

Strytan

Diving Iceland's Hydrothermal Vents

Text and photos by Michael Salvarezza and Christopher P. Weaver



The waters of the Eyjafjordur Fjord were still and calm. There was a sharp crispness to the air and snow covered the hills lining the shore. Except for the gentle lapping of water against the sides of our inflatable dive boat, the world around us was silent. To the north we could see heavy gray clouds hanging low to the horizon, the first signs of an approaching storm undoubtedly born in the Arctic wilderness just a few miles away. In a few short hours, the weather would turn bad and diving would become impossible. For now, all was calm and we were focused on preparations for an underwater adventure to an alien world.



In 1997, divers Erlendur Bogason and his friend Árni Halldósson discovered an amazing hydrothermal vent in the dark waters off the shores of Hjalteyri, a small fishing village located near the town of Akureyri. Strýtan, as this location has been named, is a towering chimney-like geological forma-

tion rising to over 200ft (230m) from the ocean floor to nearly 50ft (15m) below the surface.

Hydrothermal vents have been discovered in many places throughout the world, usually along continental rift zones, but they are generally located many thousands of feet

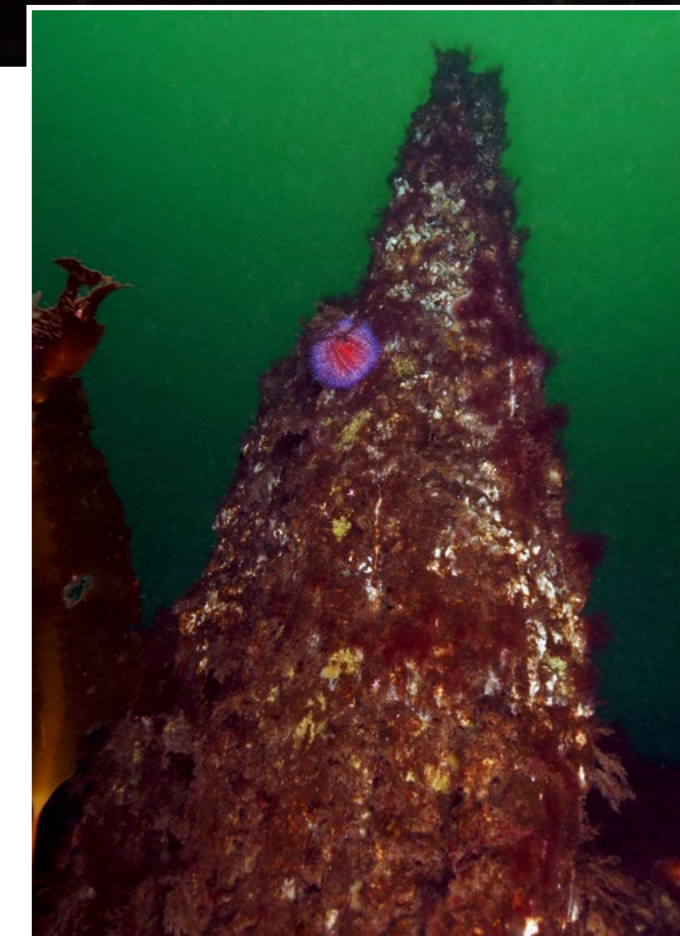
deep. Currently, Strýtan is the shallowest known vent in the world and the only place where scuba divers can actually dive on an active hydrothermal vent. A white smoker, Strýtan is a set of chimneys that continually emit very hot water 167°F (75°C) at an estimated rate of 26 gallons (100 liters)

per second.

These geological formations are formed by smectite, a white clay material that mixes with other crustal elements and minerals as it circulates through the oceanic crust under very high pressure and temperature. When this material mixes with the cold



CLOCKWISE FROM FAR LEFT: Divers exploring Strýtan's vents; Hot water emerges from Strýtan at an astonishing rate; Dramatic scenery at one of Iceland's fjords; Strýtan's chimney



ocean water after emerging from the ground, it coagulates, hardens and forms the chimney. Strýtan started forming at the end of last ice age 10,000 years ago.

At Strýtan, divers can explore these towering formations and will marvel at the marine life that abounds in these waters.

