Underwater photomosaic system  $40,000
Sandin is working to develop a new tool to take large-scale photographs of the underwater environment. The effort comes in capturing many hi-resolution images and stitching them together into one large-format image for analysis. Although the technology exists to solve this problem, Sandin's lab is in need of added resources to completely build a functional version of this system.

Compound microscope and imaging software  $10,000-$20,000
Sandin has a functional dissecting microscope and a basic compound scope for fish dissections and preparations for lab analyses, but lacks a coupled microscope/computer system to modernize his lab, making it much more efficient for graduate students and technicians.

Otolith polishing tools  $9,000
Part of Sandin's fisheries research depends on learning about the life history characteristics of many species of tropical fish. The Sandin lab has an active group studying the age and body-size relationships for a number of species, but their work could be greatly accelerated with more modern equipment. They are in need of a polishing wheel to automate the preparations of otoliths (fish ear bones), a step essential in estimating fish age.

Advanced computing facilities  $15,000
Members of Sandin's lab currently work on individual laptops and desktop computers. They are in need of more advanced computing support to manage the large volumes of videographic and photographic data. Additionally, the large volumes of quantitative data (and tailored statistical analyses) depend on sufficient processing power. Sandin hopes to expand his lab's computing resources to address these pending needs.

In order to advance their marine ecology research, Stuart Sandin and his team of stellar graduate students require additional custom tools and modern equipment.

PARADISE REDEFINED – REVISITING A VANISHING WORLD

How do humans affect coral reef ecosystems?
What makes for a healthy coral reef?

There are almost no pristine or even nearly pristine coral reefs in the world. Reefs once teeming with sharks, large fishes, sea turtles, and healthy corals are all but gone. Impacts such as chronic overfishing, pollution, climate change, and disease have deteriorated these precious ecosystems.

One of the major problems for the conservation of coral reefs is the lack of ecological baselines against which to compare present reefs. Such quantitative baselines can reveal the ecological characteristics that have been lost and can guide scientists toward strategies to restore degraded reefs.

Scripps Oceanography marine ecologist Stuart Sandin and his research team have conducted thorough studies to explore and document the uninhabited coral reef atolls of the Line Islands laced in the vast central Pacific, one of the most remote places in the ocean.

Of particular interest to Sandin is the gradient of human disturbance across the Line Islands archipelago – from uninhabited, pristine reefs to moderately inhabited and anthropogenically impacted ecosystems. Sandin has been using this island gradient to explicitly study the roles that local human activities play in fisheries dynamics and general functioning of coral reef ecosystems. This work in the Pacific is complemented by experimental studies of basic questions of reef ecology and species interactions conducted in various regions of the Caribbean.

In order to advance their marine ecology research, Stuart Sandin and his team of stellar graduate students require additional custom tools and modern equipment.