



2nd Reef Resilience Conference

Uses and economic value of reefs in South Florida

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Three studies on marine-based recreation in south Florida

- 2001 – Socioeconomic Study of Reefs in Southeast Florida, Johns, Hazen and Sawyer; Leeworthy, NOAA; Bell and Bonn, Florida State University; funded by NOAA, FWC, 5 counties
- 2010 – Comparison of recreation activities in Florida Keys over 12 years: *Visitor Study: Selected Comparisons 1995-06 and 2007-08* and *Monroe County Resident Recreation: Selected Comparisons 1995-06 and 2008*. Vernon R. Leeworthy, Office of National Marine Sanctuaries, National Ocean Service, NOAA



Recreational reef use is important component of our economy

Percent of County Income and Employment Tied to Reef Use

| County | Personal Income (a) | Employment |
|------------|---------------------|------------|
| Martin | 0.11 | 0.24% |
| Palm Beach | 0.42 | 0.98% |
| Broward | 2.19 | 4.19% |
| Miami-Dade | 1.07 | 1.46% |
| Monroe | 4.98 | 19.00% |

(a) Personal income is income from all sources including employee compensation, proprietor's income, other property income and government transfer payments.

SE FL residents & visitors spent 29 million person-days on reefs in 2001

65% of Person-Days Spent on Natural Reefs

Number of Person-Days (in millions) Spent on Reefs June 2000 to May 2001

| County | Artificial Reefs | Natural Reefs | All Reefs |
|--------------|------------------|---------------|--------------|
| Martin | 0.26 | 0.27 | 0.53 |
| Palm Beach | 1.41 | 2.83 | 4.24 |
| Broward | 3.97 | 5.46 | 9.43 |
| Miami-Dade | 2.95 | 6.22 | 9.17 |
| Monroe | 1.58 | 3.88 | 5.46 |
| Total | 10.17 | 18.66 | 28.83 |

A person-day is one person participating in a recreation activity for all or a part of one day.

Source: Socioeconomic Study of Reefs in Southeast Florida and in Martin County Florida (Johns, Leeworthy, Bell and Bonn (2001) and Hazen and Sawyer (2004)) funded by NOAA, FWC and the counties

Recreation split evenly between snorkeling/diving and fishing in 2001

**Number of Person Days on All Reefs by Recreational Activity
June 2000 to May 2001 – Residents and Visitors (in millions)**

| Activity | Martin | Palm Beach | Broward | Miami-Dade | Monroe | Total | % of Total |
|-----------------------|-------------|-------------|-------------|-------------|-------------|--------------|-------------|
| Snorkeling | 0.04 | 0.74 | 1.09 | 2.11 | 1.75 | 5.73 | 20% |
| Diving | 0.04 | 1.73 | 3.85 | 1.14 | 0.83 | 7.59 | 27% |
| Fishing | 0.45 | 1.76 | 4.45 | 5.90 | 2.45 | 15.01 | 53% |
| GB Boats ^a | 0.00 | 0.00 | 0.05 | 0.02 | 0.08 | 0.15 | 1% |
| Total | 0.53 | 4.23 | 9.44 | 9.17 | 5.11 | 28.48 | 100% |

a. Glass bottom (GB) boats - Residents were not asked about their participation in glass bottom boat sightseeing. Therefore, the glass bottom boat category includes only visitors.

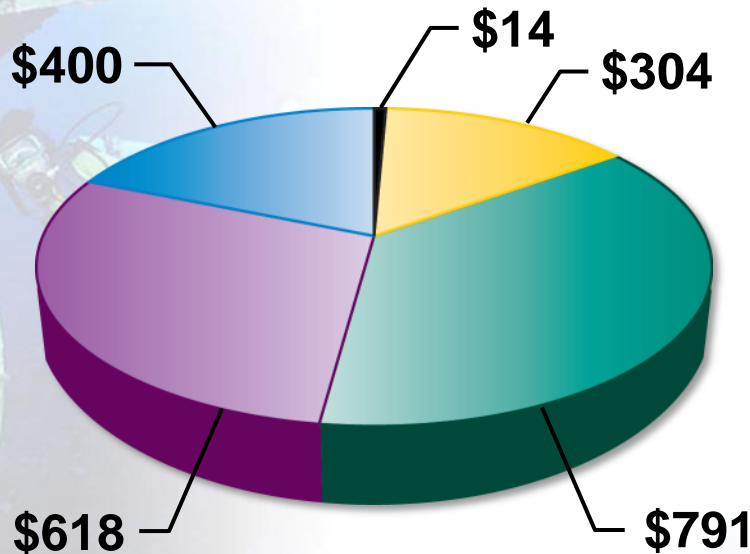
Annual value of Southeast Florida reefs to users was \$3.3 billion in 2001

