ABOVE: Focus Lighting lit the exterior of the aquarium , which features a 1,000-ft.-long shimmering wall created by environmental artist Ned Kahn. Using wind and reflected light to create a mesmerizing effect reminiscent of ocean waves, the wall is made of over 33,000 aluminum flappers, or small squares that flutter in the wind, and wrap the building's exterior, which is lit with Color Kinetics ColorGraze MX fixtures.

THE WONDERFUL LED ILLUMINATED WORLD OF SHARKS A DELIGHTFUL DIVE

NEW YORK AQUARIUM'S OCEAN WONDERS: SHARKS EXHIBIT
Brooklyn, NY

A million gallons of water and 18 kinds of sharks and rays swimming in tanks with sophisticated LED lighting create an immersive experience at the New York Aquarium's Ocean Wonders: Sharks exhibit. The lighting designer for this project is Christine Hope of Focus Lighting, a New York City-based firm.

The exhibit opened on June 30, 2018 in a three-story, 57,500-sq.-ft. building adjacent to the Coney Island boardwalk, with nine dynamic galleries to help drive awareness of the importance of sharks to the health of the world's ocean and educate visitors about the severe threats sharks face. A secondary goal was to draw attention to the surprisingly diverse and beautiful marine wildlife in New York. The lighting design works to support the exhibit's objective to spread the important message of ocean conservation by establishing an atmosphere that mimics a deep dive through the ocean.

The first tank that visitors experience is a tunnel designed to have the look and feel of a bright and colorful coral reef. Illuminated with Lumenpulse RGBW Lumenbeam Grande LED fixtures, the lighting can be tuned to the exact color quality needed to make coral stand out. "The Lumenbeam Grande fixtures are used for large washes of color over the coral," notes Hope. "Smaller Lumenbeam Medium fixtures have a smaller beam and pinpoint highlights within the reef. It's meant to feel colorful and sun-splashed in a shallow location; the exhibits get deeper as you go along."

The second large tank is a full cylinder that replicates an area of the harbor called the New York Bight, with each species on display native to that area. "We worked closely with WCS to develop the exact color of the water seen when diving in this area at a depth of 60-80 ft. below

THE CHALLENGE:
In an exhibit at the New York Aquarium that was 10 years in the making, one challenge for the designers at Focus Lighting was to convince the client to switch to 100% LED sources instead of the orginally specified metal halide lamps to light sharks and rays in a series of tanks that needed to be visually compelling.

THE SOLUTION:
Based on the decrease in energy consumption, which was an important factor for the client's focus on conservation, and the fact that LED technology came of age as this project neared compeletion, the desgners did a mock up in one of the tanks to show how they could fine tune the colors with the LEDs. They also layered the light to accent the sharks as they swim out of deeper, darker recesses.

PROJECT CREDITS:
Client: Wildlife Conservation Society (WCS)
Lighting Design: Focus Lighting
Architect: ESKW Architects
Exhibit Designer: The Portico Group

PRIMARY FIXTURE LIST:

Location: Exterior	Fixture:
• Exterior LED Shimmer Wall Graze	• Color Kinetics
• LED Steplights at Exterior Ramp	• Bega
Location: Interior	**Fixture:**
• Linear LED Cove Accents	• Color Kinetics
• Interior LED Track Accents	• Juno
• LED Accents at Tanks	• Lumenpulse
• Interior Tapelight Accents	• Luminii

Photographers: Ryan Fischer
Text: Ellen Lampert-Gréaux

In the informative"Meet the Shark" area acrylic shark pendants are edge-lit with cool white Luminii LED tapelight to create a playful environment.

The first tank that visitors experience is a tunnel designed to have the look and feel of a bright and colorful coral reef. Illuminated with Lumenpulse RGBW Lumenbeam Grande LED fixtures to make coral stand out, while another exhibit evokes the New York Bight, an area of the harbor along the coast, and the species found there.

the surface," says Hope. "To create the soft, even glow experienced at that depth, a custom mounting structure was designed and the ceiling above the tank was painted white, so that carefully tuned RGBW floodlights, once again the Lumenbeam Grande, could bounce off the ceiling and into the tank."

