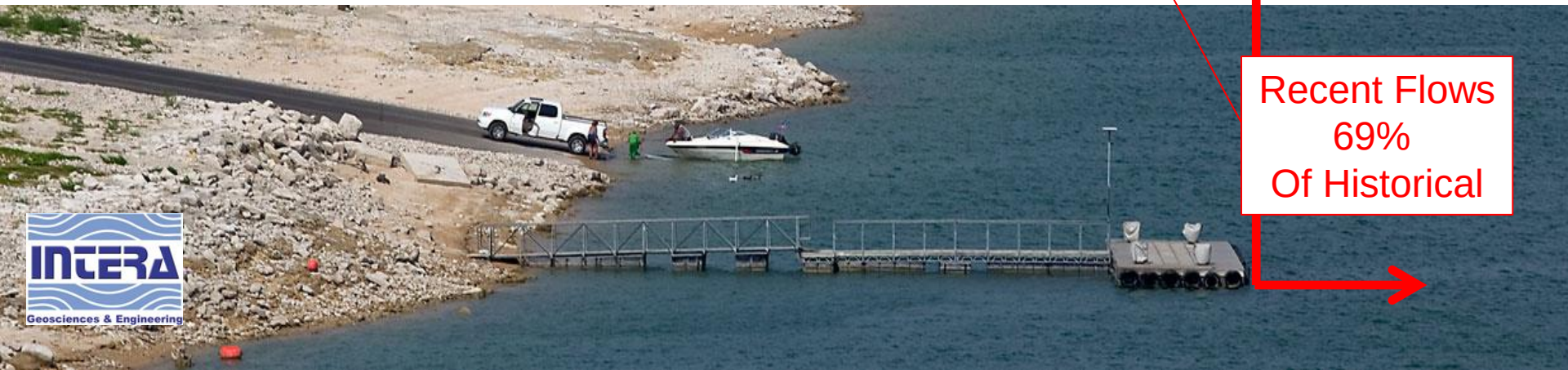
= estimates
1940
1950
1960
1970
1980
1990
2000
2010
2020
Date





Recent Flows
69%
Of Historical

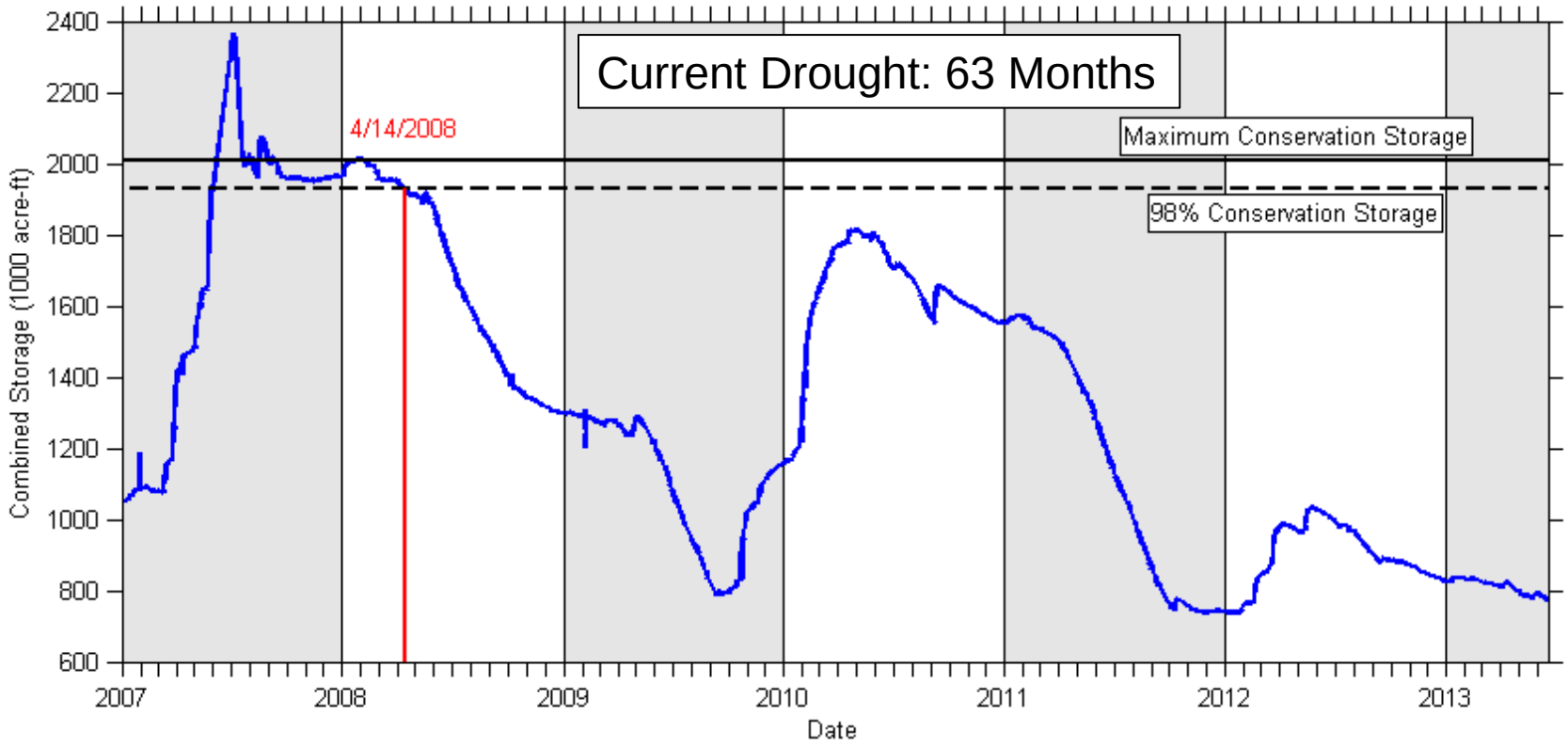
Is the current drought ***WORSE*** than the Drought of Record?

