A person in a wetsuit is seen from the chest up, floating in the water. The background is a bright, shimmering surface of water with many small, bright reflections of light. The overall scene is bright and somewhat hazy.

Properties of the Southern Estuaries that make them both crucial and challenging to monitor/assess

VALUABLE

**\$billions in terms of
fishing, seafood and
tourism; high profile
with public**

LARGE

**Florida Bay ~ 1,800 km²
Biscayne Bay ~ 750 km²**

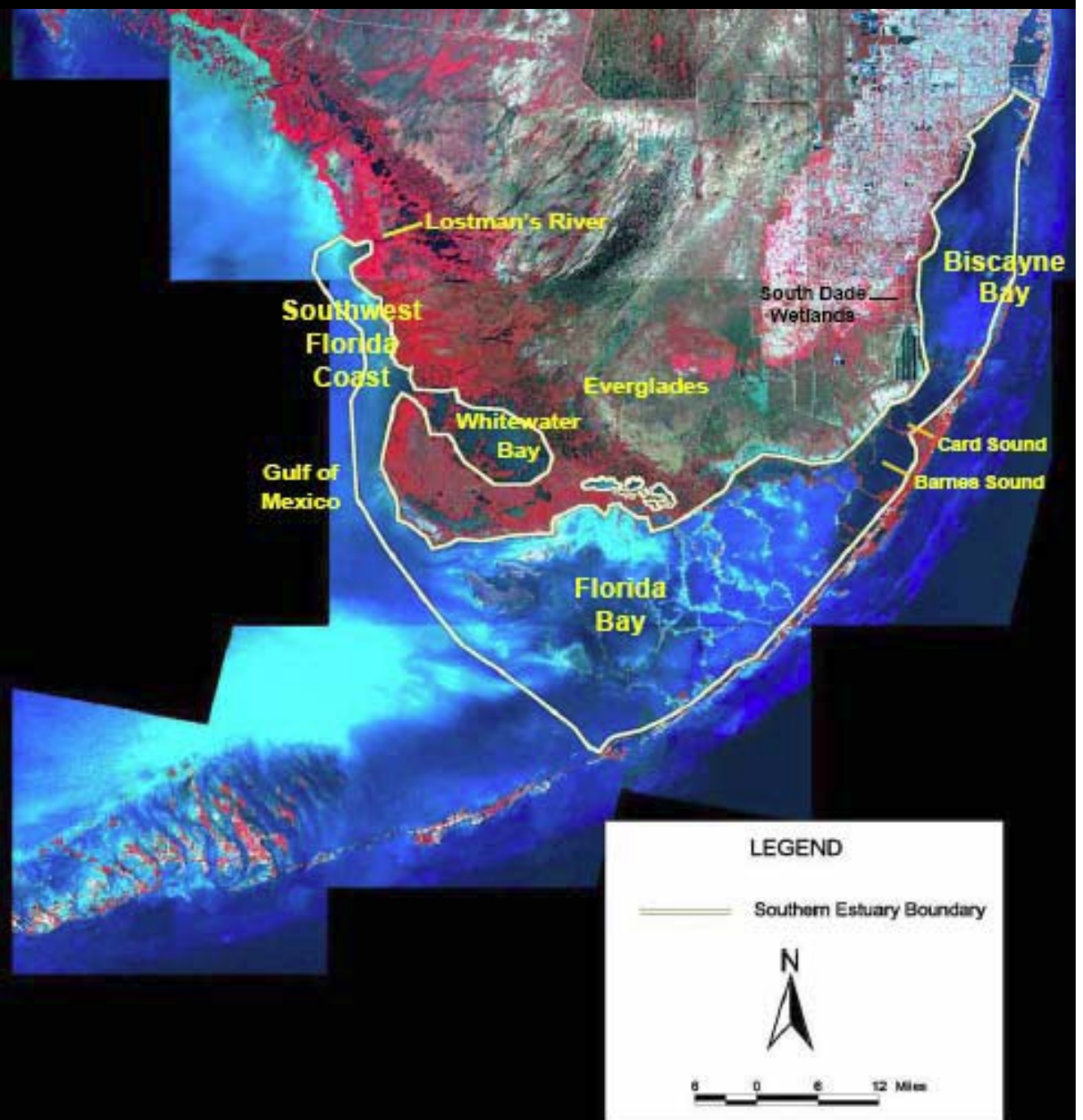
COMPLEX

**Structure, function, dynamics, geography (i.e.,
“sandwiched” between entirely marine and entirely
freshwater systems with a heavy human footprint)**

