Engineering Alternatives Venice Beach and GRR

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USACE Jacksonville District

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U.S.ARMY

US Army Corps of Engineers
BUILDING STRONG®

Sarasota County: Venice

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Authorization:

Water Resources Development Act: WRDA 1986 (Public Law 99-662) in accordance with the Chief of Engineers Report dates 28 February 1986.

Construction:

Initial: May 1996
1st Nourishment: August 2005
2nd Nourishment: February 2015
End 50 year Federal Participation: 2046

Cost Share:

Original: FED 72.55%/NF 27.45%
After LRR: FED 65.8%/NF 34.2%

Engineering Alternatives

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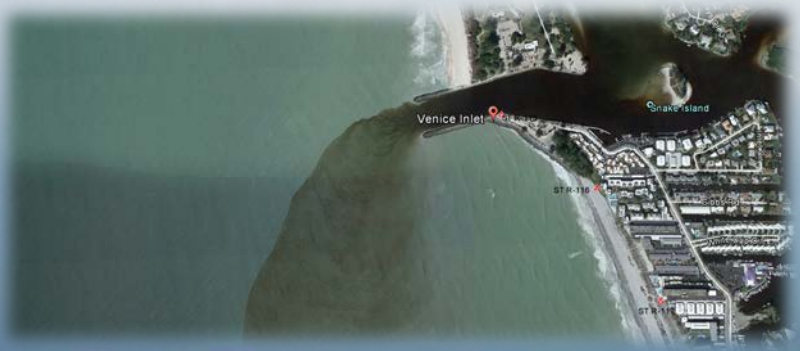
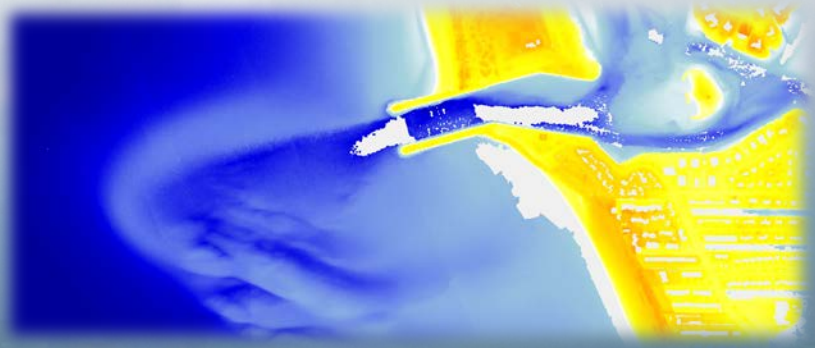
Traditional Technologies

- Groins
- Jetty Spur
- Breakwater
- Seawall
- Beach Nourishment

Innovative Technologies

- Beach Dewatering
- Low-Profile Groins
- Permeable Groins
- Geotextile Construction
- Catch Basin / Sand Bypassing
- Reef Balls





Jetty Spur

- A jetty spur is a relatively short structure extending at an angle from the main jetty axis that protects a navigation channel. The spur diverts sediment that may shoal in the channel back towards the beach, where it can nourish the beach.
- Spurs are usually constructed of rock rubble similar to the connecting jetty.
- Spurs are typically nearly perpendicular to the jetty, but may also be constructed at some angle with respect to the jetty up to about 45 deg.

Jetty Spur

ERDC/CHL CHETN-IV-66
February 2006

Figure 1. Example of jetty spurs at Siuslaw River Inlet, OR. Spur lengths are 122 m

