



Volume 27 · Issue 2, 2011

From the Ocean to Your Home

Marine Fish Nutrition

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Product Feature



Maxi-Jet multi-use water pumps

Welcome to SeaScope!

Welcome to the new digital edition of SeaScope, with the same information-packed issues coveted by marine aquarists everywhere since 1983. Each newsletter will continue to bring you a variety of topical articles, including reviews, product information, practical ideas, important case studies and interesting points of view. It's all meant to keep you in the know and at the forefront of the marine hobby. We hope you enjoy the issue, and welcome your comments and input.

From the Ocean to Your Home: Recreating Nature's Water Movement

Sean Raines, Senior Product Manager, UPG Aquatic

Those who frequent the world's many shorelines are immediately familiar with the sight of crashing waves, the pull of ocean tides and the push of ocean currents. Working in tandem, these forces create our oceans' water movement.

Inherently, ocean water moves. It is not able to stay still, much to the pleasure of thriving underwater ecosystems and ocean inhabitants. In comparison, and without intervention, the water in a reef aquarium remains virtually motionless. In order to replicate the conditions naturally found on a reef, it is necessary to understand the three types of water movement found in nature: steady flow, turbulence and surge. A combination of the three is typically ideal, though the species found in a reef aquarium will dictate how best to orchestrate ideal movement.



A steady, uninterrupted and layered flow of water, sometimes referred to as laminar flow, is smooth, with unidirectional movement that runs in orderly, parallel lines. While it is most easily replicated, on its own laminar flow proves to be ineffectual at producing the types of water movement needed to maintain a healthy aquarium.

are three pumps in one: power head, utility pump and now featuring circulation pump option. Still the best power head for powering undergravel filters and running wave maker timers, as well as running small fountains, calcium reactors and skimmers. New to the Maxi-Jet, the conversion kit in the box to turn the power head into a prop style circulation pump for ultimate water movement inside the aquarium for the least amount of energy. The most fully adaptable pump available!

Events

MACNA 2011

September 9-11, 2011

Hy-Vee Hall

Des Moines, IA

www.macna2011.com

Reef-a-Palooza

October 22-23, 2011

Orange County Fair and

Exposition Center

Costa Mesa, CA

www.reefapalooza.com

Outline

1. Introduction
2. Natural feeding strategies
3. Marine vs. freshwater nutrition
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4. Types of Marine Food
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 - b. Frozen food**
 - c. Live food
 - d. Dry food

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Bringing
the
ocean
home.

Turbulence is a more random and vigorous swirl and flow of water. To sustain a turbulent flow, a constant source of energy must always be at work. It is considered to be the most challenging type of water movement to recreate in aquariums. Even widely-respected scientists and physicists struggle to define how liquids transition from smooth to turbulent states. It is also, however, considered to be the most necessary type of water movement in reef aquariums, as most saltwater dwellers have adapted to expect some level of turbulence.

Surge rounds out the most common labels for water movement types. As its name implies, it is a sudden burst of force, often associated with natural events, as in hurricanes. These strong, yet periodic, surges add another dimension to the conditions found naturally in ocean environments.

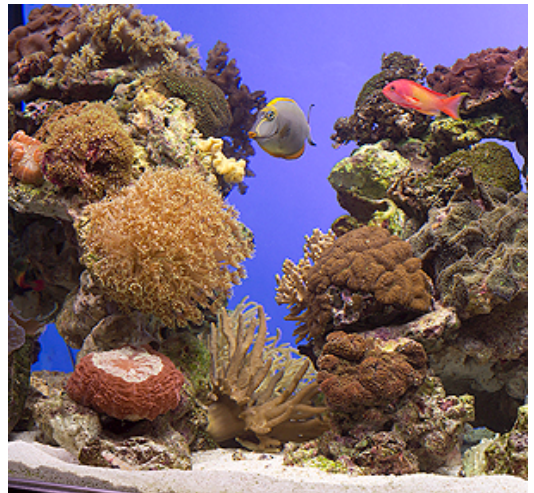
In essence, then, reefkeepers aspire to recreate a piece of the ocean at home. As with any inhabitant of a reef aquarium, proper nutrition, lighting, filtration and water movement are most important to their health, wellness and growth.

Water Movement and Coral

When it comes to establishing an ideal level of currents, one answer does not fit all, especially when it comes to coral. However, proper water movement is essential, and naturally occurring processes - including filtration, aeration and water flow - can all be recreated successfully at home.