Annual Use Value of Reefs for Recreation In Southeast Florida, 2001 (millions of 2001 dollars)

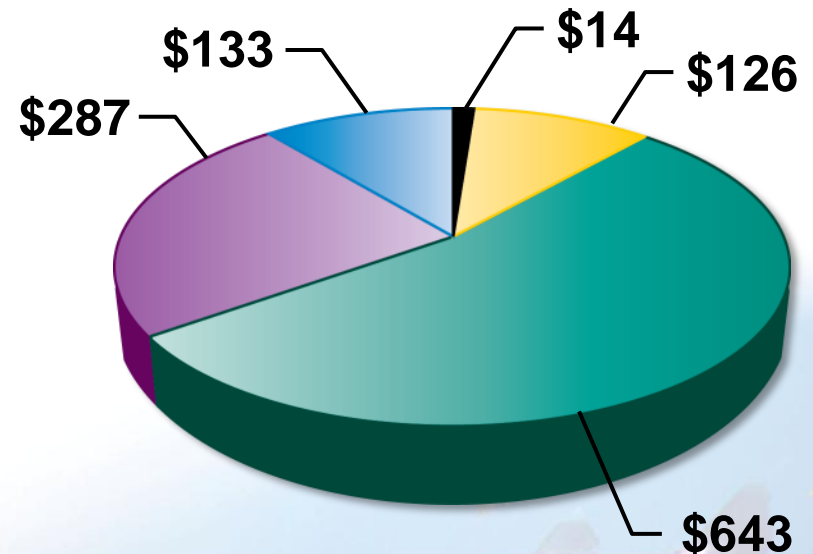
| Reef-related Value | Natural Reefs | Artificial Reefs | Total |
|---|----------------------|-------------------------|----------------|
| Expenditures | \$1,894 | \$1,114 | \$3,008 |
| Pay to Protect in Existing Condition | \$233 | \$89 | \$322 |
| Total | \$2,127 | \$1,203 | \$3,330 |

Breakdown of 2001 reef use value in million dollars

Natural reef use value was \$2.1 billion



Artificial reef use value was \$1.2 billion



■ Martin ■ Palm Beach ■ Broward ■ Miami-Dade ■ Monroe

Recreation in the Florida Keys – Comparison over 12 years

Number of Person-Days Participating in Recreation Activity Over 12-months (thousands) (a)

| Activity | 1995-96 | | | 2007-08 | | |
|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | Residents | Visitors | Total | Residents | Visitors | Total |
| Snorkeling – all | 747 | 1,703 | 2,450 | 358 | 1,854 | 2,212 |
| SCUBA Diving – all | 170 | 534 | 704 | 106 | 452 | 558 |
| Fishing – all | 890 | 1,950 | 2,840 | 757 | 1,312 | 2,069 |
| Total | 1,807 | 4,187 | 5,994 | 1,221 | 3,618 | 4,839 |

(a) Activity may or may not have been spent on an artificial or natural reef.