Smaller direct accent spotlights, Lumenbeam Medium, are used for contrast of light and shadow, and mounted to the top of the structure to add subtle, natural feeling highlights to the tank. "It's the same strategy here as in the first tank, explains Hope. "Full washes of color create a beautiful emerald green glow, with a paler shade from the smaller fixtures, to create highlights."

The culmination of the exhibit is the Canyon's Edge tank with deep ocean sharks on display. "A few shafts of "sunlight" from cool white Lumenbeam Large LED spots illuminate a narrow strip of sandy beach along the front edge of the tank, then the exhibit falls off into darkness," Hope explains. "The deeper recesses of the huge tank are flooded with blue in the LED Lumenbeam Large fixtures, so that the sharks are just barely visible in the murky depths, and then suddenly come into the light as they approach the front of the tank. We layered the light, so you can see them more clearly when they come into the brighter areas."

Meet the Shark presents information about the sharks. Each display is highlighted by a cluster of tiny LED track heads, low-voltage 3W Juno miniature LED accent lights in the cool white range, mounted to a flexible track curved to match the organic shape of the room. The ceiling is hung with 22 custom-designed "shark

pendants" fabricated in acrylic and edge-lit with cool white Luminii LED tapelight to create a unique and playful environment.

There were several factors in the decision to light the exhibit 100% LED. "This cuts down on energy consumption, which was important as there is a display here about conservation and it was important to us to support that," says Hope. Focus Lighting's principal designer, Brett Andersen adds that this project was almost 10 years in the making and originally called for metal halides. "The LED technology came of age in the meantime, so did a mock up in another tank to convince the client to change over to all LED," he points out. "We love the ability to really fine tune the colors in the tanks, and dial it in perfectly with the LEDs."

The exterior of the building, also lit by Focus Lighting, features a 1,000-ft.-long shimmering wall that uses wind and reflected light to create a mesmerizing effect reminiscent of ocean waves. Created by environmental artist Ned Kahn, the wall comprises of over 33,000 aluminum flappers, or small squares that flutter in the wind, wrapping the building's exterior. Each night, a five-hour lighting program using Color Kinetics ColorGraze MX fixtures illuminates the wall with scenes inspired by ocean life.

The show is automatically triggered as sunset over the beach approaches. As night falls, sunlight is slowly replaced by tones of blue and purple light, ebbing and flowing in a rhythm of bioluminescent tides. "The nighttime look of the shimmer wall was critical to creating the sense of excitement we were trying to achieve with this project," says Hope. "We did a series of mock-ups and ended up with the Color Kinetics fixtures, which provide a beautiful sparkling fluid light feature. The sequence starts on the wall at sunset, as it gets darker the lights increase in intensity... There is a different show almost every night based on the elements."

The parting message is one of conservation, sustainability, and the impact of pollution on our oceans. A "Pepper's Ghost" effect simulates garbage floating in the "Canyon's Edge" tank, while brightly lit interactive displays encourage guests to learn about responsible practices before returning to Coney Island's boardwalk.

"We want to encourage reducing pollution, so there is window that looks back into the Canyon's Edge tank from the next room, with TV monitors showing floating pieces of trash, but reflected in the tan," says Hope. "The main objective of the exhibit is to spread the important message of ocean conservation. We have achieved this with exhibits designed to reduce fear and increase understanding of every aspect of a shark's world, while fostering a sense of awe and enchantment with ocean life." ●

ABOVE: The deeper recesses of the "Canyon's Edge" shark tank are flooded with blue in the LED Lumenbeam fixtures (top photo), so that the sharks are just barely visible in the murky depths, and then suddenly come into the light as they approach the front of the tank. The bottom photos illustrate the clusters of LED track heads—low-voltage 3W Juno miniature LED accent lights in the cool white range—mounted to a flexible track curved to match the organic shape of the "Meet The Shark" room.