Traditional Technologies

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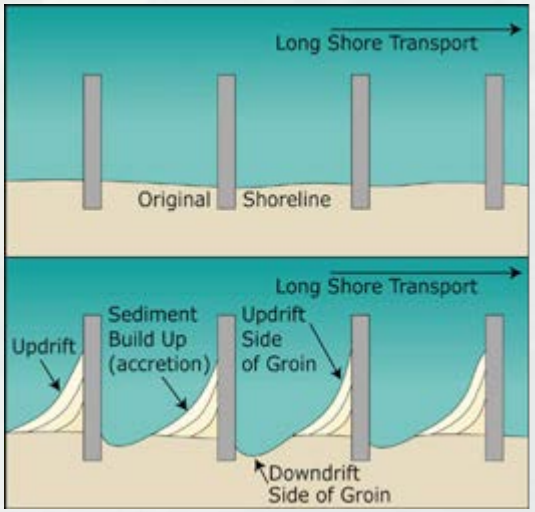
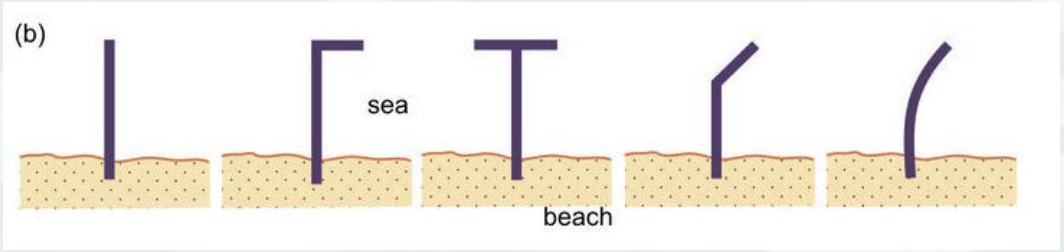
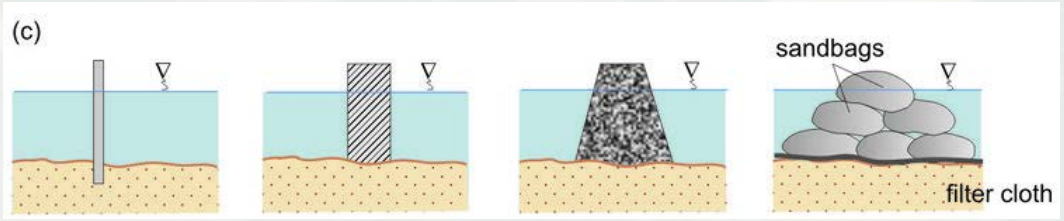
Traditional Groins and T-Head Groins

- Interruption to alongshore sediment transport
- Updrift accretion
- Downdrift erosion