Source: Leeworthy, Vernon R. 2010. Visitor Study: Selected Comparisons 1995-06 and 2007-08 and Monroe County Resident Recreation: Selected Comparisons 1995-06 and 2008. Office of National Marine Sanctuaries, National Ocean Service, National Oceanic and Atmospheric Administration, July and October 2010,

Recreation related to reef use in Florida Keys fell 19 percent from 1995 to 2007

Percent Change in Recreation Activity From 1995 to 2007

| Activity | Residents | Visitors | Total |
|-------------------------|-------------|-------------|-------------|
| Snorkeling – all | -52% | 9% | -10% |
| SCUBA Diving – all | -38% | -15% | -21% |
| Fishing – all | -15% | -33% | -27% |
| All 3 Activities | -32% | -14% | -19% |

Reduced water-based recreation due to changes in resident & visitor attributes

Percent Change from 1995 to 2007

| Item | Percent Change | Comments |
|---|----------------|---|
| Resident population % of residents who participate in water – based activities | -13% | Explains reduction in resident person-days fishing and diving |
| No. of recreating visitors Person-days spent visiting Florida Keys | 15% | Visitor reductions not as great as resident reductions |

Changes in the types of visitors seems to have affected reef use

Percent Change from 1995 to 2007

| Item | Percent Change | Comments |
|---|----------------|--|
| Cruise ship visitors as % of all visitors | 118% | From 13% of all visitors in 1995 to 28% in 2007 Believed to have higher participation rates in water-based activities |
| Camping visitors | -64% | |

Planning for replication of 2000-01 socioeconomic study of reefs is underway

- NOAA's Coral Reef Conservation Program funding (FY 2012)
- Scalable plan for implementation in FY 2013 & 2014 (Different project objectives at different costs)



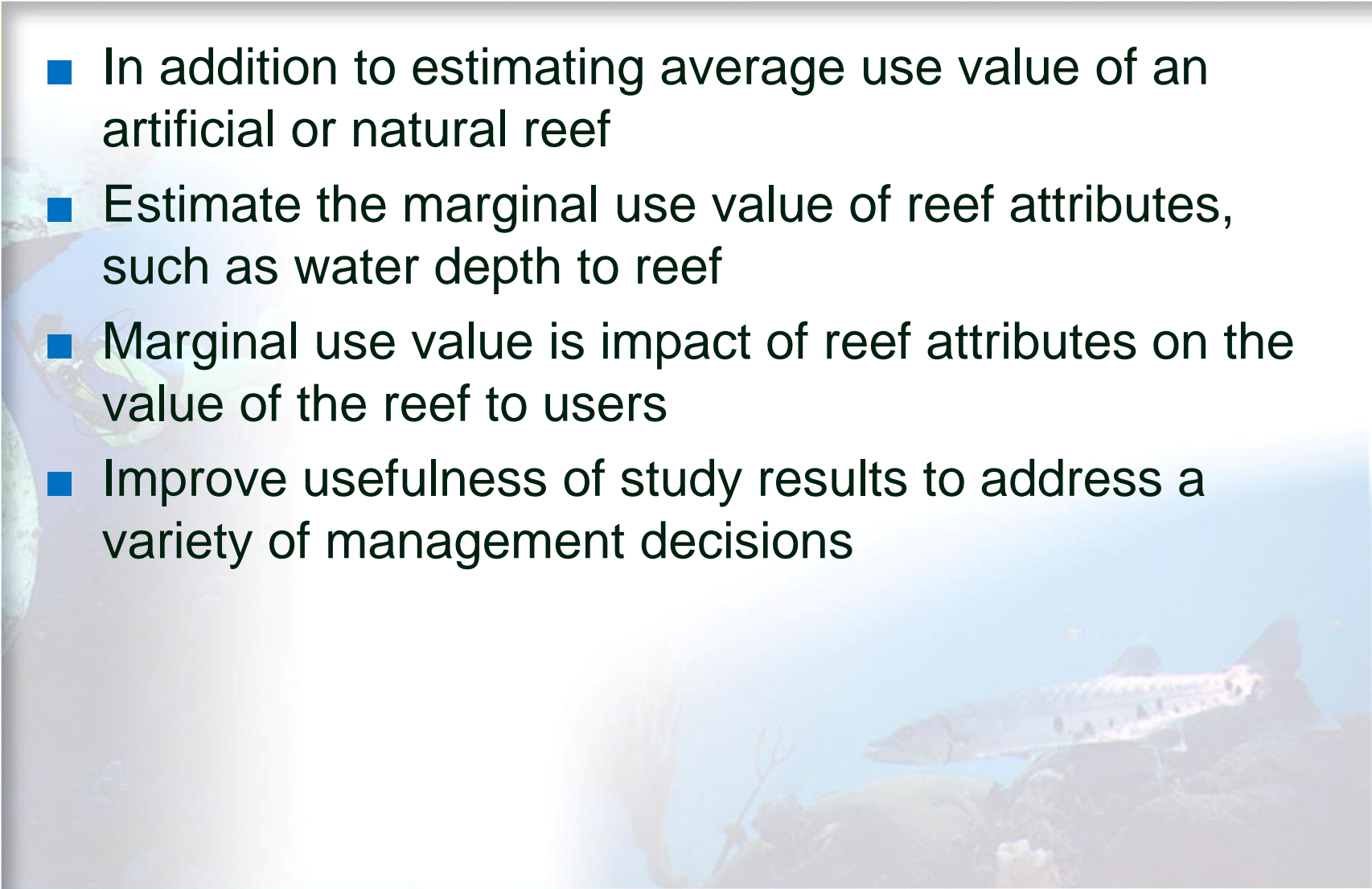
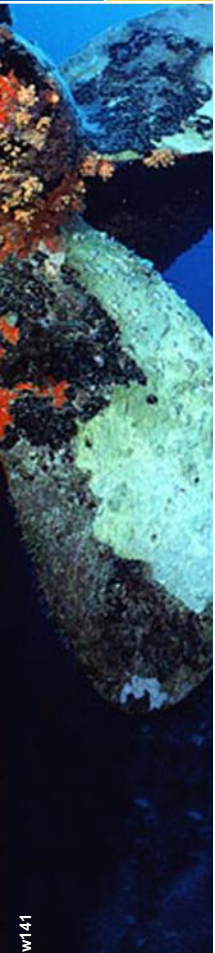
Planning for replication of 2000-01 socioeconomic study of reefs is underway