1. **Duration**:
   More than 24 months since lakes were full
2. **Intensity**:
   Inflows less than LCRA "Envelope Curve"
3. **Combined Storage**:
   Less than 600,000 acre-ft

Source: www.lcra.org_library_media_public_docs_water_wmp_TMs_A-1_thru_A-6_2012May

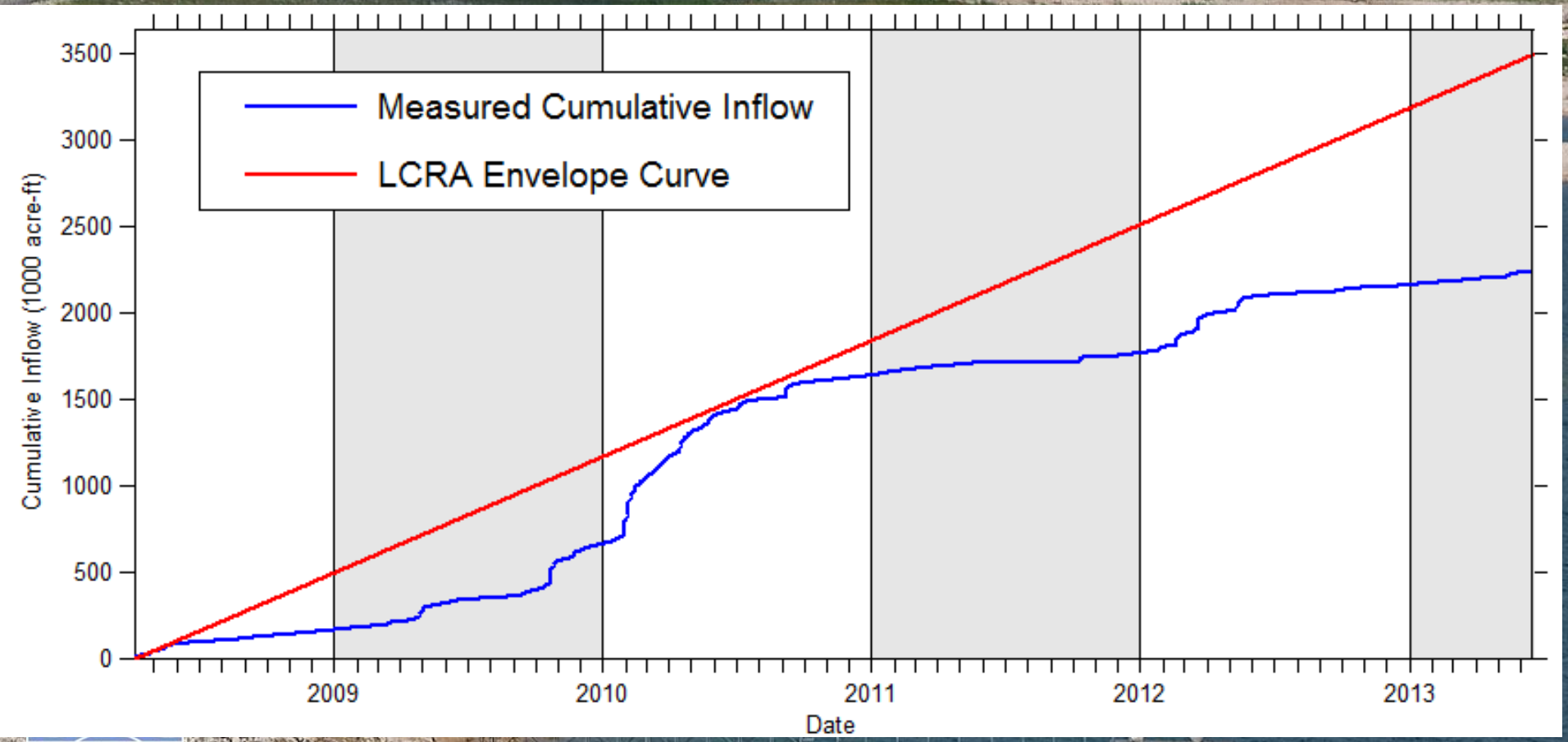
Criteria 1 - Duration:

More than 24 months since lakes were full



Criteria 2 - Intensity:

Inflows less than LCRA "Envelope Curve"



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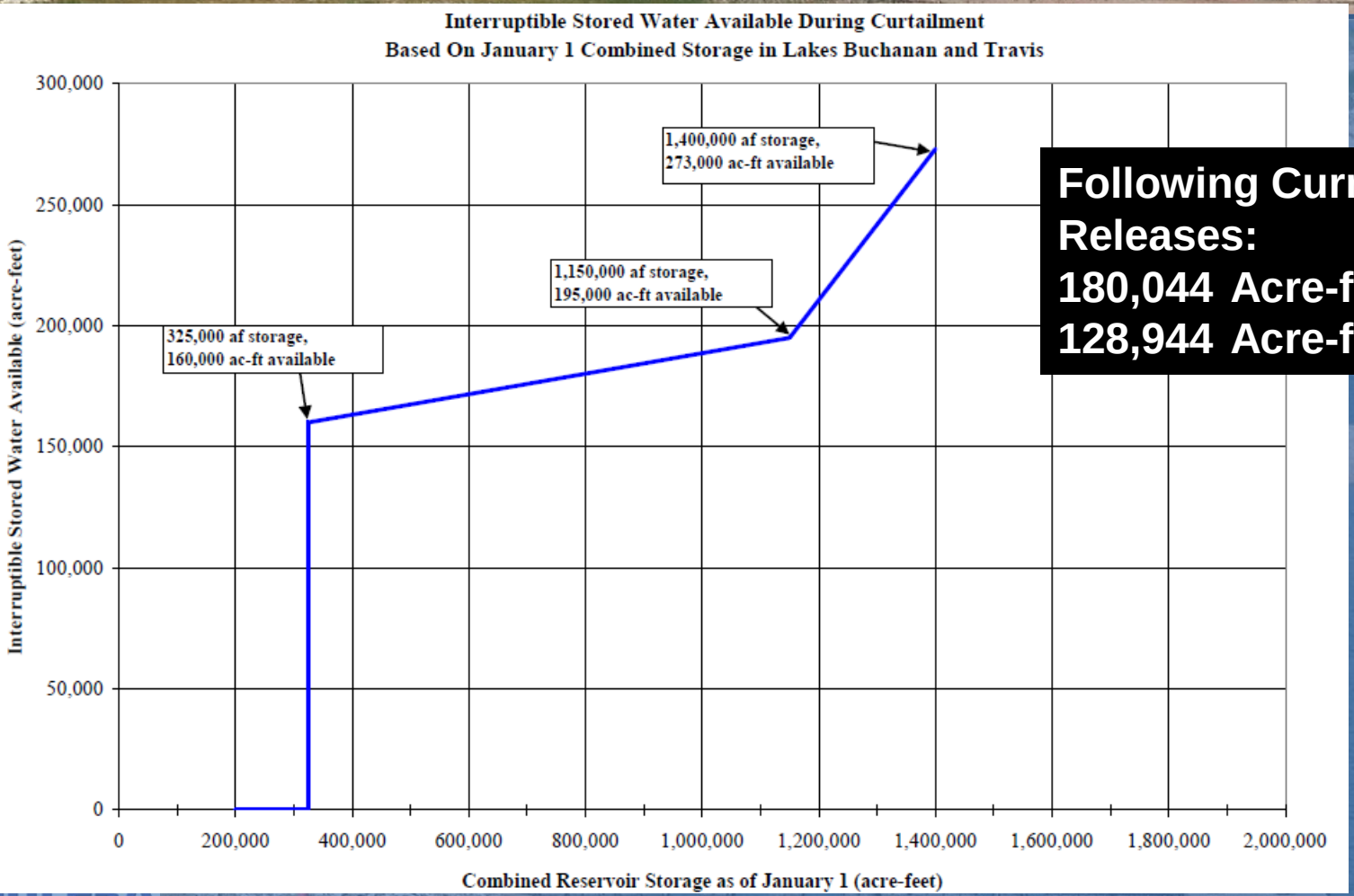
Is the current drought ***WORSE*** than the Drought of Record?

