EUNIS: **EUROPEAN NATURE INFORMATION SYSTEM (HTTPS://EUNIS.EEA.EUROPA.EU)**

Source: Hill, M.O., Moss, D. & Davies, C.E. (2004b)

HOW DOES EUNIS HABITATS CLASSIFICATION WORKS?

Eunis covers the whole of the European land and sea area

In general, the scale selected for the EUNIS habitat classification is that occupied by small vertebrates, large invertebrates, and vascular plants.

It is comparable to the scale applied to the classification of vegetation in traditional phytosociology.

EUNIS is based on the classification of vegetation

The EUNIS habitat types are arranged in a hierarchy. There are 10 categories in level 1, which is the highest. For each category involved in level 1, there is a level 2 and then a level 3.

An example:

Level 1 category B: Coastal habitats

Level 2 B2: Coastal shingle

Level 3 B2.1: Shingle beach driftlines

Source: Hill, M.O., Moss, D. & Davies, C.E. (2004b)

DEFINITIONS

- A *habitat* is the physical space in which an organism lives.
  - biotic factors
  - abiotic factors
- An *ecological niche* includes all of the factors that a species needs to survive, stay healthy, and reproduce:
  - food
  - abiotic conditions
  - behavior
- A *biotope* is an area with particular environmental conditions that are sufficiently uniform to support a characteristic assemblage of organisms

EUNIS Habitat Classification Revised (2004)
by Cynthia E Davies, Dorian Moss and Mark O Hill

The EUNIS habitat system consists of a database together with explanatory documentation.

EUNIS habitats provide a comprehensive typology for the habitats of Europe and its adjoining seas

EUNIS HABITAT CLASSIFICATION REVISED (2004)

BY CYNTHIA E DAVIES, DORIAN MOSS AND MARK O HILL

HOW TO CLASSIFY HABITATS? THE EUNIS CLASSIFICATION SYSTEM

- A hierarchical system has been developed, that consider all habitat types, natural and artificial, terrestrial, freshwater and marine.
- In the European Union, the EUNIS system was constructed by building a dichotomous key, such as those generated to identify organisms

EUNIS Habitat Classification Revised (2004)
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- Habitat identification can be difficult and requires good botanical knowledge and application skills.
- The dichotomous keys of the Eunis project seek to enable the determination of habitats even for operators without extensive knowledge.

BIOLOGY OF EXTREME ENVIRONMENTS

EUNIS Habitat Classification (November 1999)

A	B	C	D	E
MARINE HABITATS	COASTAL HABITATS	INLAND SURFACE WATER HABITATS	MIRE, BOG AND FEN HABITATS	GRASSLAND AND TALL FORB HABITATS

F	G	H	I	J
HEATHLAND, SCRUB AND TUNDRA HABITATS	WOODLAND AND FOREST HABITATS AND OTHER WOODED LAND	INLAND UNVEGETATED OR SPARSELY VEGETATED HABITATS	REGULARLY OR RECENTLY CULTIVATED AGRICULTURAL, HORTICULTURAL AND DOMESTIC HABITATS	CONSTRUCTED, INDUSTRIAL AND OTHER ARTIFICIAL HABITATS