- Geographic Scope: Martin, Palm Beach, Broward, Miami-Dade, and Monroe counties
- Estimate Use and Economic Value of Use (by county, type of reef, and type of activity)



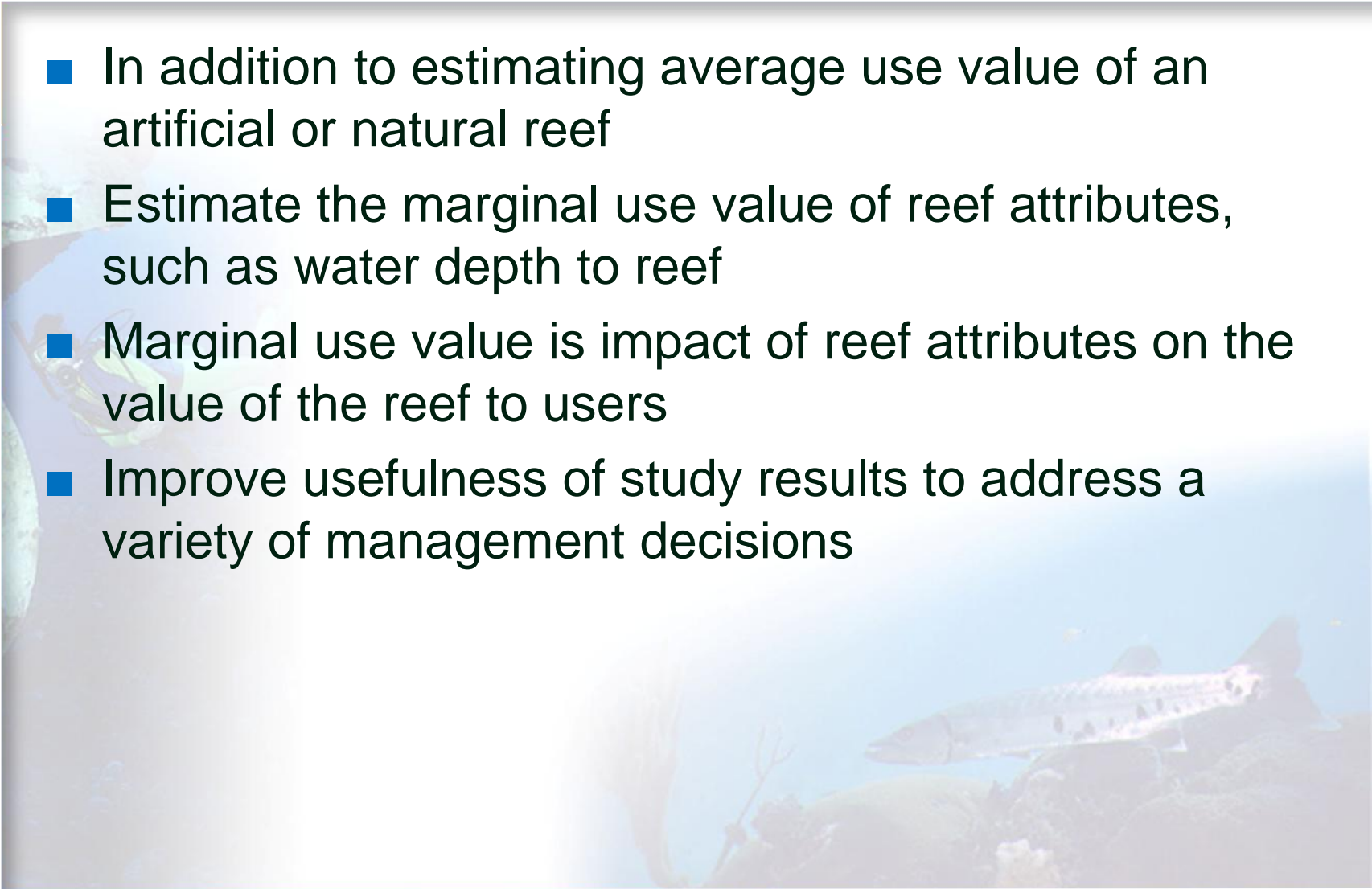
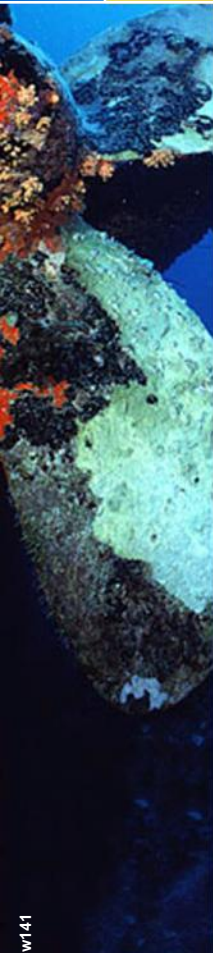
Goal is to add new approach to reef study

- In addition to estimating average use value of an artificial or natural reef
- Estimate the marginal use value of reef attributes, such as water depth to reef
- Marginal use value is impact of reef attributes on the value of the reef to users
- Improve usefulness of study results to address a variety of management decisions



