San Antonio Bay Partnership
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GSA BBASC Study No. 5:
Strategy Options for Meeting Attainment Frequencies for the Estuaries

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The Future of San Antonio Bay
The San Antonio Bay Partnership is Planning for It!

Project Background and Need

- GSA BBASC's 2012 *Work Plan for Adaptive Management* notes that:
  - SB3 mandates that, in addition to recommending environmental flow standards, each BBASC recommend *strategies* to meet these standards
  - These *strategies* are distinct in that they have the potential to address environmental flow challenges due to existing water use permits
  - <u>What is still lacking, however, is a quantitative study focusing on the potential of selected strategies for increasing the frequency of meeting the attainment criteria for the inflows to the estuaries of the Copano/Aransas and San Antonio Bay systems</u>.

Project Goal

To identify affordable, viable strategies for achieving the greatest ecological benefit to the receiving estuaries given the limited amounts of water available to the environment during drought periods.

i.e., **Improve the effective use of limited surface water during the driest times when water is in its highest demand and flows are at their lowest.**

Project Approach

- The study will quantify freshwater volumes that could be made available to supplement inflows with implementation of a strategy option based on the donation, purchase or lease of existing water permits and the use of Aquifer Storage and Recovery (ASR) to increase storage of water for releases for environmental flows.
- <u>Project Investigators will</u>:
  - Analyze inputs used by the BBEST to calculate the minimum volume of additional freshwater inflows necessary to achieve 'Strategy' target frequencies;
  - Determine lesser volumes necessary to increase attainment frequency goals
  - Report the level of increased attainment that might be achieved by these lesser amounts.

Project Approach

Project Investigators will:

- **Evaluate *strategies* that include the donation, sale or lease of new or under-utilized water permits, and the use of Aquifer Storage and Recovery (ASR) to increase storage of water for releases for environmental flows,**
- **Determine how much additional freshwater inflow the implementation of these strategies would provide to the bay during critical periods**
- **Develop cost estimates for:**
  - The acquisition (purchase, donation or lease) of existing water rights from willing sellers
  - Capital and O&M required for the storage of water in ASR facilities
- **Describe a "path forward" for implementation, including the legal, regulatory and funding steps necessary to provide supplemental water supplies for environmental flow benefits.**

Project Approach

Project Investigators will engage with a "Project Advisory Group" comprised of scientific, legal and policy specialists with expertise in:

- BBEST/BBASC environmental flows determinations process -- particularly methods for establishing estuarine inflow requirements
- Water law/policy and water markets,
- Environmental economics/ecosystem services, and
- ASR

Project Timeline

TASK	DESCRIPTION	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15
1	Determination of volumes and timing of freshwater inflows needed to meet Strategy target frequencies															
2	Identification of strategies to provide additional freshwater inflows during times of drought															
3	Modeling and analysis to determine how various strategies would be implemented to augment freshwater inflows to better achieve estuarine attainment frequencies identified in the TCEQ environmental flow standards															
4	Costs and steps to implement strategies															
5	Report															

Project Work to Date

- Forming Project Advisory Group
  - Initial meeting held to review SOW and project approach
- Analysis of BBEST attainment targets and determination of reasonable goals for improving attainment frequencies during drought periods
- Literature review on strategies for securing water rights for environmental flows and use of ASR for increasing the reliability of less senior water rights and managing the timing of the "deployment" of stored water

Preliminary Findings and Objectives

1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Spring G1 - D = 150,000						Summer G2 - DD = 50,000						Total
Year	Natural	G1	Need	Region L	G1	Need	Natural	G2	Need	Region L	G2	Need	Need
1965	744,132	A-pr	0	549,072	A	0	167,686	C	0	49,990	DD	10	10
1988	222,380	C	0	146,699	D	3,301	219,195	B	0	95,256	CC	0	3,301
1978	238,674	C	0	146,633	D	3,367	923,579	>A-pr	0	749,624	A-pr	0	3,367
1982	651,559	A-pr	0	552,978	A-pr	0	131,669	C	0	31,421	DD	18,579	18,579
1989	221,551	CC	0	138,790	D	11,210	69,796	D	0	16,206	DD	33,794	45,004
1962	192,545	CC	0	104,668	D	45,332	138,767	C	0	52,583	D	0	45,332
1967	177,771	CC	0	101,250	D	48,750	2,206,510	>A-pr	0	2,096,470	>A-pr	0	48,750
1964	191,717	C	0	95,916	D	54,084	244,403	B	0	126,613	CC	0	54,084
1940	204,281	CC	0	79,944	D	70,056	614,201	A-pr	0	497,160	A-pr	0	70,056
1951	175,926	CC	0	79,858	D	70,142	250,257	B	0	183,668	B	0	70,142
1939	169,179	CC	0	71,243	D	78,757	231,627	B	0	127,085	CC	0	78,757
1950	210,506	CC	0	101,642	D	48,358	112,009	C	0	14,275	DD	35,725	84,083
1971	135,378	D	14,622	61,335	D	88,665	765,930	A-pr	0	561,687	A-pr	0	88,665
1984	152,098	CC	0	81,335	D	68,665	41,881	DD	8,119	7,679	DD	42,321	110,986
1955	116,744	D	33,256	33,172	D	116,828	126,407	C	0	55,841	D	0	116,828
1963	129,878	D	20,122	42,488	D	107,512	53,265	D	0	20	DD	49,980	157,492
1954	118,252	D	31,748	27,097	D	122,903	26,911	DD	23,089	0	DD	50,000	172,903
1956	71,468	D	78,532	15,406	D	134,594	18,809	DD	31,191	87	DD	49,913	184,507