Diving

Our dive began with a routine back roll into the teeth-chattering 34°F (1°C) water. Instantly, our eyes adjusted to the dim light of the greenish-black water. Peering down through 50ft (15m) visibility and searching for something to orient ourselves, we focused first on the down line.

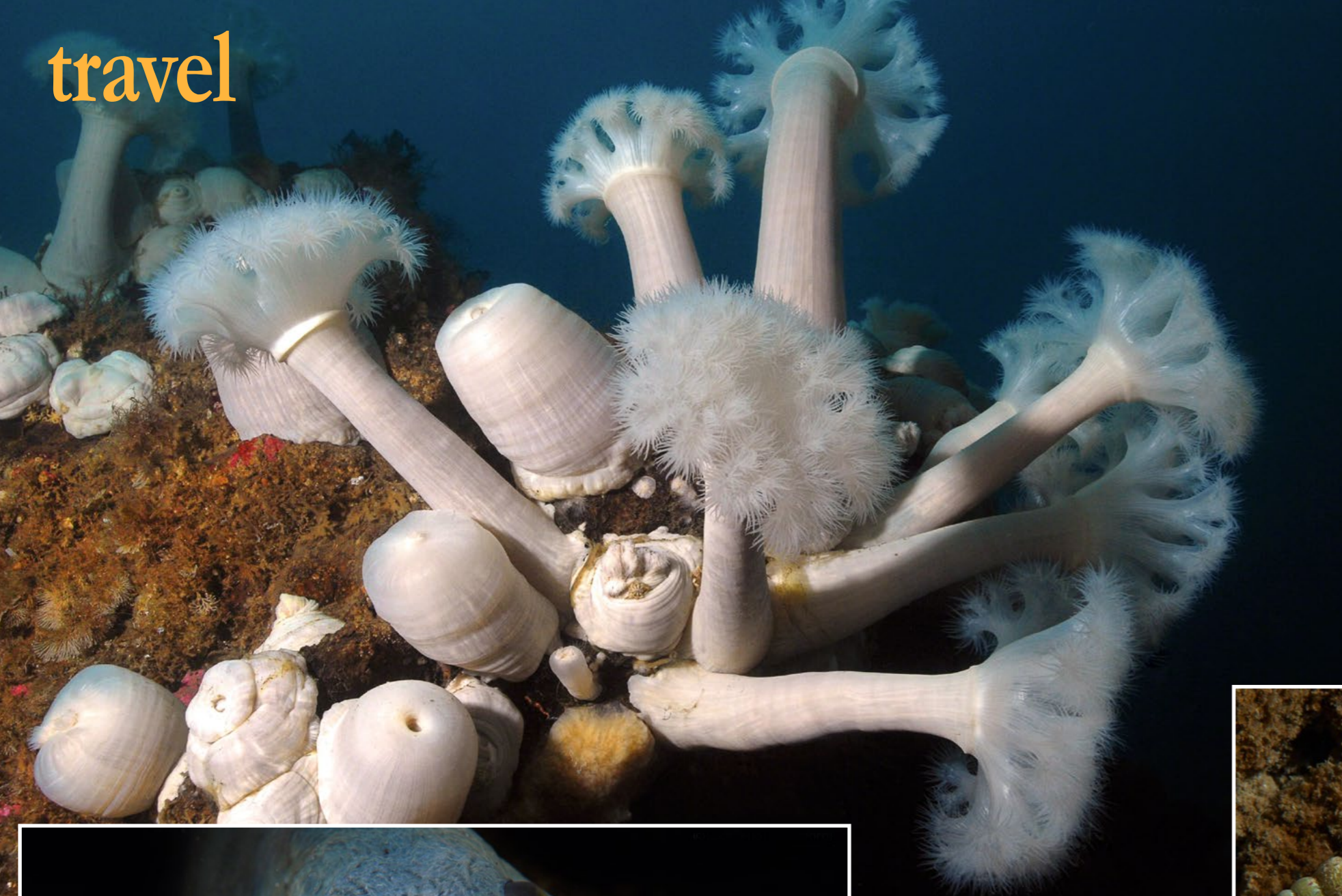
Bogason, who operates the nearby Strýtan Divecenter, has

installed a mooring buoy to ensure the protection of this delicate environment and to help divers find their way to the site. Descending into the waters of the fjord, our eyes opened wide as the first glimpse of the chimney came into view.