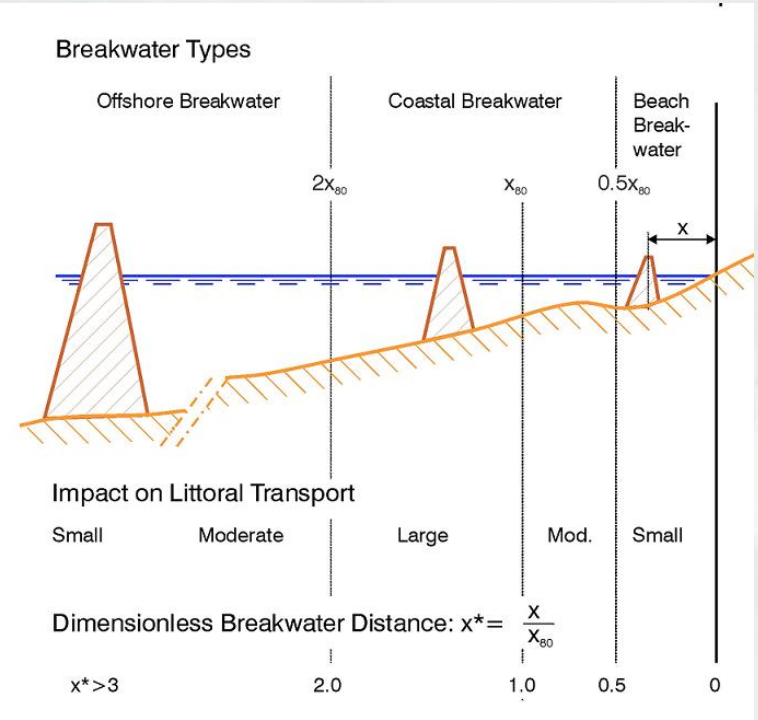




Traditional Technologies

Breakwater

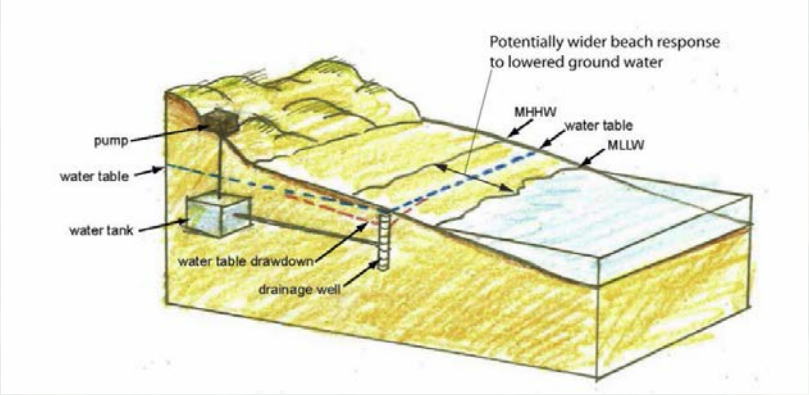
- Breakwaters reduce the intensity of wave action in inshore waters and thereby reduce coastal erosion or provide safe harbor.

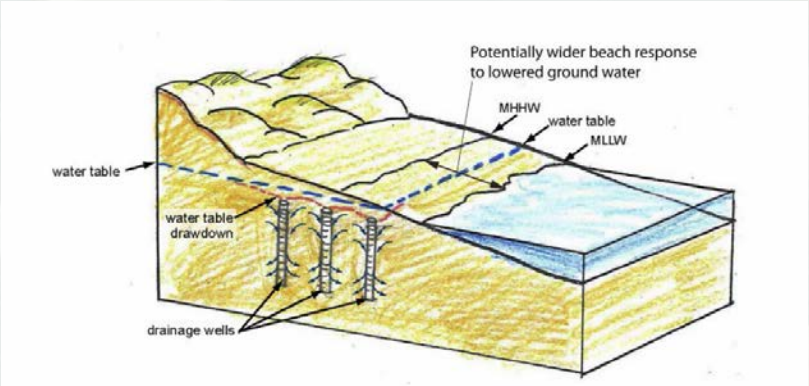


Dewatering Systems

- Generally, beach dewatering involves the removal of water from the beach to increase the natural accretion processes.
- Dewatering works on the hypothesis that a dry beachface will improve swash infiltration and thus deposit sediment on the beach.