Preliminary Findings and Objectives

Determination of volumes and timing of freshwater inflows needed to meet Strategy target frequencies:

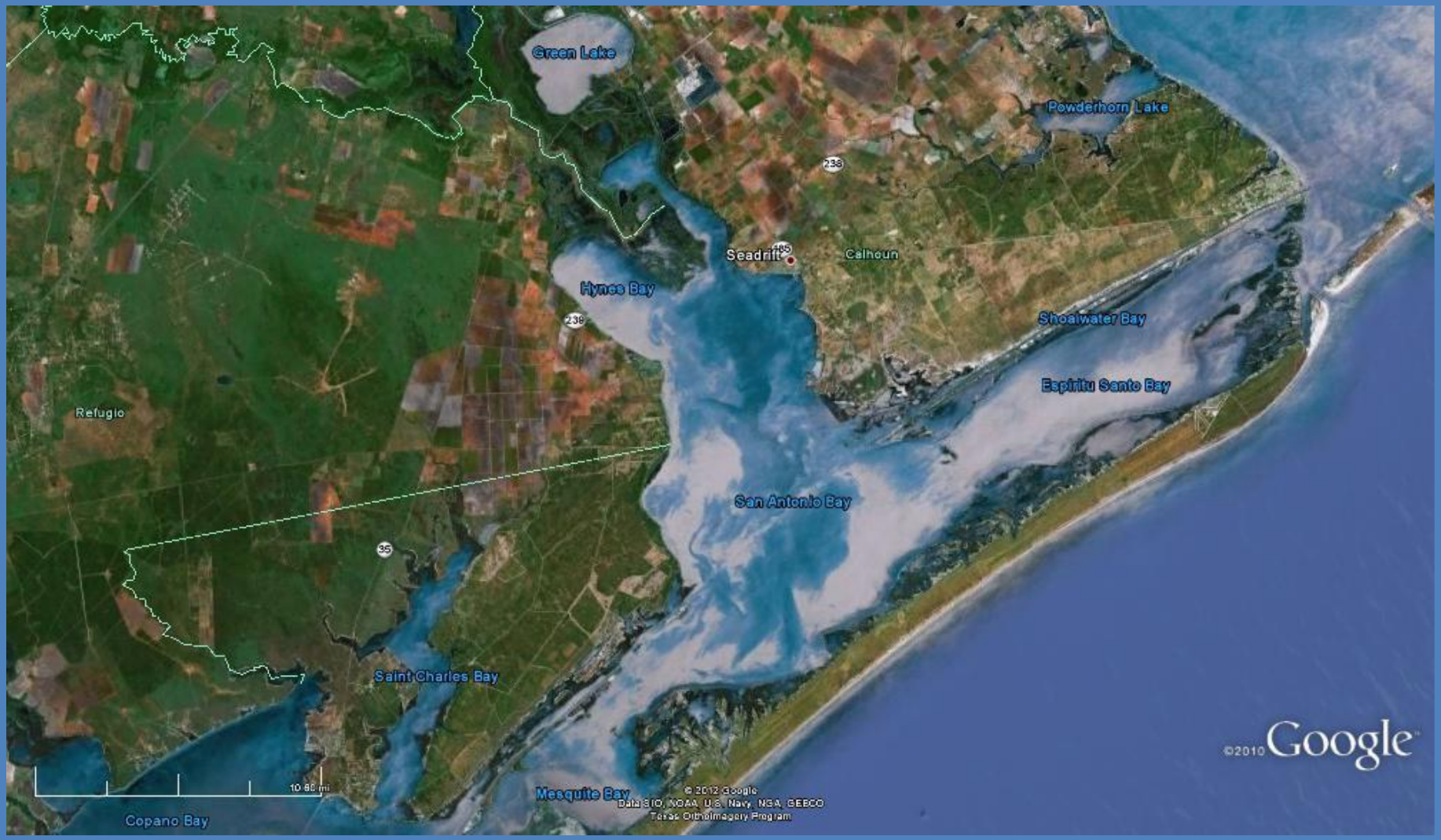
- **Attainment goals for inflow frequencies based on historical inflows (1941-2009).**
- **WAM simulations (1934-1989) for Present conditions (Run 8) and Potential Future (Region L) indicate lower tiered targets (G1-D, G2-DD) are not met at Target Frequencies.**
- **Meeting these frequency targets could require up to 88,000 in driest years.**

Integrating Results into the GSA BBASC Adaptive Management Plan

- Project results should provide quantitative information on:
  - Potential quantities of additional estuarine inflows generated by acquiring water rights and using ASR to increase their utility; and
  - The costs associated with these strategies.

- This information, along with the analysis of the legal and institutional issues associated with the implementation of these strategies, will assist the GSA BBASC in determining whether to amend the Adaptive Management Plan to adopt these as recommended management strategies.

Questions?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