Criteria 3 - Combined Storage:
Less than 600,000 acre-ft

As of July 9 – Combined Storage = 726,000 acre-ft

What if Emergency Orders were not granted in 2012 & 2013?

Criteria 3 - Combined Storage:
Less than 600,000 acre-ft



Following Current WMP Releases:
180,044 Acre-ft 2012
128,944 Acre-ft 2013

Criteria 3 - Combined Storage:

Less than 600,000 acre-ft

	$Storage_{January\ 1,\ 2012}$		738,715	Acre-ft
+	$Storage\_Change_{January\ 1,\ 2012\ to\ January\ 1,\ 2013}$	+	86,285	Acre-ft
-	Interruptible Release	-	180,044	Acre-ft
	$Projected\_Storage_{January\ 1,\ 2013}$		644,956	Acre-ft
+	$Storage\_Change_{January\ 1,\ 2013\ to\ May\ 21,\ 2013}$	+	-42,633	Acre-ft
-	Interruptible 1st Crop Release	-	128,944	Acre-ft
	$Projected\_Storage_{May\ 21,\ 2013}$		473,379	Acre-ft

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CTWC Conclusions

- Highland Lake Inflows have Decreased
  - 1999-Present → 69% of Historical
- Current Drought → Worse than DOR
  - WMP Does not protect Highland Lakes
  - Firm Yield needs re-calculation