At first, Strýtan appears as a tall, narrow spire—rocky, covered with multi-colored plumose anemones, but otherwise somewhat uninteresting... until you get close.

After just a few minutes, we became aware of hazy, "out of focus" water—the telltale sign of hot fresh water mixing with cold salt water. These haloclines and thermoclines were easy to spot and were the best evidence of the rushing geothermal water flowing into the fjord. Scientists





CLOCKWISE FROM LEFT: Ferocious looking but harmless wolffish; White-plumed anemones decorate Strýtan's chimneys; Weird-looking lumpsucker; *Flabellina sp.* nudibranch; Hermit crab

studying this phenomenon estimate that the water emerging from the cone is about 1,100 years old.

Normally, divers in very cold water never remove their gloves—but at Strýtan, things are a bit different! Divers here can carefully remove their gloves and warm their hands in the hot water flowing out from the cone—a unique method of hand warming on a cold-water dive!

Marine life and protected areas

In addition to geological marvels, Strýtan is

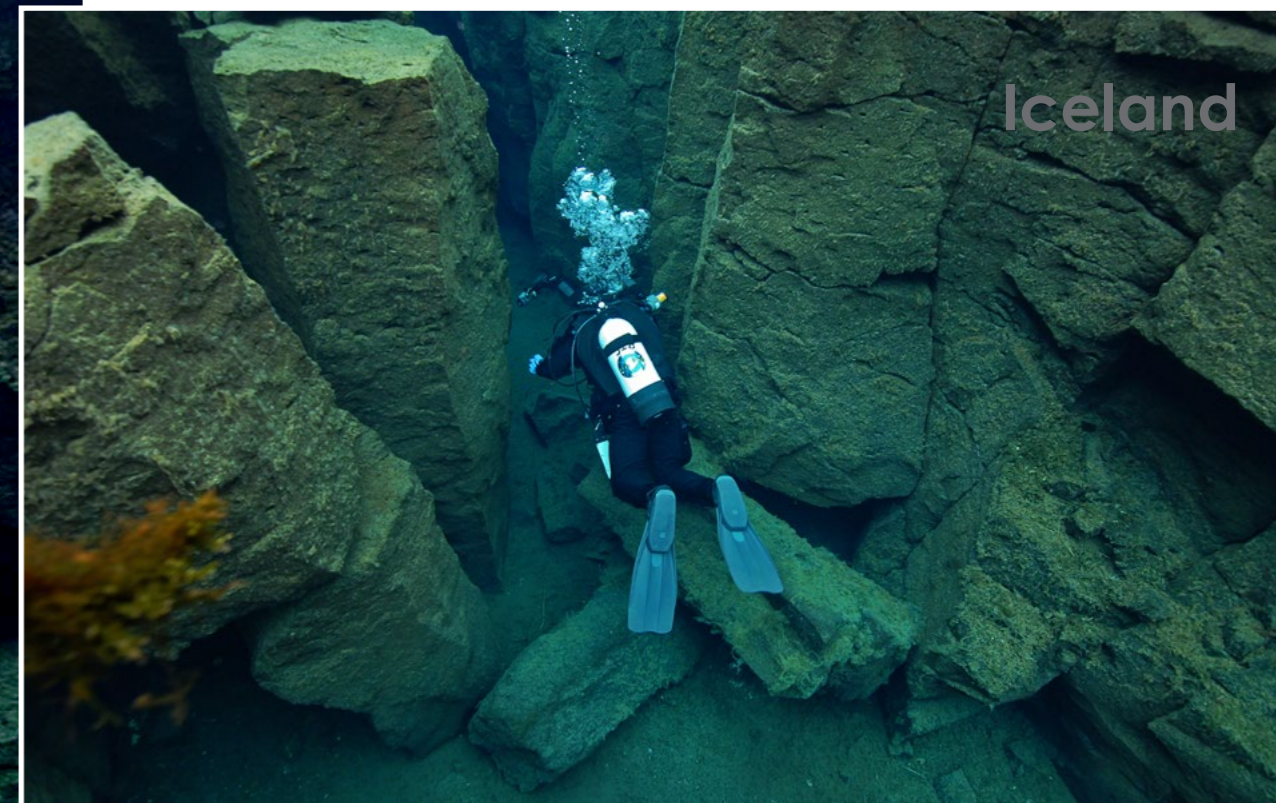
home to a wide array of interesting marine life. Macro enthusiasts will spot colorful *Flabellina sp.* nudibranchs, along with crustaceans, sponges, starfish and anemones. Swirling around the chimneys are schools of cod and pollock. Sharp-eyed divers will also encounter starry rays, the curious lumpsucker fish and the ferocious looking wolffish.

