

AAPG

# EXPLORER

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## **Dangerous Beauty** Geology and ancient secrets at the Straits of Hormuz

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*Oman's Musandam Peninsula offered challenges*

# 'Adventure Scientists' Explore Remote Regions

By **SUSAN R. EATON**, EXPLORER Correspondent

**A** APG member Simon Donato and his adventure science colleague freely admit they got “cliffed out” while inching along a limestone precipice – encrusted with goat poop and strewn with loose rocks – that measured 24 inches at its widest and eight inches at its narrowest.

Falling was not an option. The rugged limestone mountains of Oman's Musandam Peninsula plunge 500 meters to the waters of the Persian Gulf. Carnivorous in nature, the fossiliferous Cretaceous age limestones shed hands, skin, even running shoes, on contact.

The Musandam Peninsula juts out into the Strait of Hormuz, a strategic body of

water that stretches 55 kilometers from Oman to Iran.

Yes, the same Strait of Hormuz where earlier this year Iran's navy flexed its muscles, threatening to block the passage of oil tankers carrying a significant portion of the world's oil supply.

In the end, Donato and his colleague turned around, leaving the goat trail to the goats. They retreated to the peninsula's ridge line, with its commanding views of the Persian Gulf, traveling along barely discernable trails left by people who had likely vanished centuries ago.

It all occurred last March, as Donato and two team members mounted an “adventure

science” expedition to the Musandam Peninsula – their mission was to investigate undocumented archaeological sites and to explore for evidence of paleotsunami deposits.

What, you might very well ask, is “adventure science?”

The concept was developed by Donato to solve and explore nature's mysteries.

“Adventure science is about getting outside, exploring the world, and understanding nature in a scientific way,” said Donato, a Calgary-based geologist with Esso Resources Canada Ltd. who holds a doctorate from McMaster University. Donato treads lightly, with a low carbon

footprint, relying upon manpower to access and explore remote regions of the planet.

“Being a field scientist is not about being able to do math in your head – it's about observational skills,” Donato said. “We're a resource for data collection in poorly studied areas, primarily because they're tough to get to.”

Adventure scientists, he continued, trade hiking boots for nimble trail runner shoes, and can cover tens of kilometers in a day. Skilled at quickly conducting regional reconnaissance, adventure scientists pass their field notes, GPS locations and digital photographs to experts who determine, in the field or at a later date, whether follow-up scientific or archaeological investigations are warranted.

“The athletes bring mental and physical toughness, endurance, durability and speed,” he said. “And the experts coach the athletes to look for specific attributes or indicators.”

### A Daring Challenge

A man on the run, Donato, 35, is a tall and lean endurance athlete. Last year, he bowed out of a 330-kilometer-long, non-stop mountain race in Courmayeur, Italy, after he sprained an ankle at the 150-kilometer mark. In fact, he pushed onward, to the 172-kilometer mark, before stopping to avoid long-term physiological damage.

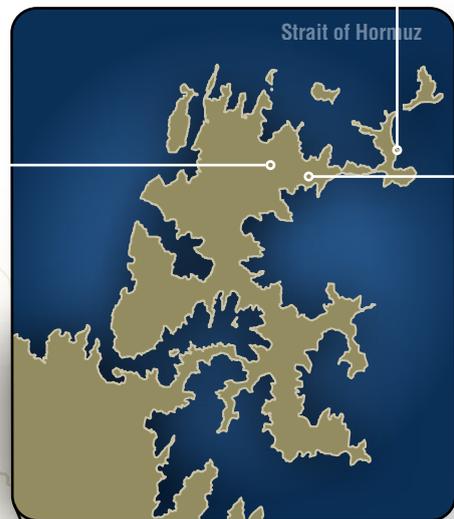
Donato also is a man who runs toward a challenge: While reviewing a geological report by R.L. Falcon, detailing a 1971 expedition sponsored by the Royal Geographic Society of London to map the oil and gas potential of the Musandam Peninsula, Donato was struck by one of Falcon's sentences:

*“We were told of archaeological sites in the interior, but the terrain was far too mountainous to explore; therefore, we did not visit them.”*

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Photos courtesy of Jim Mandelli



**A** – The view east from “Macchu Pichu” is nothing but open ocean; this is the last piece of land before a mariner would enter the Gulf of Oman and Indian Ocean.