Dewatering Systems

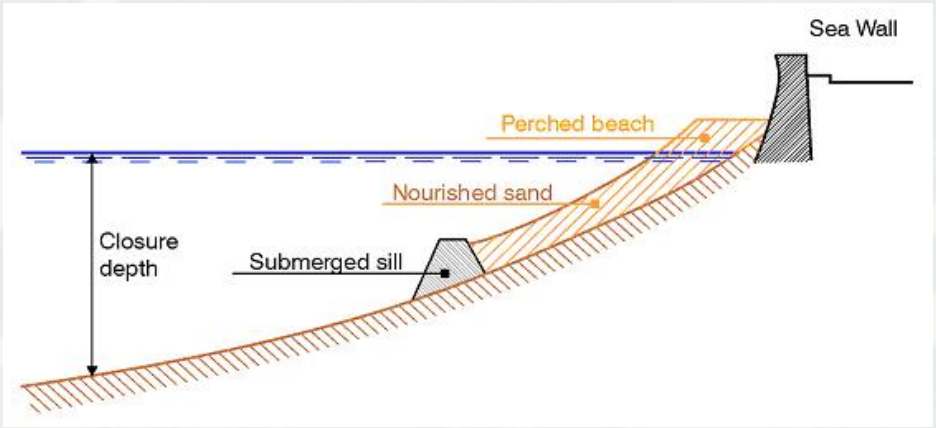




Innovative Technologies

Low-Profile/Submerged Structures

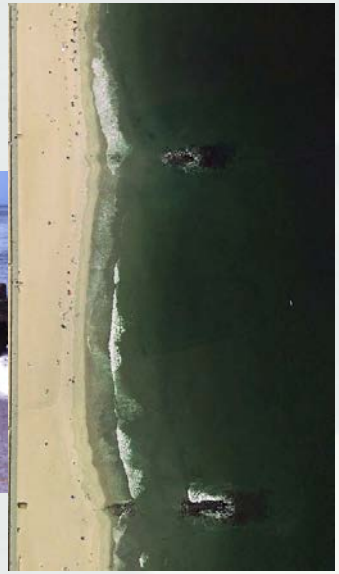
- Low Profile Groins (orthogonal)
- Perched Beach (parallel)
  - A perched beach provides a wider beach at locations where the natural beach has become too narrow and low due to the erosion of the coastal profile at a location, where the coastline is fixed.



Innovative Technologies

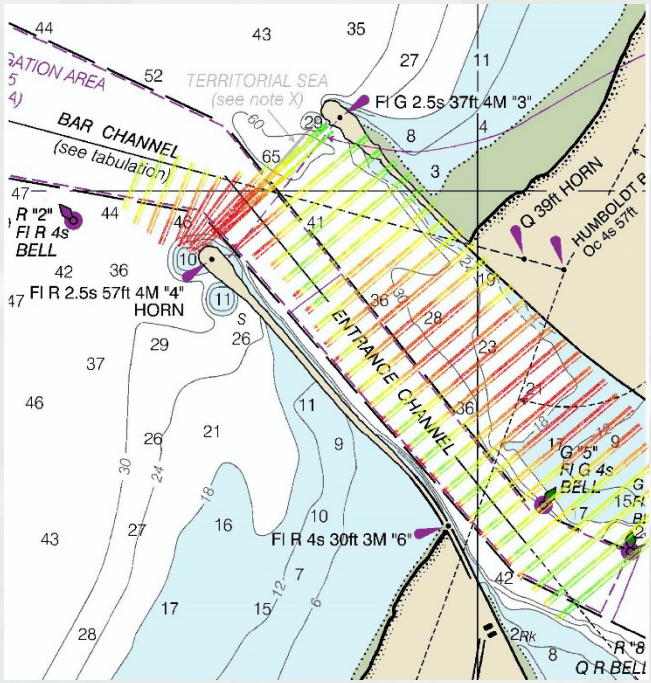
Permeable Groins / Adjustable Groins

- Permeable / Adjustable Groins
  - Permeable adjustable groins can be adjusted to increase the permeability to enhance bypassing.
  - Permeable groins have an enhanced ability to bypass sediments but at a fixed rate related to the incident transport flux
  - Notched groins can bypass sediments through the notch in the surf zone
  - Permeable pile groins are another example of groins that have an ability to bypass sediments