Strýtan is the first protected underwater area in Iceland, gaining this status in 2001. This unique location has received world-wide scientific attention as well as being

filmed by Bogason for National Geographic. Despite the rugged appearance, it is actually a fragile environment. Careless divers who don't pay attention to proper buoyancy can quickly damage rock formations that have taken thousands of years to form. Visitors are strongly advised to be careful and respectful.

Nearby in the same waters are other dive sites worth visiting.

Arnarnestrytur, sometimes referred to as "Little Strýtan", is a cluster of smaller hydrothermal vent cones covering an



Iceland

Nesgla underwater (left); Diver explore the famous Silfra fissure (above)

This water, filtered for 50 years through miles and miles of lava rock, emerges here as clear and clean as possible. It is here that divers can visit

Silfra, one of these geological cracks and one of the most iconic dive sites in all of Iceland.

At Silfra, divers descend a set of



area 1,312 feet (400m) by 3,281 feet (1,000m) with an amazing variety of marine life. Arnarnesstrýtur was protected in 2007 and became the second protected underwater area in Iceland.

The French Gardens is a sublimely beautiful, though rarely visited site consisting of additional cones and vents.

Additional adventures

Diving in Northern Iceland is a unique adventure. Here, divers can experience the wonders of Earth's geological forces by visiting the underwater hydrothermal vents or by diving in Nesgla, a crack or fissure in the Earth's crust formed through tectonic activity

and flooded with water of unbelievable clarity. Opportunities also exist to dive with spawning cod fish in early April, and to experience diving sea birds off Grimsey Island, a small island north of Iceland and located right on the Arctic Circle. In the harbor near Akureyri, the wreck of the *Standard* lies in shallow water. A German bark, *Standard* was built in 1874, sunk in 1917 and discovered in 1997.

Two hours outside of Reykjavik is Thingvallavatn Lake, home to a ruptured landscape torn apart by geological forces. In and around the lake are many fissures and tectonic cracks, many of them filled with glacial melt water from Iceland's second largest glacier, Langjokull.



Dramatic views from the road through Northern Iceland; Comb jelly in frigid waters of Northern Iceland (left)





Divers enjoy crystal clear water in Silfra (left and top right); Dramatic waterfalls adorn the Icelandic landscape (above)

stairs installed for safety and access, and then enter a labyrinth of rock walls, boulder piles, cavities and crevices all filled with some of the world's purest water. In fact, divers are encouraged to taste the water along the way!

Unique to Silfra, divers can actually reach out and simultaneously touch both the North American and Eurasian tectonic plates. Diving here is akin to being transported to another world—with visibility exceeding 300ft (91m), temperatures hovering around 34°F (°1C) and a gentle flowing current, the dives are magical and transformative.

Northern Iceland boat harbor (left inset); Sea urchin (above inset)

canoes, the land is relatively young and is still being formed. It is also a country steeped in history, including strong cultural ties to the Vikings, and is home to the

site of the very first Parliament meeting in the year 930 AD.

In fact, visitors can experience the most exciting natural attractions Iceland has to offer in one afternoon by taking the Golden Circle tour. The Golden Circle is a very popular tourist route covering about 186.4 miles (300km). The tour loops from Reykjavik into central Iceland and back again.

There are a number of tour companies that offer this tour, most of which offer

Topside wonders

Topside, Iceland is an amazing contrast between civilization, history and wilderness. With only 320,000 people residing in the entire country, many of them in the main city of Reykjavik, much of the country's landscape is natural and undisturbed. Visitors can experience black, barren fields of pumice and lava stone, breathtaking waterfalls, lovely seaside communities and dramatic mountains.