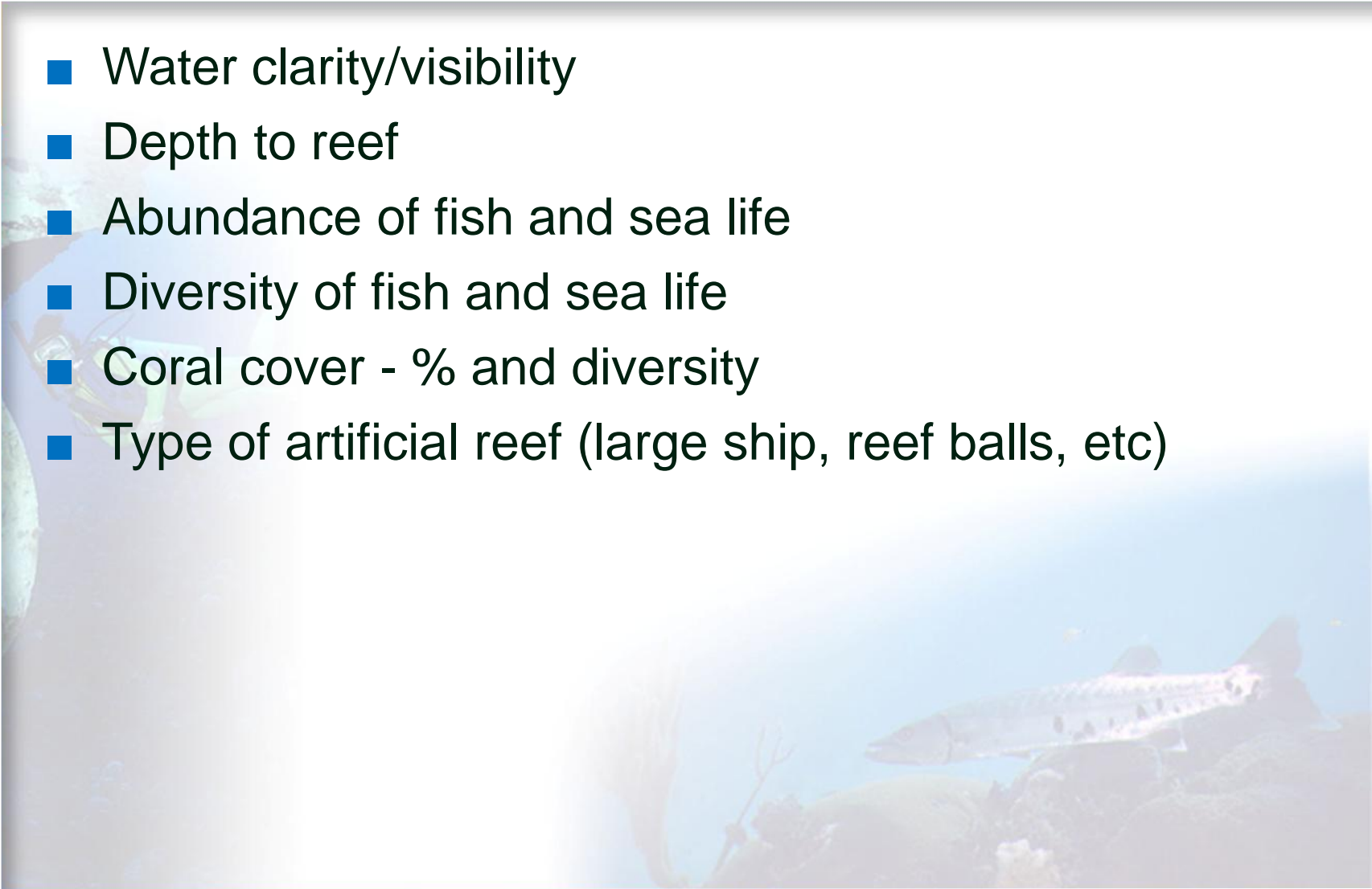
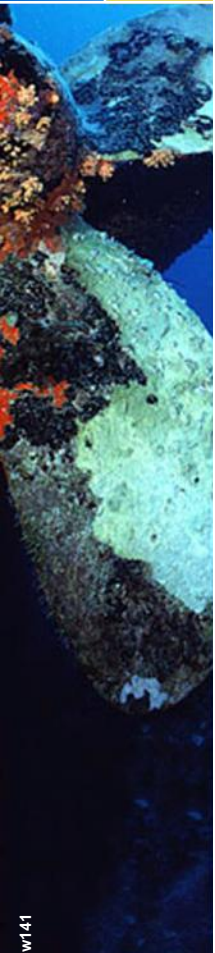
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How does the use value of reefs change with changes in reef attributes

- Water clarity/visibility
- Depth to reef
- Abundance of fish and sea life
- Diversity of fish and sea life
- Coral cover - % and diversity
- Type of artificial reef (large ship, reef balls, etc)



Healthy reefs create jobs and income – documentation is key to create support

- 2001 Socioeconomic Study of Reefs in Southeast Florida needs to be updated
- Dr. Bob Leeworthy of NOAA working with Florida and counties to create plan to update, expand and fund a 2013-2014 study:
 - Person-days of recreational reef use
 - Economic contribution – jobs, income
 - Average use value – existing environmental conditions
 - Change in use value as reef attributes change