Biscayne
Bay

Florida Bay

Southwest
Florida
Coast



List of Monitoring Projects

3.2.3.2	Biscayne Bay Salinity Monitoring Network	\$818,533	2	3	X	\$163,000	\$167,300	\$172,233	USACE	Cooperative Agreement	Work in Progress	BNP
3.2.3.1 & 3.2.3.2	Water Quality, Salinity, and Circulation Monitoring	\$500,000	2	2		\$250,000			USACE	MOA	\$250,000 from FY06 funds; \$250,000 in FY07 funded under CERP PLA	NOAA
3.2.3.3	Coastal Wetland Fishes	\$228,302		3		\$88,745	\$68,747	\$70,810	USACE	MOA	WO in Routing	NOAA/ENP
3.2.3.3	South Florida Fish Habitat Assessment Network (FHAP) expansion	\$1,460,000	3	3	X	\$170,000	\$250,000	\$250,000	SFWMD	Cooperative Agreement	Work in Progress	FMRI
3.2.3.3 & 3.2.4.7	Survey of Benthic Habitat in Biscayne Bay	\$456,517		3		\$150,171	\$154,958	\$151,388	USACE	MOA	WO in Routing	NOAA
3.2.3.4	Large Scale Remote Sensed SAV Monitoring Program	\$50,000	2	2		\$45,000			SFWMD	PO	Work in Progress	FMRI
3.2.3.4	Large Scale Remote Sensed SAV Photo Interpretation	\$185,161	1	2		\$135,161	\$50,000		SFWMD	Cooperative Agreement	SOW in Development	FMRI
3.2.3.5	Seagrass Fish and Invertebrate Assessment Network (FIAN) AND 3.2.4.5	\$564,212	3	5		\$156,267	\$51,451		USACE	MOA	Work in Progress	USGS
3.2.3.5	Seagrass Fish and Invertebrate Assessment Network (FIAN)	\$261,083					\$104,816	\$156,267	USACE	MOA	recommended continuation	USGS
3.2.3.5 & 3.2.4.7	Epifauna Relationships in Nearshore Biscayne Bay	\$460,000		3		\$150,000	\$155,000	\$155,000	USACE	MOA	WO in Routing	NOAA
3.2.3.6	Shoreline Fish Community Visual Assessment	\$840,455	3	4		\$154,025	\$172,000	\$179,350	USACE	MOA	Work in Progress	NOAA
3.2.3.7	Juvenile Spotted Seatrout Monitoring in Florida Bay	\$921,380	3	4		\$160,158	\$179,987	\$191,247	USACE	MOA	Work in Progress	NOAA
3.2.4.3	Dissolved Organic Matter Fate & Effect	\$200,000	1	3		\$150,000			SFWMD	University RFP	SOW in Development	
3.2.4.3	Dissolved Organic Matter Fate & Effect Support Costs	\$91,000	1	1		\$25,000			SFWMD	PO's	SOW in Development	
3.2.3.4	Past & Present Distribution of Oysters in Shark River-Whitewater Bay	\$350,000	2	3		\$150,000	\$150,000		SFWMD	University RFP	Work in Progress	FGCU
3.2.3.5	Seagrass Fish and Invertebrate Assessment Network (FIAN) AND 3.2.4.5	\$1,267,491	3	5		\$346,661	\$101,337		USACE	MOA	Work in Progress	NOAA
3.2.3.5	Seagrass Fish and Invertebrate Assessment Network (FIAN)	\$589,985					\$245,324	\$344,661	USACE	MOA	recommended continuation	NOAA
3.2.3.6	Salinity Relationship in Pink Shrimp	\$390,000	2	3		\$125,000	\$120,000	\$100,000	SFWMD	University RFP	Work in Progress	FIU
3.2.4.10	Manatee Abundance & Distribution Study	\$171,000	3	3					USACE	Support Agreement	Work in Progress	USFWS
3.2	Coral Reef Monitoring	\$360,000	2	2		\$360,000			USACE	MOA	\$360,00 in FY07 Funded under CERP PLA (covers \$180,000/yr for FY06 and FY07)	NOAA