**B** – Donato makes his way down the steep and loose rock wadi (“380 meters of terror”) after getting “cliffed-out” crossing the isthmus.

**C** – A large graveyard preserved on one of the interior plateaus near one of the ancient villages. There were several hundred graves.



Formerly irrigated fields (water transported along muddied stone walls visible) next to ruined structures on a plateau bounded by a vertical drop of several hundred meters. Cloud-capped mountains in the distance belong to the isthmus connecting our starting point to the peninsula.



Rothaus and Donato resting at Camp 2, and drying wet gear. The adventure scientists were surprised to discover that the uninhabited beaches were covered in plastic bottles and other flotsam discarded at sea by mariners.

## Expedition from page 12

Unknowingly, Falcon had thrown down the gauntlet; 40 years later, Donato accepted the challenge. The Musandam Peninsula, a formidable natural fortress of rock with no roads or inhabitants, was a perfect candidate for an adventure science expedition.

Donato, a Fellow with the New York-based Explorers Club, led "Beyond Roads: The Musandam Peninsula Oman Expedition" from March 5-20, 2011. The three-man expedition carried the Explorers Club Flag #71 to Oman.

The team arrived during the Arab Spring uprisings, and tensions had spilled into Oman. The initial meeting with the Omani boat captain went badly, and he warned the team: "Foreigners are not allowed to travel there – it's patrolled from the air."

The boat captain's parting words – before he quit – were: "If somebody finds you, it's bad for you, and it's bad for him."

Luckily, the team found a replacement who ferried them, their gear and 80 liters of water to the remote tip of the Musandam Peninsula.

### High Way to the Danger Zone

Apart from falling, health risks on the trip included sunburn, dehydration and bites from venomous vipers, scorpions and camel spiders. The team carried a satellite phone for emergency communications.

Richard Rothaus was one of Donato's team members. Rothaus, president and principal archaeologist of Trefoil Cultural and Environmental LLC in Sauk Rapids, Minn., confirmed that he's not an endurance athlete – nor was he the colleague stuck on the goat ledge with Donato.

After an arduous day of shuttling 50-liter backpacks full of supplies and water – and climbing 200 meters with no trails to speak of, in 30-degree C temperatures – Rothaus elected to camp at lower elevations, acting as the resident archaeology expert while Donato and the third team member, Jim Mandelli, an engineer and elite athlete from Vancouver, British Columbia, conducted 50 kilometers of reconnaissance in 10 days.

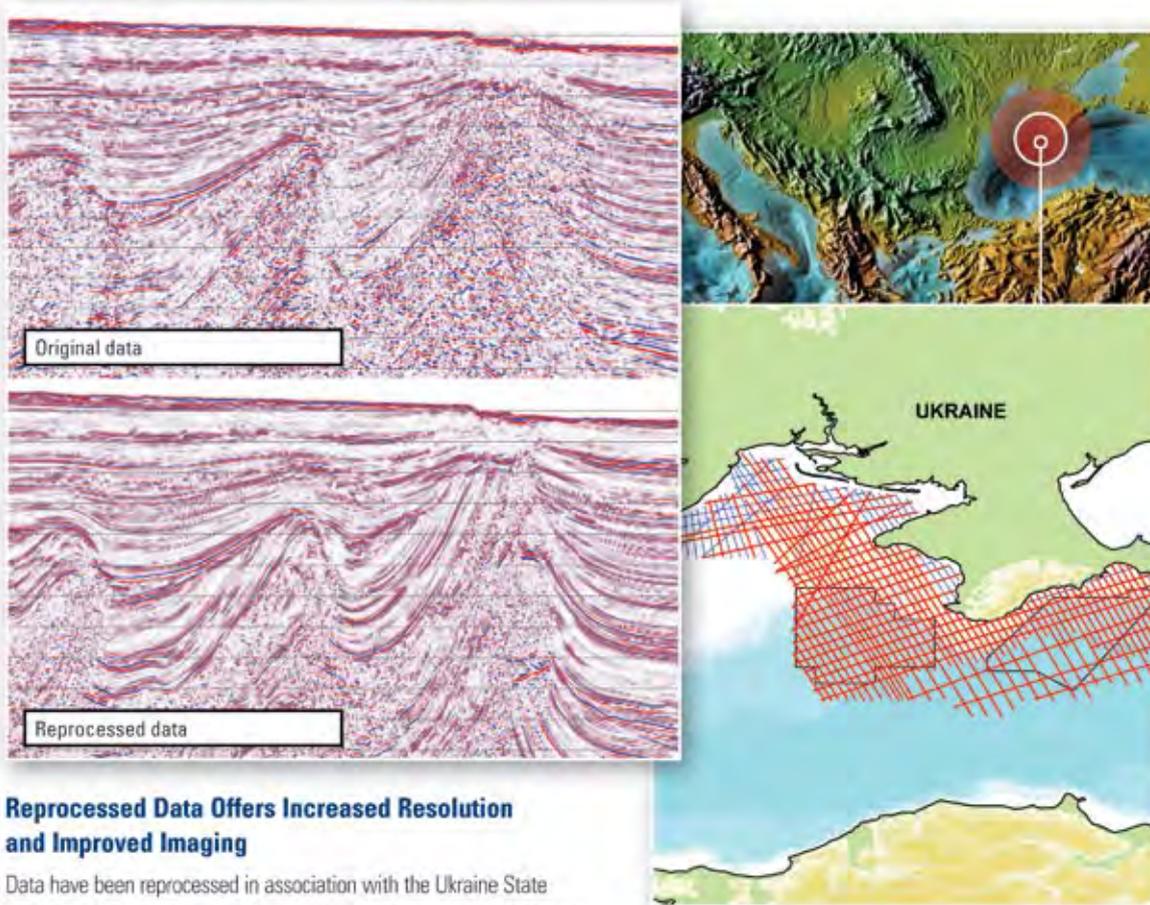
Daily rations, per person, consisted of 2,500 calories, placing team members in a caloric deficit based upon their exertion levels. Each man had a daily allocation of three liters of water, which included cooking water.