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DIPARTIMENTO DI BIOLOGIA

EUNIS Habitat Classification Revised (2004)
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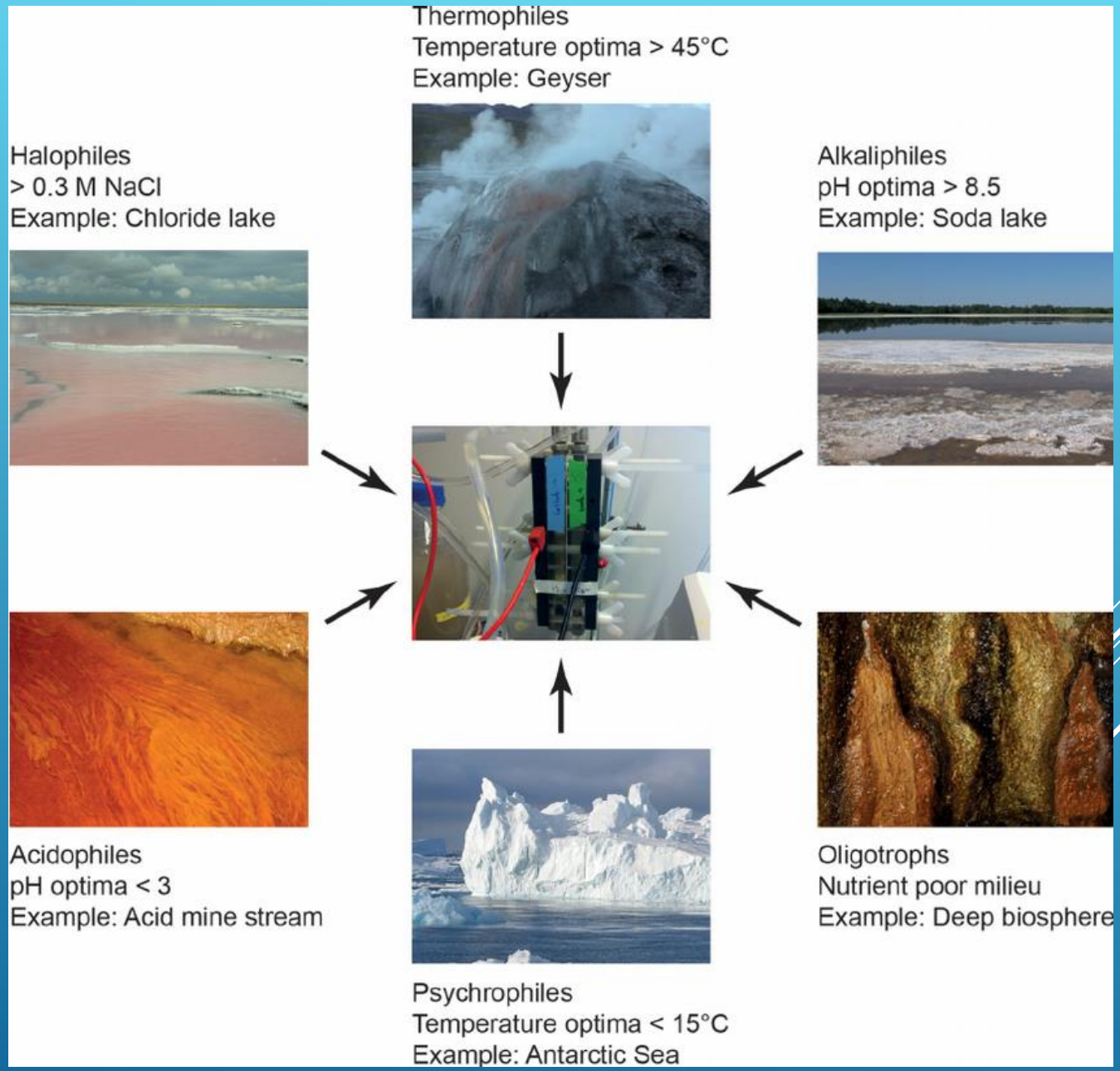
DIFFERENT EXTREME HABITATS AND EXTREMOPHILES



Source: Hill, M.O., Moss, D. & Davies, C.E. (2004b)

Other Extremophiles

- Anaerobes -survive in habitats lacking oxygen
- Barophiles -survive under high pressure levels, especially in deep sea vents
- Endoliths – live in rocks and caves
- Microaerophiles -thrive under low-oxygen conditionsù
- Osmophiles –survive in high osmolite environments
- Toxitolerants - tolerate high levels of toxic substances
- Xerophiles -survive in habitats where water is scarce

Source: Hill, M.O., Moss, D. & Davies, C.E. (2004b)

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Names and Descriptions

You searched for **EUNIS and ANNEX I** habitat types for which **Scientific name / Common name / Code starts with 'mines'**

Results found: **3**

Results displayed per page (max. 300) 10 **Change**

Refine your search

Habitat type name | is | Search

EUNIS Code	ANNEX I Code	Habitat type name	Habitat type english name
H1.7		Disused underground mines and tunnels	Disused underground mines and tunnels
J3.1		Active underground mines	Active underground mines
U12		Disused underground mines and tunnels	null
EUNIS Code	**ANNEX I Code**	**Habitat type name**	**Habitat type english name**