Hypothesis clusters

- Salinity
- Water Quality
- SAV
- Nursery-Community

Salinity

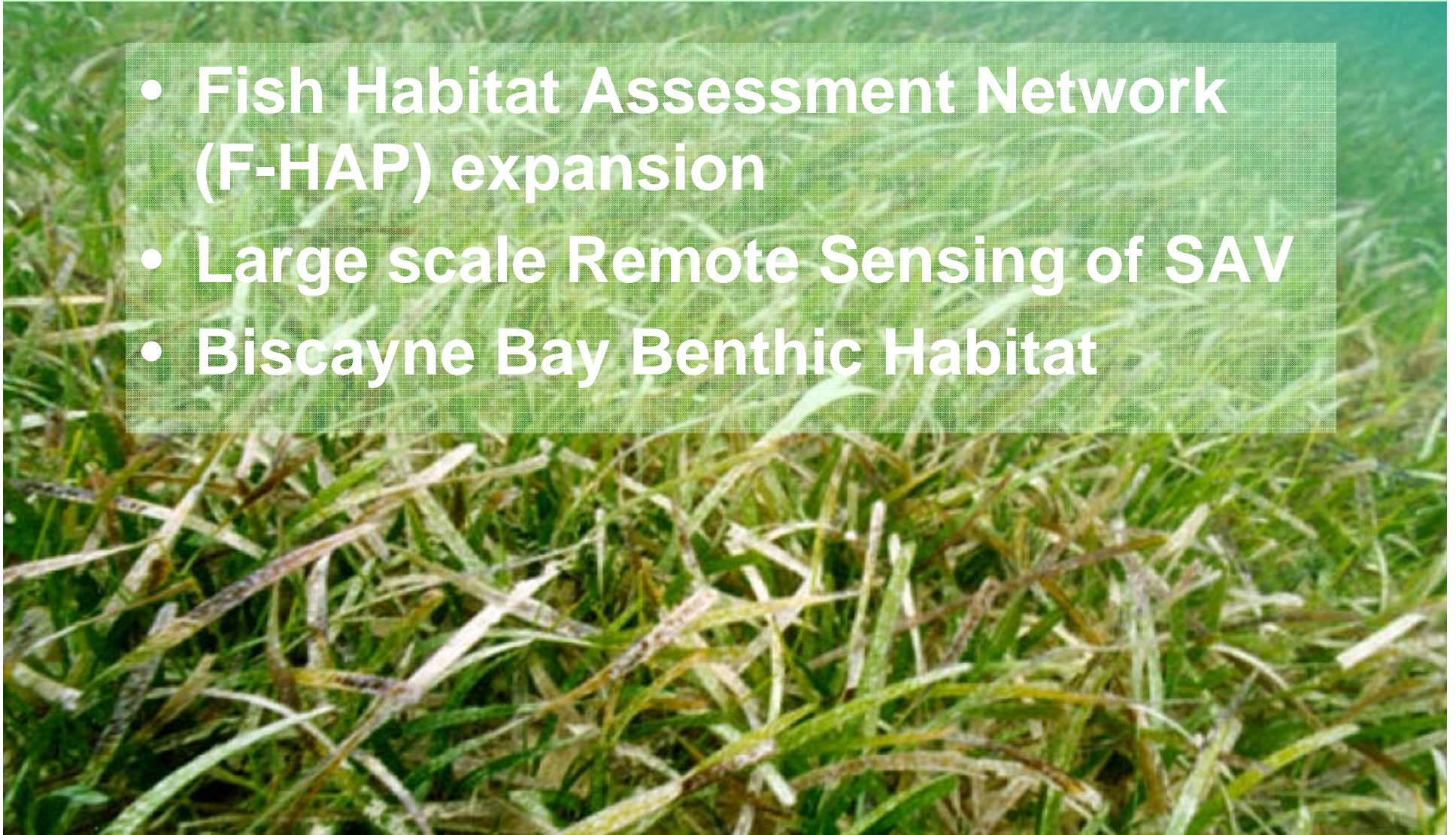
- Temporally intensive salinity monitoring in Biscayne Bay using continuous recorders at fixed sites.
 - Recent review of these data led to planned relocation of some of the monitoring instruments.
- Spatially intensive salinity monitoring along cruise tracks.