Due to the area's remoteness and a nagging concern that the boat captain

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## HoD to Consider Classifications

Delegates will consider three proposals at the House of Delegates meeting at the AAPG Annual Convention and Exhibition in Long Beach, Calif.

Two of the proposals deal with change of membership classifications.

House Chair Jeff Lund said the proposals were generated from the HoD Constitution and Bylaws Committee, chaired by Dave Entzminger.

The membership classification proposals are:

- ▶ Membership Simplification Proposal.
- ▶ Membership Class Solution Proposal.
- ▶ Delegates will also consider a

Strategic Plan Amendment proposing "any recommendations to the Executive Committee involving potential amendments to the Constitution and Bylaws shall also be forwarded to the House of Delegates for review and comment."

Both of the membership classification proposals address the present member classifications of the Association (Active, Emeritus, Honorary, Student and Associate) with the aim of simplifying and clarifying the classification scheme.

The C&BLC voted unanimously at its meeting to present both proposals at the Long Beach meeting for delegate discussion of both proposals.

Both proposals are forwarded without

endorsement from the C&BLC.

After discussion on the House floor, an informal vote could be solicited from the delegates to establish which proposal or parts of the proposals, if any, the House would endorse.

The C&BLC would then rewrite the appropriate sections of the bylaws needed to follow the House's endorsement and bring it to a formal vote in 2013.

The proposals have been sent to delegates and are published online. The specific proposals and a discussion area are accessible from the AAPG website front.

Member comments are invited. 

## Danger Zone

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archaeological excavations, which could include carbon dating.

"There was such a unique ecological niche on the plateaus," Rothaus said, "because habitation only worked when the climate was wetter and cooler than today." The presence of cisterns and irrigation systems, he said, indicated that although life was tough, people farmed on the Musandam Peninsula before the climate changed.

According to Rothaus, it's always good to have a dual-purpose expedition. The peninsula's rocky coastlines – and a corresponding lack of readily accessible beach sediments – prevented the team from investigating evidence of paleotsunami deposits.

No stranger to Oman's geology, Donato's doctorate work involved three field seasons of studying paleotsunami deposits in the Sur Lagoon located 200 kilometers south of Muscat, Oman's capital city.

"In the world of tsunamis," 'paleo' refers to anything that's buried and that we don't have historical records for," Donato said.

In the early- to mid-2000s, Donato, his doctorate thesis adviser and Rothaus worked on a Vibracore project, searching for sediments of "tsunamigenic" origin. The team mapped a laterally extensive shell horizon, greater than one square kilometer in size, which extended deep into the lagoon.

The five- to 25-centimeter-thick horizon contained numerous sub-tidal and offshore bivalve species, including many articulated shells.