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Names and Descriptions

You searched for **EUNIS and ANNEX I** habitat types for which **Scientific name / Common name / Code starts with 'hot springs'**

Results found: **1**

Results displayed per page (max. 300) 10 **Change**

Refine your search

Habitat type name | is | Search

EUNIS Code	ANNEX I Code	Habitat type name	Habitat type english name
C2.145		Peri-Caucasian hot springs	Peri-Caucasian hot springs
EUNIS Code	**ANNEX I Code**	**Habitat type name**	**Habitat type english name**

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Names and Descriptions

You searched for **EUNIS and ANNEX I** habitat types for which **Scientific name / Common name / Code starts with 'geyser'**

Results found: **2**

Results displayed per page (max. 300) 10 **Change**

Refine your search

Habitat type name | is | Search

EUNIS Code	ANNEX I Code	Habitat type name	Habitat type english name
C2.1		Springs, spring brooks and geysers	Springs, spring brooks and geysers
C2.13		Geysers	Geysers
EUNIS Code	**ANNEX I Code**	**Habitat type name**	**Habitat type english name**

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Hydrothermal and volcanic habitats
A- Marine habitats
A3.7 VENTS AND SEEPS IN INFRALITTORAL ROCK

Description No description available.

Source OSPAR/ICES/EEA (2000)

Legal instruments - Legal instrument Legally designated habitat Code

EU Habitats Directive Annex I Submarine structures made by leaking gases 1180

Descriptive or diagnostic parameters

Parameter Value(s)

Altitude zones (terrestrial and marine): Infralittoral (marine)

Depth zones (for marine habitats): 0 - 5m; 5 - 10m; 10 - 20m

Geomorphology or landform: Reef; Open sea; Submarine gas, oil or water vents and seeps

Substrate types: Bedrock; Hard; Boulders (undefined); Non-mobile cobbles

Source: Hill, M.O., Moss, D. & Davies, C.E. (2004b)

HYDROTHERMAL AND VOLCANIC HABITATS
A- MARINE HABITATS
A6.94 VENTS, SEEPS, HYPOXIC AND ANOXIC HABITATS OF THE DEEP SEA

Description

Deep-sea habitats characterised by chemical conditions. Includes interface habitats on the deep-sea bed where reducing conditions exist (A6.91), not generally associated with drastically elevated temperatures, including the carcasses of large cetaceans (A6.913). These habitats are often indicated by the presence of seeping or bubbling gases or liquids, hypoxic and/or anoxic conditions in the water column above. Also includes vents in the deep-sea bed (A6.94).

Descriptive or diagnostic parameters

Parameter	**Value(s)**
Altitude zones (terrestrial and marine):	Bathyal
Depth zones (for marine habitats):	>200m
Geomorphology or landform:	Open sea; Submarine gas, oil or water vents and seeps
Chemical attributes:	Anoxic/Hypoxic; Reducing conditions

Source: Hill, M.O., Moss, D. & Davies, C.E. (2004b)

HYDROTHERMAL AND VOLCANIC HABITATS
C- INLAND SURFACE WATERS
C3.8 INLAND SPRAY- AND STEAM-DEPENDENT HABITATS

Description

Spray-washed margins of pools below waterfalls. Steamy margins of geysers and hot springs.

Descriptive **or diagnostic parameters**

Parameter	**Value**
Altitude zones (terrestrial and marine):	Littoral (non-marine)
Characteristics of wetness or dryness:	Spray or steam; Aquatic

HYDROTHERMAL AND VOLCANIC HABITATS
H - Inland unvegetated or sparsely vegetated habitats
H6 RECENT VOLCANIC FEATURES

Description
Hard rock surfaces, rock jumbles, loose material deposits, soils, water bodies resulting from recent or present volcanic activity, unvegetated, occupied by lichens or mosses, or colonized by specialised, relatively sparse, shrub-dominated communities.

