

Chapter 28

Designing and maintaining a large closed-system reef exhibit at the Georgia Aquarium

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ABSTRACT

Few large-scale, closed-system living-reef aquariums have ever been built, therefore designing the new living reef exhibit at the Georgia Aquarium faced some difficult challenges. The "South Pacific Barrier Reef" exhibit contains 619,920 L, of which 454,250 L is in the exhibit; the remainder resides in pipes and filters. It is 5.5 m deep, and the viewing window is 14 m wide. The reef is created of fiberglass panels erected on fiberglass scaffolding. Platforms within the fiberglass reef hold 5-metric tons of cultured live rock from Fiji. Water circulation is directed from the bottom of the tank, up through the reef and then to a skimmer box. Pressure-sand filters (silica sand) and foam fractionation with ozone, plus activated carbon, are the primary filtration, with a turnover rate of 60 minutes. Two alternating, variable-drive 14.9 x 10³ W (20 HP) pumps move water back and forth across the reef face to create additional water motion and turbulence. Lighting is produced by banks of metal halide lamps in conjunction with an overhead skylight that is 40 % transparent to UV light. After two-years the success of the exhibit has been variable. The fishes are in excellent condition. Coral growth at first was quite good, but then declined in late 2006 due to problems with the artificial lighting system and management of water quality parameters. These issues have largely been resolved and coral growth has improved during 2008.