The bivalve horizon they mapped correlated with an 8.1 magnitude earthquake on Nov. 28, 1945, which was focused in the eastern portion of the Makran Subduction Zone of the Arabian Sea. The earthquake generated a powerful tsunami, causing destruction in Pakistan, India and the city of Muscat.

Donato's doctorate work demonstrated how low cost, geological investigations can be used – for risk assessment purposes – in coastal areas with a history of seismic activity but no documented paleotsunami record.

### Your Own Back Yard

In order to protect the settlements from looting, Donato and his team haven't published the coordinates of their study area.

(A full report of Beyond Roads: The Musandam Peninsula Oman Expedition can be found on the New York Explorers Club website, under the Flag Report section:

[http://www.explorers.org/pdf/Flag\\_71\\_-\\_Simon\\_V.\\_Donato\\_Flag\\_Report\\_7-19-11.pdf](http://www.explorers.org/pdf/Flag_71_-_Simon_V._Donato_Flag_Report_7-19-11.pdf).)

However, they've provided all of the expedition's findings to the Omani government.

"The good news," Rothaus said, "is that the area is remote and it's not under immediate threat."

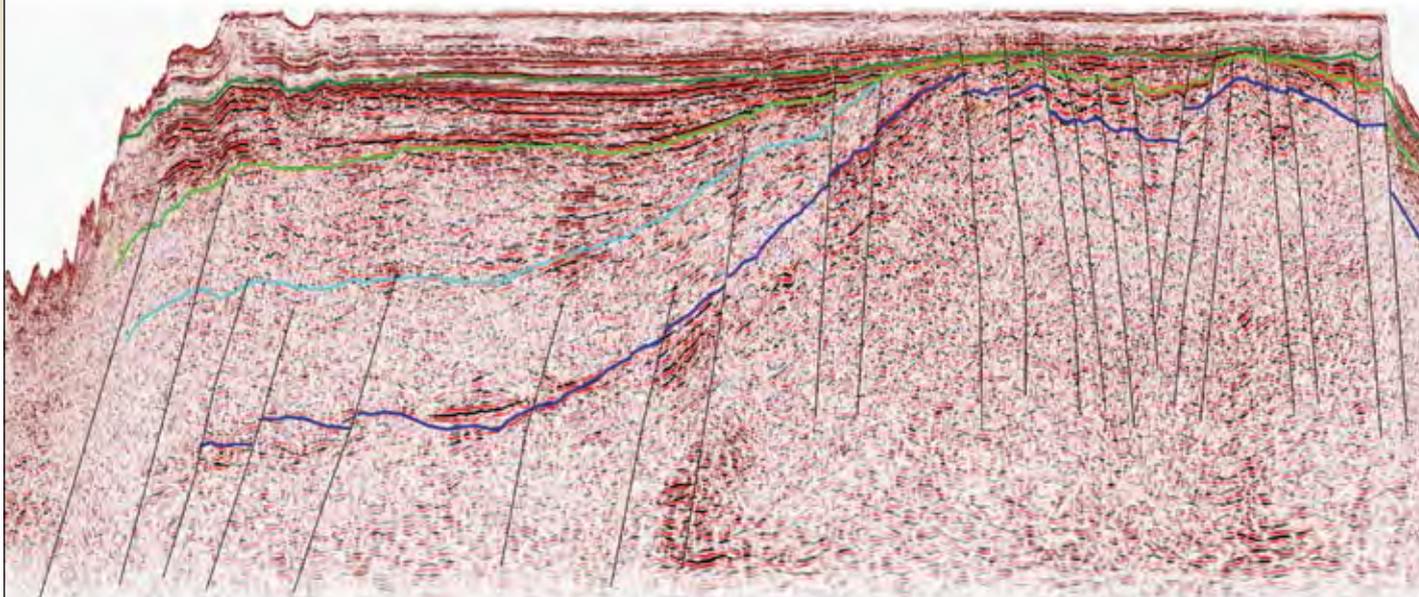
Donato has replaced his trail runners, which, by the end of the Omani expedition, were held together by electrical tape.

He challenged fellow geoscientists to lace up their running shoes, to practice their art of field observations and to make new discoveries in their own back yards or in the most remote regions of the planet.

"Geologists are a rare breed, and they make good adventure scientists," he said.

"We have an appreciation for the natural world and for landscapes, and we're endowed with a sense of curiosity." 

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