Sediment Trap / Bypassing Systems

- Sediment Trap / Pump
- Navigation channels



Innovative Technologies

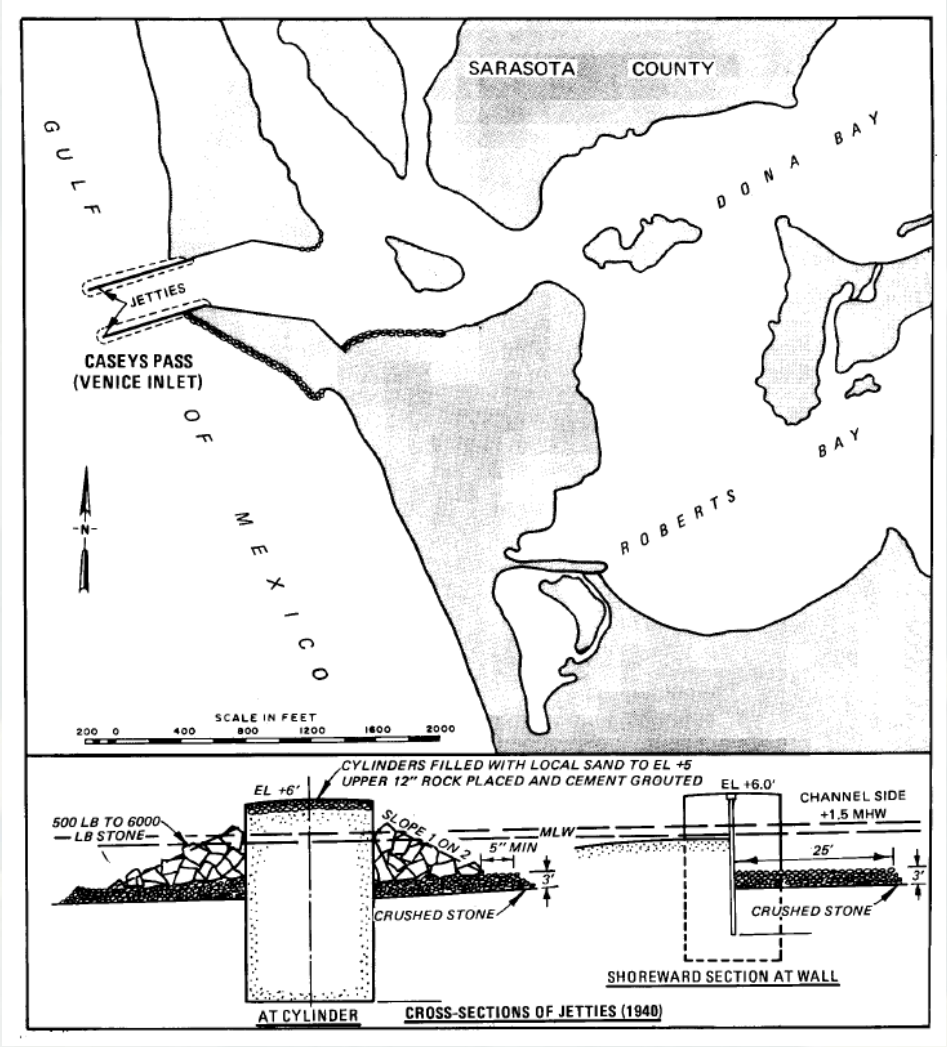
Artificial Reef / Submerged Breakwaters

- Reef Balls
- Submerged reef
  - ASR

Design Considerations

Design Considerations

- Historical Data
- Oceanographic parameters



What is a General Reevaluation Report?

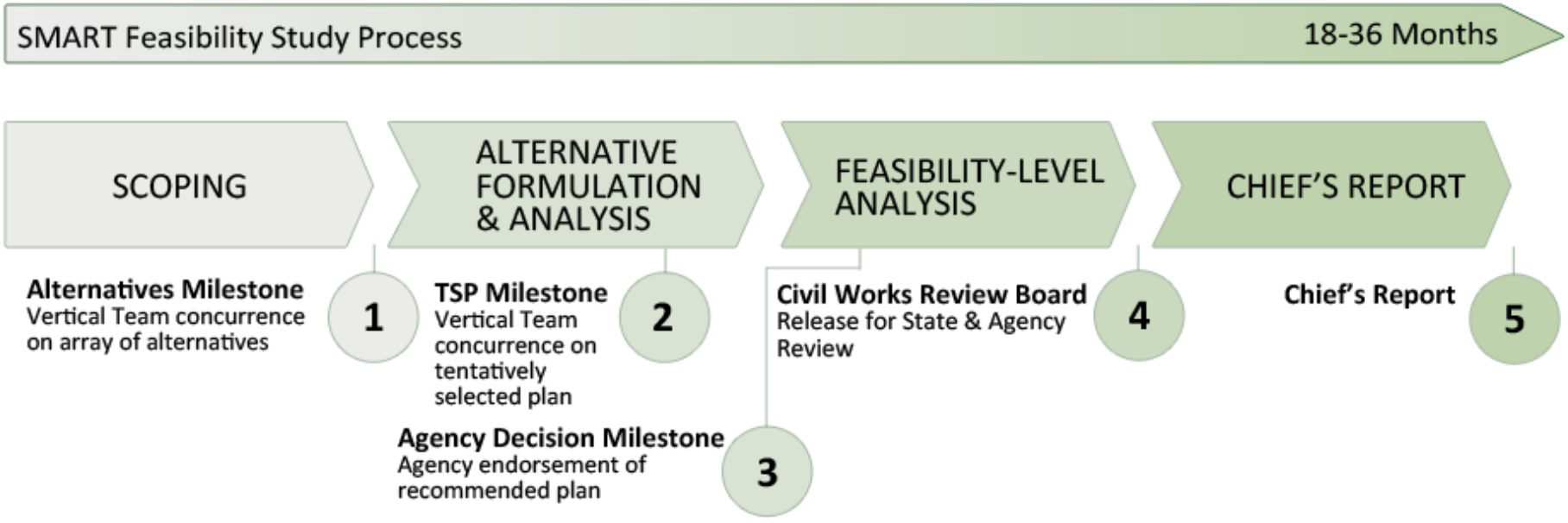
"SMART" Planning?