Source Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)
Descriptive or diagnostic parameters

Parameter	**Value(s)**
Geomorphology or landform:	Volcanoes and volcanic features; Crater, cone; Lava outflow; Lava debris Volcanic dome, plug, neck; Terrestrial gas or vapour vent; Lava tube
Cover characteristics (when used as criteria):	Vegetation <30%
Substrate types:	Volcanic lava

Source: Hill, M.O., Moss, D. & Davies, C.E. (2004b)

HYDROTHERMAL AND VOLCANIC HABITATS
H- Inland unvegetated or sparsely vegetated habitats
H6.1 Active volcanic features

Description
Orifices in volcanic areas emitting hot or cold gases and vapours. Their very extreme environment is colonized by highly distinct communities with few species. Included are steam vents (fumaroles), vapour and hot sulphurous gas vents (solfatares), paint pots, porridge pots and mud volcanoes, as well as cold carbon dioxide, methane and nitrogen vents (mofettes), that emit directly into the open atmosphere. Excludes marine (A6.9) and subterranean (H1.4) vents.
Source Hill, M.O., Moss, D. & Davies, C.E. (2004a)
Legal instruments
Legal instrument Legally designated habitat Code
EU Habitats Directive Annex I Fields of lava and natural excavations 8320
Descriptive or diagnostic parameters

Parameter	**Value(s)**
Geomorphology or landform:	Volcanoes and volcanic features; Crater, cone; Terrestrial gas or vapour vent
Cover characteristics (when used as criteria):	Vegetation <30%
Substrate types:	Volcanic lava
Related phytosociological units:	*Helianthemion guttati*

Source: Hill, M.O., Moss, D. & Davies, C.E. (2004b)

HYDROTHERMAL AND VOLCANIC HABITATS
H - Inland unvegetated or sparsely vegetated habitats
H6.2 INACTIVE RECENT VOLCANIC FEATURES

Features of active volcanoes where emissions of hot or cold gases are absent. Includes barren lava flows, fields of volcanic ash and summits of dormant volcanoes.

- Geomorphology or landform: Volcanoes and volcanic features; Crater, cone; Lava outflow; Lava debris; Volcanic dome, plug, neck; Lava tube
- Cover characteristics (when used as criteria): Vegetation <30%
- Substrate types: Volcanic lava
- Related phytosociological units: Greenovion aureae; Rumici-Astragalion siculi; Spartocytision nubigeni

Source: Hill, M.O., Moss, D. & Davies, C.E. (2004b)

EXTREMELY COLD HABITATS
A- MARINE HABITATS
A8 ICE- ASSOCIATED MARINE HABITATS

Description
Sea ice, icebergs and other ice-associated marine habitats.

Descriptive or diagnostic parameters

Parameter	**Value(s)**
Geomorphology or landform:	Open sea
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Ice; Water and ice interface

Source: Hill, M.O., Moss, D. & Davies, C.E. (2004b)

EXTREMELY COLD HABITATS
A – MARINE HABITATS
A8.4 UNDER-ICE HABITAT

The boundary layer between sea ice and the water column with special abiotic (e.g. temperature, salinity) and biotic (e.g. food resources) factors, which also vary with season and region. This habitat is colonized by autochthonous under-ice amphipods (*Apherusa glacialis*, *Onisimus* spp., *Gammarus wilkitzkii*), which live directly at the ice underside and complete their entire life-cycle here, and allochthonous sub-ice fauna, organisms originating either from the ice interior or the pelagic realm, which are found in this boundary layer temporarily, e.g. for feeding or during certain life stages. There is some evidence that the first metres below the ice are strongly stratified, particularly during the melt period in summer.

Descriptive or diagnostic parameters

Parameter	Value(s)
Geomorphology or landform:	Open sea
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Ice; Water and ice interface

Source: Hill, M.O., Moss, D. & Davies, C.E. (2004b)

EXTREMELY COLD HABITATS
D – MIRES, BOGS AND FENS
D3.1 PALSA MIRES

Description

Mires of the subarctic and northern boreal regions formed by elevated frozen mounds or ridges (palsas), 0.5 to 8m high and up to 50 m in diameter, interspersed wet hollows of similar area. Palsa mires are distributed in the discontinuous permafrost zone of Iceland, northern Fennoscandia and arctic Russia, in areas experiencing subzero temperatures for at least 200 days per year.

