

### **The Emperor Has No Coral—An Inconvenient Truth?**

**Eugene SHINN**\*<sup>1</sup>, Barbara LIDZ<sup>2</sup>, Eugene SHINN<sup>1</sup>

<sup>1</sup>College of Marine Science, University of South Florida, St. Petersburg, FL, <sup>2</sup>U. S. Geological Survey, St. Petersburg, FL

#### The Emperor Has No Coral—An Inconvenient Truth?

High-resolution subbottom profiling, reef drilling, and mapping of benthic habitats along the Florida Keys reef track demonstrate that moribund non-accreting coral reefs outnumber live accreting reefs about 100 to 1, based on reef-tract area. Sub-circular patch reefs restricted mainly to turbid nearshore areas in the lower Keys compose the majority of living/accreting reefs. Linear offshore shelf-edge areas are not accreting, and Holocene coral accumulation during the past 6 ka is generally less than 2 m thick. The thickest accretions consist mainly of coral spurs rooted directly on a Pleistocene unconformity at the platform margin. Less than 2% of Florida reefs have kept pace with the rise in Holocene sea level and are generally located shoreward of the platform margin. Such coral growth, or lack thereof, presents a paradox. Growth rates of all common coral reef species, especially the rapidly growing acroporids, should have kept pace with the well-documented rise in sea level over the past 6 ka. Why did so few reefs keep pace or accrete to present sea level? That Holocene coral growth has experienced setbacks before has been confirmed by <sup>14</sup>C ages of fossil *Acropora cervicornis* fragments that are so common in backreef sands. Carbon-14 data reveal two 500-year periods of non-growth centered on 4.5 ka and 3 ka. The present period of rapid coral demise has spanned only about 30 years. Thus, past periods of non-growth indicate times of environmental crises that predated modern human invasion of the Florida Keys. These observations challenge the highly popular notion that the present declines in Florida, and elsewhere, are anthropogenic in origin.