- ✓Specific
- ✓Measurable
- ✓Attainable
- ✓Risk-Informed
- ✓Timely

"3x3x3"?

- Under $3M total
- Within 3 years
- Using 3 levels of enhanced vertical teaming
- 100 page main reports, with appendices that fit in a 3" binder

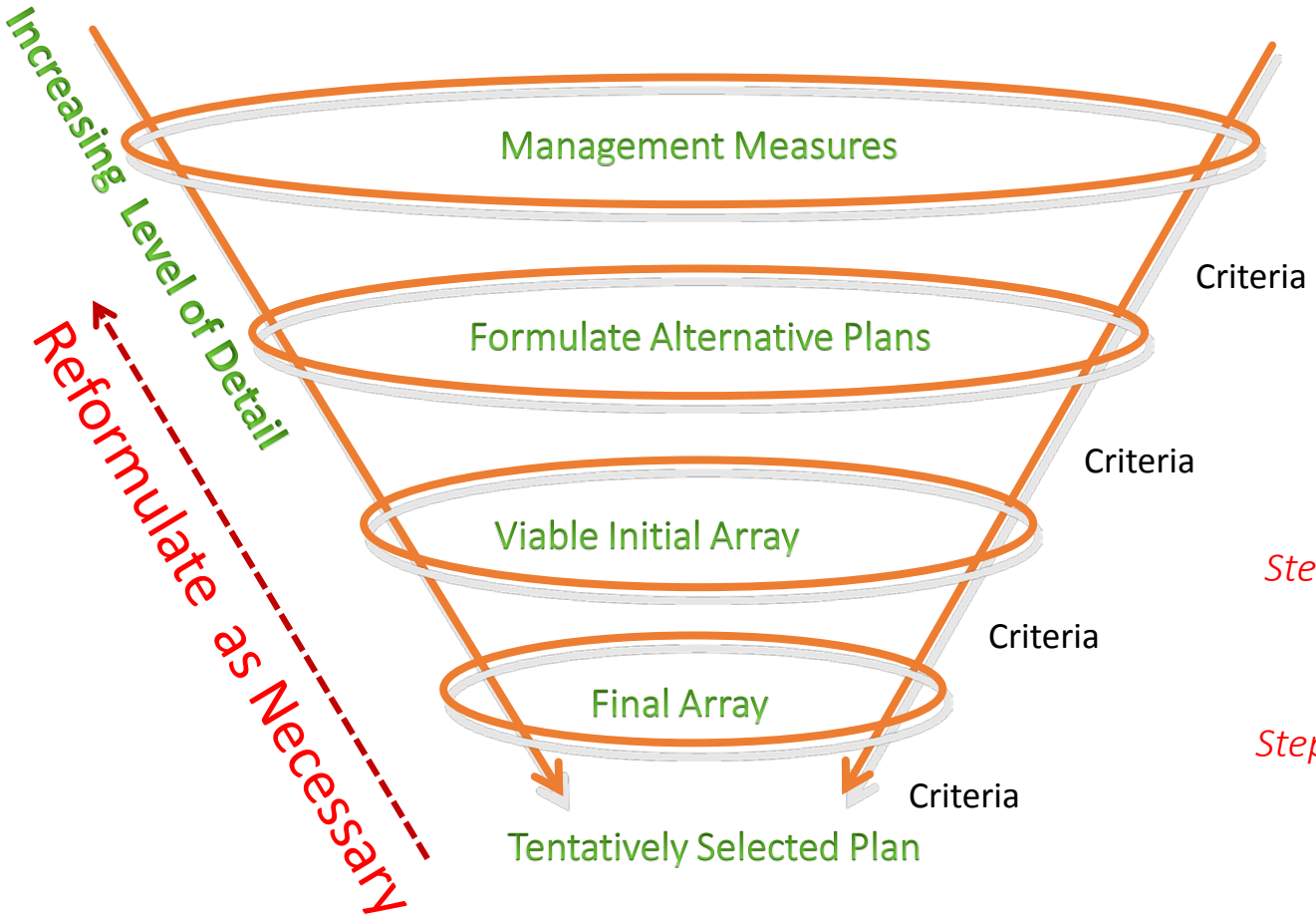
General Reevaluation Report (GRR)