Legal instruments

Legal instrument Legally designated habitat Code EU Habitats Directive Annex I Palsa mires 7320, Council of Europe Bern Convention Palsa mires 54.9 Res. No. 4 1996

Descriptive or diagnostic parameters

Parameter	Value(s)
Exposure characteristics:	Frost; Ice
Dominant life forms:	Bryophytes
Substrate types:	Frozen subsoil

Source Hill, M.O., Moss, D. & Davies, C.E. (2004a)

EXTREMELY COLD HABITATS
H – INLAND UNVEGETATED OR SCARCELY VEGETATED HABITATS
H4 SNOW OR ICE-DOMINATED HABITATS

Description

High mountain zones and high latitude land masses occupied by glaciers or by perennial snow. They may be inhabited by algae and invertebrates.

Source Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

Descriptive or diagnostic parameters

Parameter Value(s)

Geomorphology or landform: Glaciers and glacial formations; Glacier; Moraine; Snow pack; Rock glacier

Cover characteristics (when used as criteria): Vegetation <30%

Substrate types: Snow; Ice

Source Hill, M.O., Moss, D. & Davies, C.E. (2004a)

SCIAPHILOUS HABITATS

H1 - TERRESTRIAL UNDERGROUND CAVES, CAVE SYSTEMS,PASSAGES AND WATERBODIES

h1. Underground waterbodies whether or not within caves are distinguished (path = *Yes*).

h2. Disused mines and man-made passages, including tunnels, often with smoothed or constructed surfaces (path = *Yes*) are distinguished from natural subterranean habitats.

h3. Caves formed from hollow basaltic tubes which result from the cooling of the surface of lava flows whose molten interior continued to flow are separated (path = *Yes*) from systems resulting from the action of water.

h4. Cave entrances which are influenced by light, and subject to fluctuating temperature, and which are unlikely to support a specialised fauna are separated (path = *Yes*) from cave interiors and passages beyond the reach of light and with a stable temperature.

h5. Passages restricted in cross-section in comparison with the spaces which they connect are separated (path = *Yes*).

h6. *Standing* waterbodies are separated from *flowing* waterbodies.

Source Hill, M.O., Moss, D. & Davies, C.E. (2004a)

HYPERALINE HABITATS
A – MARINE HABITATS
A8.3 BRINE CHANNELS

During freezing of seawater, salt is rejected from the ice crystals. The remaining brine solution forms a three-dimensional network of tubes and channels with typical diameters of 200 µm within the ice matrix. Despite the harsh environmental conditions (low light intensities, low temperature, high salinity), a specialized community has developed and adapted to live within the brine channel system. Minute unicellular algae like **diatoms** are the dominant primary producers.

Descriptive or diagnostic parameters

Parameter	Value(s)
Geomorphology or landform:	Open sea
Light intensity (when used in criteria):	Low Intensity light
Characteristics of wetness or dryness:	Aquatic
Temperature attributes (when used in criteria):	Super-cooled
Substrate types:	Ice
Salinity levels:	Fully saline; Hypersaline

Source: Hill, M.O., Moss, D. & Davies, C.E. (2004b)

HYPERALINE HABITATS
C - PERMANENT INLAND WATERS
PERMANENT INLAND SALINE AND BRACKISH LAKES, PONDS AND POOLS

Non-coastal brackish, saline or hypersaline lakes, ponds or pools and their pelagic vertebrates and plankton.

- Altitude zones (terrestrial and marine): Sublittoral (non- marine)

Human activities may include: Urbanised areas, human habitation, constructed artificial surfaces; Other industrial / commercial areas; Port areas

Temporal characteristics:1 year; 2 - 5 years; 5 - 10 years; 10 - 20 years;

20 - 100 years; >100 years; Permanent

Characteristics of wetness or dryness: Aquatic

Characteristics of water flow, source & quality: Still

Chemical attributes: Saline; Brackish

Related phytosociological units: *Charion canescentis;*

Ranunculion aquatilis; Ruppion maritimae; Zannichellion pedicellatae

Source: Hill, M.O., Moss, D. & Davies, C.E. (2004b)