Water Quality

- Monitoring of chlorophyll and salinity in Biscayne Bay and Florida Bay
- Dissolved Organic Matter Fate and Effects

SAV

- Fish Habitat Assessment Network (F-HAP) expansion
- Large scale Remote Sensing of SAV
- Biscayne Bay Benthic Habitat





Nursery-Community

- Seagrass Fish and Invertebrate Assessment Network
- Juvenile Spotted Seatrout Monitoring
- Biscayne Bay Shoreline fish visual survey
- Biscayne Bay Nearshore Epifauna Community
- Biscayne Bay Coastal Wetland Fishes
- **Oysters**

Others

- Crocodiles
- Manatees

T. L. Jackson



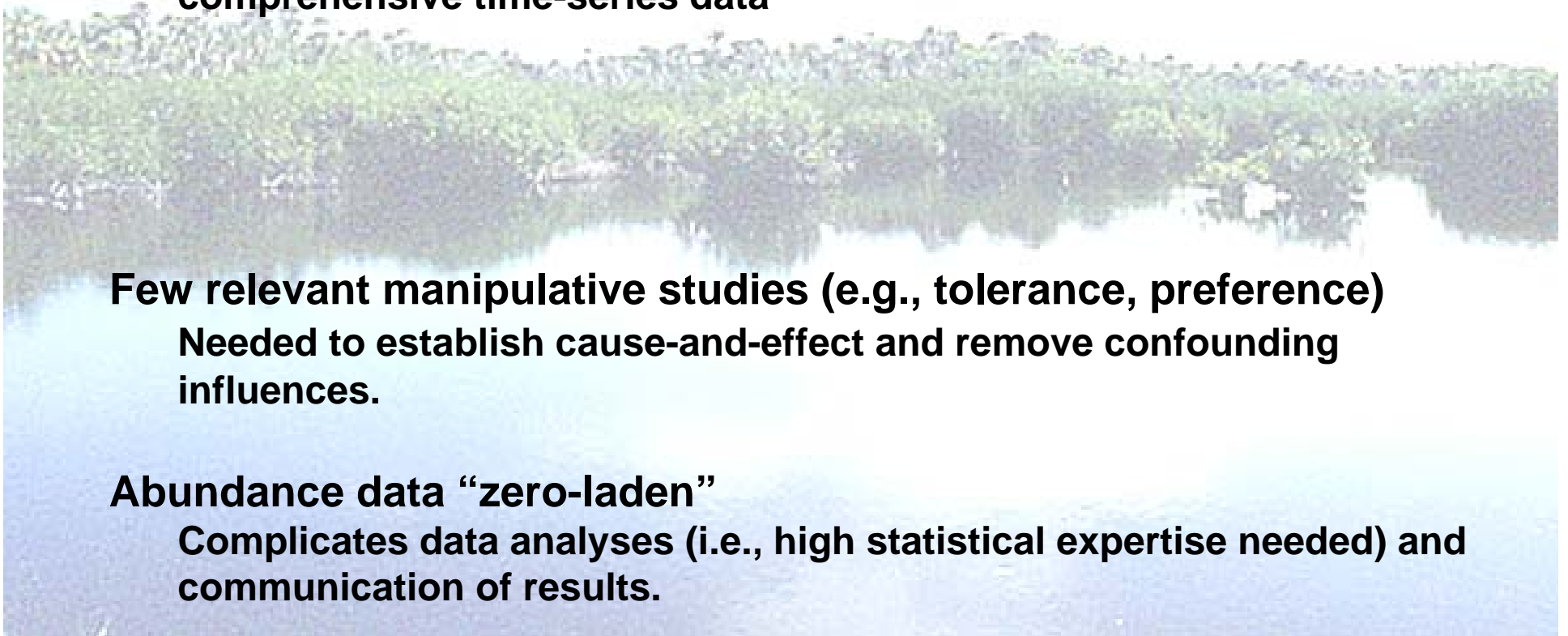
Common Data Issues

Little or no historical (pre-development, precanal system) data
Requires applying data from other systems or assuming that relationships derived from impacted systems will apply to restored systems

Pre-CERP field data patchy and/or spatio-temporally limited
Requires sufficient, uninterrupted funding streams for spatially-comprehensive time-series data

Few relevant manipulative studies (e.g., tolerance, preference)
Needed to establish cause-and-effect and remove confounding influences.

Abundance data “zero-laden”
Complicates data analyses (i.e., high statistical expertise needed) and communication of results.



Common Opportunities

Most monitoring efforts gather data on multiple properties of multiple species

Species properties measured: spatial distribution, frequency of occurrence, density, size structure.

Allows greater flexibility in identifying indicator species.