SMART Planning

- Focuses on incremental decision making in a progressive 6-step planning process
  - Identifies next decision to be made and manages uncertainty in making it
    - Only collect data needed
    - Make decision
    - Move on to next decision
  - Incorporates quality engineering, economics, real estate and environmental analysis
- Fully compliant with environmental law (NEPA, etc…)
- Includes public involvement

Plan Formulation Process



Step 1: Specify Problems and Opportunities

Step 2: Inventory and Forecast

Step 3: Formulate Alternative Plans

Step 4: Evaluate Alternative Plans

Step 5: Compare Alternative Plans

Step 6: Plan selection

General Reevaluation Report (GRR)

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SMART PLANNING

Step 1: Sarasota County send official letter requesting the Corps perform a “New Phase” Study.

Step 2: Corps request funding for a “New Phase” GRR.

Step 3: Congress appropriates funds for USACE to enter into a Feasibility Cost Share Agreement and begin GRR

Step 4: Begin the 6 Step Planning Process:

1) Identify problems and opportunities
2) Inventory and forecast conditions
3) Formulate Alternatives
4) Evaluate Alternatives
5) Comparing Alternatives
6) Select Plan

Risks Associated with GRR

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You have an authorized Federal Project with one of the highest cost share percentages

Potential Risk of no longer having a justified project.

Potential Lower Cost Share

Potential reduced beach profile

Future Concerns

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What happens after federal participation ends?

WRDA2014: Section 1037. Hurricane and Storm Damage Reduction

…‘(b) REVIEW.—Notwithstanding subsection (a), the Secretary shall, at the request of the non-Federal interest, carry out a study to determine the feasibility of extending the period of nourishment described in subsection (a) for a period not to exceed 15 additional years beyond the maximum period described in subsection…

(potential to extend project to 2046+15=~2061)

RSM: Cross Business Line Benefits
2013 SAJ RSM VALUE TO THE NATION

FY13 NAVIGATION RSM	TOTAL COST (NAV)	PLACEMENT	BEACH VOLUME**	ROUGH VALUE TO FRM***
Port Everglades* (partial)	$ 1,898,489	Broward SPP	96,126	$5,959,812
Palm Beach Harbor	$ 4,870,074	Palm Beach Co NF	420,000	$6,300,000
Ft Pierce Inlet	$ 3,299,090	Fort Pierce SPP	191,000	$2,330,200
St Lucie Inlet	$ 6,465,600	Martin Co. SPP	200,000	$3,000,000
St Augustine Inlet	$ 1,932,600	St Johns SPP	116,000	$696,000
Ponce Inlet (SAW)	$ 1,000,000	St Lucie SPP (NS)	141,000	$2,115,000
AIWW-Jupiter Inlet	$ 2,601,207	Palm Beach Co	55,000	$825,000
AIWW-Haulover Inlet		Dade Co. SPP	120,000	$6,180,000
	$ 22,067,060			**$27,406,012**
King's Bay EC (NAVY)	$ 8,030,480	Nassau Co SPP	121,046	$ 1,361,768

INCREASED VALUE TO NATION

* Includes $1.2M NF (MOA)
** Includes 15% placement losses
*** Contract costs only, additional FRM value for E&D/S&A not included