Ultimately water movement and filtration not only result in ideal environs, but also prevent the creation of dead spots, or areas in a reef aquarium where water is stagnant. Uneaten fish food, waste and dead algae material collect in these areas resulting in deadly ammonia or ammonium spikes. These dead spots are more likely to occur in corners or near live rock. In addition, this combination of materials may have a devastating impact simply by accumulating on and around coral where it will eventually decay. In an aquarium with optimum circulation, water serves to sweep away detritus while carrying supplies of food to sessile coral species. Thorough and ongoing circulation also perpetuates oxygen-rich environments, while off-gassing carbon dioxide.

Proper planning and commitment are essential qualities when owning a reef aquarium generally, and managing the flow of nutrient-rich water particularly. The needs of each species within an aquarium will define how to create the ideal circulation system. For instance, Spaghetti Leather corals (*Sinularia Flexibilis*) may prefer a stronger flow, which has the added benefit of showing off its many tentacles. Some Mushroom corals (*Discosoma*) prefer a low flow; and because they are hardy, they are often referred to as an ideal starter coral. Research prior to introducing any coral type to a reef aquarium is required.



Replicating Nature's Forces

When it comes to creating an ideal home for marine life, it is critical to strike the right balance of water movement. In the ocean, water moves constantly. For aquariums, reefkeepers must remain vigilant in monitoring conditions and making adjustments in order to encourage a healthy environment.

In an aquarium, water movement is affected by a combination of devices: power heads, pumps and other systems. The ocean does not flow uniformly, and neither should the water in an aquarium. The goal is to find the ideal balance of randomness to meet the needs of varied coral and other aquatic life.

Power heads are rated by the amount of water they move in gallons per hour. With the advent of propeller technology, aquariums may achieve five times the amount of flow, or 125 gallons at 20 times per hour, for the same wattage as used with traditional power heads. An ideal turnover rate in a reef aquarium is 20 to 30 times per hour, though that number may also be dictated by the needs of particular species. This repetitious turning of water is meant to recreate ocean currents, while sending nutrients and oxygen to varied aquatic species.

With the introduction of wave timers, aquariums were able to benefit from a more turbulent flow, which is highly desirable to many reef inhabitants. Using this technology, enthusiasts began experimenting with a combination of devices in an attempt to achieve the right water movement for their particular aquarium.

This frequent experimentation has led to more sophisticated and versatile designs with power head, circulation and utility pump modes, [all built into one system](#). The utility functionality, in particular, offers another layer toward building ideal water conditions. A system with this ability may be used outside of aquariums and is complementary to calcium reactors, refugiums and [protein skimmers](#). In the past, many had to rely on their own do-it-yourself abilities to come up with passable solutions. Today, kits and complete systems make managing water movement less complicated.

Accurately recreating water movement at home not only aids in cleaning and oxygenating water, but also establishing an environment akin to the ocean. Witness a flame angelfish happily swimming against an aquarium's currents or the tentacles of soft coral swaying gently in a smooth flow.

A healthy respect for the ocean will enhance reef aquariums, as well as the health and well-being of its inhabitants.

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A CONTINUING SERIES

Part 4b: Marine Gel Foods and Nutrition

Dr. Hubert Kuerzinger, Senior Scientist Nutrition,
Tetra Global R&D Center Nutrition

Visit www.instantocean.com to read more about Marine Fish Nutrition.

Types of marine foods

There are a variety of different food types available for feeding marine fish, and it is important to make the right choices to ensure

your fish get the balance of nutrition they need.



Frozen food

Frozen foods have traditionally been a mainstay of the diets offered to marine species, whereas most freshwater fish receive them only as treats. One of the great advantages of frozen foods is that they are often more acceptable to fussy fish than [dry diets](#).

A wide choice is available, including Krill, Mysis shrimp, Brine Shrimp, Lancefish, Mussels, Cockles and Seaweed. As a result, a varied diet can be offered. On the downside, frozen foods are not always nutritionally complete (e.g., lacking in certain essential fatty acids, vitamins, etc.), and if they aren't washed before use, can introduce additional phosphorus and organic matter into the water. The latter can be overcome by thawing and rinsing the food before adding it to the aquarium. The use of supplements may help to enhance the nutritional quality of frozen foods, and the fish will also pick up nutrients from food items growing in the aquarium, especially in a reef system. In theory, marine organisms (e.g., Krill) rather than those from other environments (e.g., Brine Shrimp) are more likely to contain the right nutrients.

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