Home to more than 30,000 live vol-



ICELAND INFORMATION

GETTING THERE: International visitors arrive in Iceland into Keflavik Airport. Most passengers do not require a visa to enter Iceland as long as their stay does not exceed three months. Transport to other regions in Iceland can be accomplished either by driving or through domestic air travel. There are domestic airports in Reykjavik, Akureyri and several other towns. Drive time from Reykjavik to Akureyri is 4-5 hours, while air travel is 45 minutes.

BAGGAGE: Baggage allowances vary for each international carrier, so check before you leave! Note: Some international carriers are now enforcing weight and size limits for carry-on bags as well as what is considered a personal carry-on type of bag.

WEATHER: Iceland lies on the edge of the Arctic and, at its northernmost point, is only 30 miles south of the Arctic Circle. Accordingly, the winters are long, generally from September to April. In the depths of the winter, daylight is almost nonexistent and in the summer the days are almost 24 hours long. However, due to the moderating influence of the Gulf Stream, winter weather in the south can be milder than in New York or Zurich. Winter is harsher in the north, with fierce storms, wind driven snow and low temperatures. Temperatures are the lowest in the highlands.

CURRENCY: The local currency is the Icelandic Krona, but U.S. dollars and Euros are often accepted.

ELECTRICITY:
Voltage: 220-240V/50Hz
Primary Socket Type: Europlug, Schuko
Travel Adapter: Round pin universal plug

the following highlights: National Park Þingvellir, Gullfoss Waterfall, Strokkur Geysir and Kerid Volcanic Crater Lake. Some tours may also include trips to The Blue Lagoon, Skálholt church, and the Nesjavellir geothermal power plant.

Afterthoughts

If you are an experienced cold-water diver in search of underwater geological adventures, put northern Iceland

high on your list. Where else can you take a thermos on your dive, fill it with hot, geothermal water, and make some hot chocolate with 1,100 year old water with it before returning to the dock? ■

The authors wish to thank Dive.IS (dive.is) and Strytan Dive Center (strytan.is).

Michael Salvatore and Christopher P. Weaver are underwater photog-



raphers based in New York. For more information about this and other expeditions, visit: ecophotoexplorers.com/iceland.asp



fact file



Iceland



SOURCES: US CIA WORLD FACTBOOK, XE.COM, US TRAVEL.STATE.GOV, LONDONDIVINGCHAMBER.CO.UK

History In the period between the late 9th and 10th centuries AD, Celtic Irish and Scottish people as well as Norwegian immigrants settled in Iceland, which is home to the world's oldest legislative assembly, established in the year 930, called the Althing. For 300 years, Iceland was independent until Norway and Denmark took over ruling the land. In 1875, fallout from the Askja volcano caused economic devastation and widespread famine, leading to a fifth of the nation's population emigrating to the United States and Canada. In 1874, Denmark granted limited home rule. By 1944, Iceland was independent once more. The fishing industry drove economic growth in the latter part of the 20th

century, but diversification of the economy followed Iceland's joining of the EU in 1994. The country was particularly hard hit by the 2008 economic crisis. Iceland ranks among the highest in the world for longevity, literacy and social cohesion. Government: Constitutional republic. Capital: Reykjavik

Geography Iceland is located in Northern Europe. It is an island which lies northwest of the United Kingdom, between the North Atlantic Ocean and the Greenland Sea. Coastline: 4,970km. Terrain: Iceland is comprised primarily of plateau scattered with mountain peaks and icefields; fjords and bays deeply indent the coast. Lowest point: Atlantic Ocean

0m. Highest point: Hvannadalshnukur 2,110m (at the Vatnajökull glacier). Natural hazards include earthquakes and volcanic activity.

Economy With a Scandinavian-style social market economy, Iceland mixes free-market principles and capitalist structure with a broad welfare system. Before the 2008 economic crisis, there was low unemployment and high growth with an even distribution of income. The main industry is fishing, however declining fish stocks and changes in world prices for fish and fish products, ferrosilicon and aluminium, has spurred the country to diversify into service industries and manufacturing, with specific development in tourism, biotechnology and software production. In addition, oil exploration off Iceland as well as abundant hydropower and geothermal sources are attracting foreign investment in the aluminium sector, boosting economic growth and luring high-tech firms to establish cheap green energy cen-

ters there. Domestic demand has boomed after rapid growth in the financial sector, however the 2008 crisis lead to several banks collapsing forcing the nation to procure 10 billion in loans from the IMF and other countries in order to stabilize the krona. Other challenges include implementation of capital controls, reducing the budget deficit, reigning in inflation, decreasing high household debt, financial sector restructuring and increasing diversity in the economy.