- Current planning methods should not assume future will mimic observed past


Thanks for your attention!
Questions?
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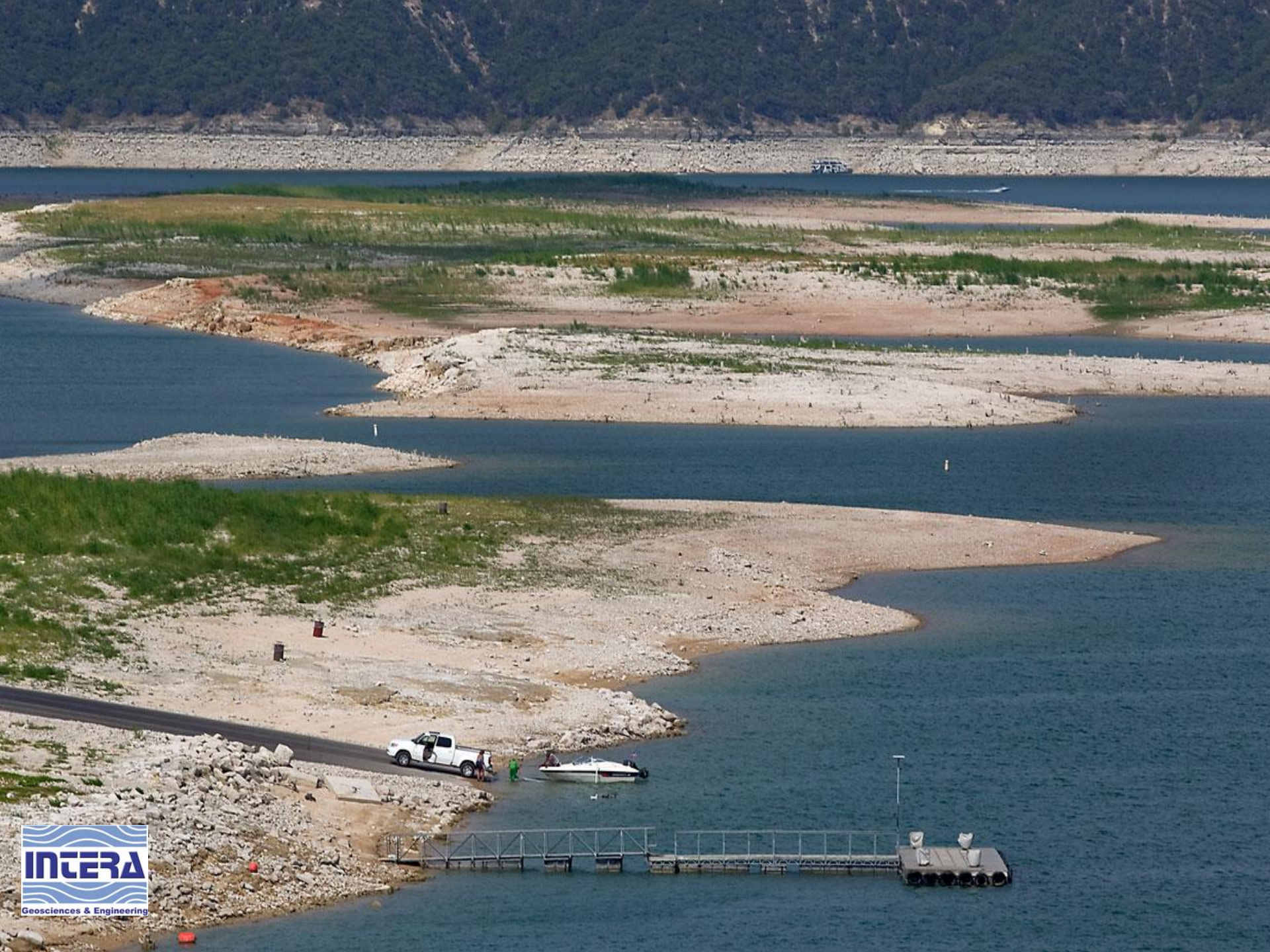
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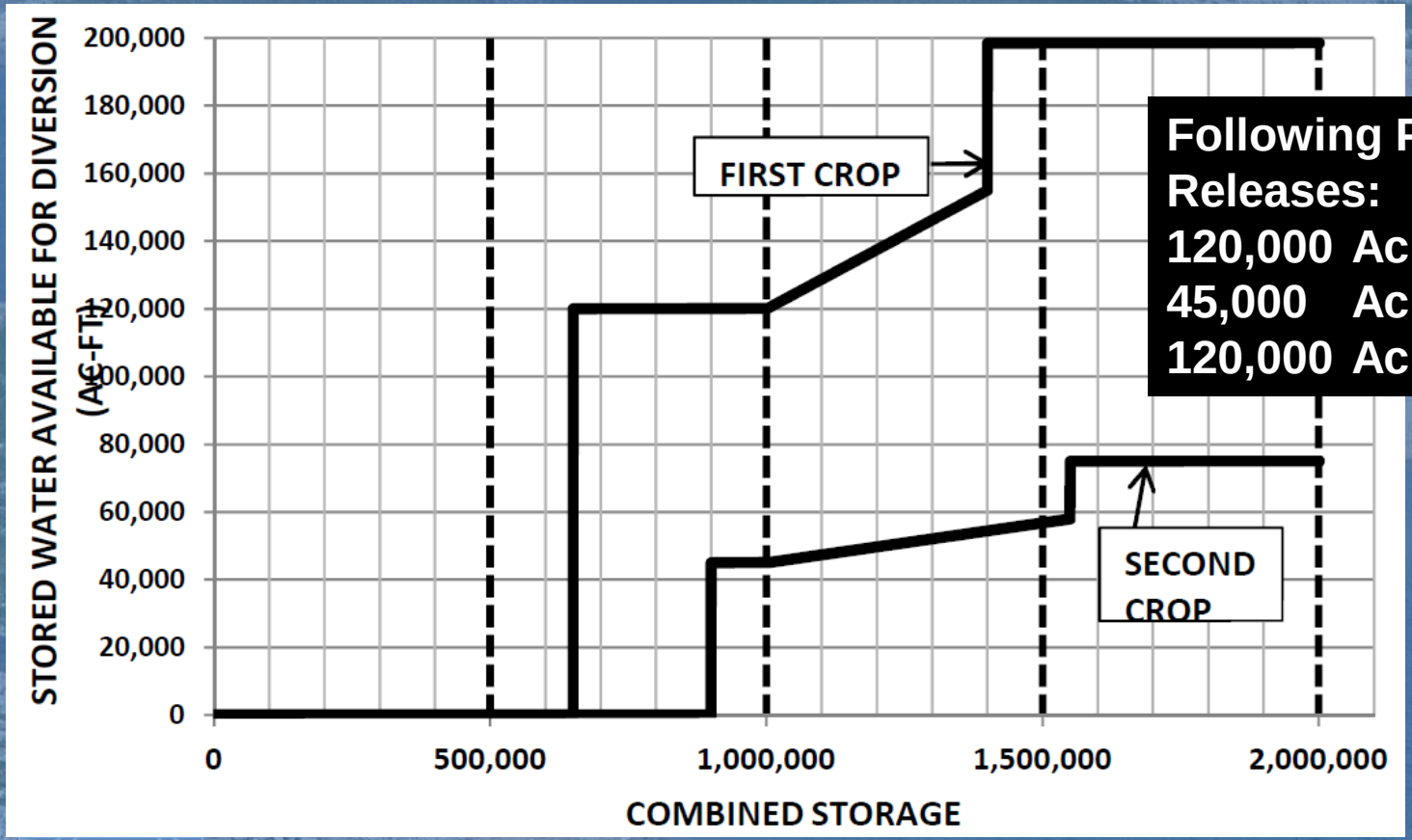
Criteria 3 - Combined Storage under 2012 WMP:

Less than 600,000 acre-ft



Following Pending WMP Releases:

120,000 Acre-ft 2012 1st Crop
45,000 Acre-ft 2012 2nd Crop
120,000 Acre-ft 2013 1st Crop

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Criteria 3 - Combined Storage Under 2012 WMP:

Less than 600,000 acre-ft

	$Storage_{January\ 1,\ 2012}$		738,715	Acre-ft
+	$Storage\_Change_{January\ 1,\ 2012\ to\ March\ 1,\ 2012}$	+	107,644	Acre-ft
+	$Storage\_Change_{March\ 1,\ 2012\ to\ June\ 1,\ 2012}$	+	182,306	Acre-ft
-	Interruptible 1st Crop Release	-	120,000	Acre-ft
	$Projected\_Storage_{June\ 1,\ 2012}$		908,655	Acre-ft
+	$Storage\_Change_{June\ 1,\ 2012\ to\ August\ 1,\ 2012}$	+	-63,897	Acre-ft
+	$Storage\_Change_{August\ 1,\ 2012\ to\ January\ 1,\ 2013}$	+	-139,768	Acre-ft
-	Interruptible 2nd Crop Release	-	45,000	Acre-ft
	$Projected\_Storage_{January\ 1,\ 2013}$		659,990	Acre-ft
+	$Storage\_Change_{January\ 1,\ 2013\ to\ March\ 1,\ 2013}$	+	-2,218	Acre-ft
+	$Storage\_Change_{March\ 1,\ 2013\ to\ May\ 21,\ 2013}$	+	-40,415	Acre-ft
-	Interruptible 1st Crop Release	-	120,000	Acre-ft
	$Projected\_Storage_{May\ 21,\ 2013}$		497,357	Acre-ft