Opportunity for developing community metrics.



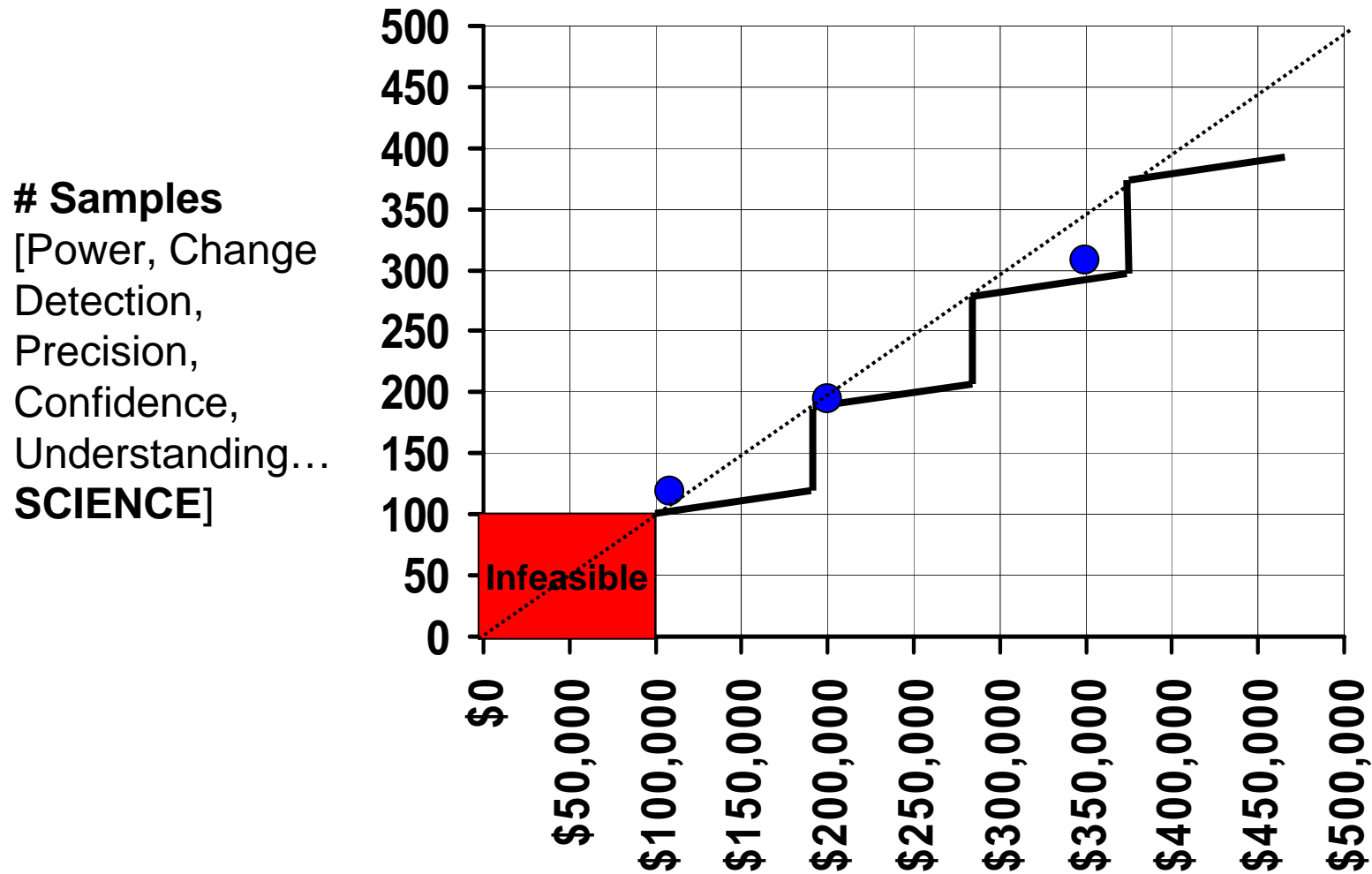
Common Problem

- Possible future budget reductions.
- Personnel and field operations are greatest costs.
- Non-linear relationship between cost reduction and loss of information

- **Indicator reduction \neq Budget reduction**



Funding-Monitoring Relationships



Sampling and funding are not linearly related
(largest budget item is personnel)

Southern Estuaries

- **Big size**
- **High value**
- **High profile**
- **At the downstream end of water management and restoration projects**