Currency Icelandic kronur (ISK) Exchange rates: 1USD=131.45 ISK; 1EUR=150.14 ISK; 1GBP=200.94 ISK; 1AUD=102.46 ISK; 1SGD=97.67 ISK

Population 317,351 (July 2014 est.) Ethnic groups: Icelanders are a homogeneous mix, descending from the Norse and Celts 94%; foreigners account for 6% of the population. Religions: The official church is the Evangelical Lutheran Church of Iceland with 76.2%, Roman Catholic 3.4%, other churches and religions 9.6% (2013

est.) Internet users: 301,600 (2009)

Language

Icelandic, English, Nordic languages; German is widely spoken.

Visa

A passport valid for 90 days is necessary for visitors, with the exception of citizens of Denmark, Norway, Sweden and Finland. Schengen visas for Iceland can be attained through the Danish embassy.

Citizens of the United States may enter the country for up to 90 days without a visa, for tourist or business purposes. Visitors from other countries should check Iceland's consular services to see whether they need a visa by going to: www.iceland.is/iceland-abroad/uk/consular-services/visas/

Travel advisory

Iceland has a low crime rate and is, for the most part, free of terrorist incidents. However, tourists are advised to exercise common sense in regards to personal security.

Health

There is high quality medical care in Iceland, but remote areas have limited services. You must pay your own medical costs if you are a nonresident. Expect to pay your medical bill in full prior to leaving the medical center.

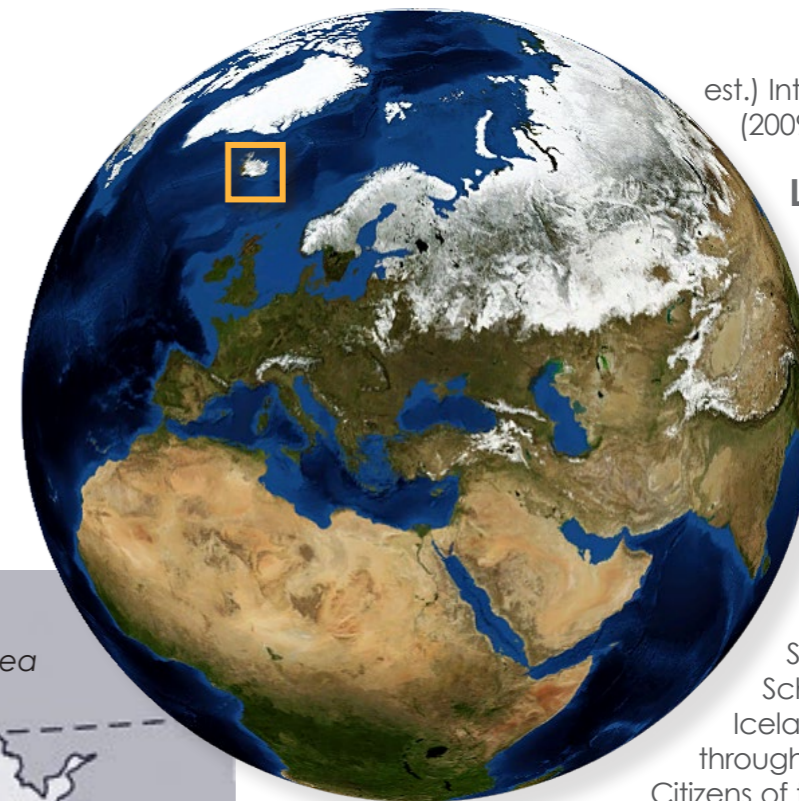
Decompression chamber

Chamber Landspítali Föðvogli Föðvogur, Reykjavík Tel. 354 543 1007

Websites

Iceland Tourism www.iceland.is

RIGHT: Global map with location of Iceland
BELOW: Map of Iceland
BOTTOM LEFT: Photographing the marine life of Strýtan's chimneys



Climate

Iceland has a temperate climate that is influenced by the North Atlantic Current. There are mild, windy winters and cool, damp summers.

Environmental issues

Challenges include water pollution due to fertilizer runoff as well as inadequate wastewater treatment

