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Nota di contenuto	Cover; Contents; Abbreviations; 1. An introduction to ice environments and their biology; 1.1 Introduction; 1.2 Introduction to functional dynamics and the organisms; 1.2.1 Community structure and function; 1.2.2 Organisms; 1.3 The cryosphere: past and present; 1.3.1 The last glacial maximum; 1.3.2 Contemporary fluctuations of glaciers and ice sheets; 1.3.3 Snowball Earth; 1.4 Sea ice; 1.4.1 Nature of sea ice; 1.4.2 Sea ice communities; 1.5 Lake ice; 1.6 Glaciers; 1.6.1 Ice mass balance zones in glacial ecosystems; 1.6.2 Hydrological zonation in surface ecosystems; 1.6.3 Supraglacial lakes 1.6.4 Water distribution in subsurface ecosystems 1.6.5 Water in subglacial habitats; 1.6.6 Overview: broad structure and characteristics of glacial ecosystems; 1.6.7 Life on glaciers; 1.7 Snow; 1.7.1 Physical and chemical characteristics; 1.7.2 Biological activity in snow; 2. Snow; 2.1 Snow as an environment; 2.2 Life on and in snow; 2.2.1 Snow algae; 2.2.2 Bacteria in snow; 2.3 Impact of snow on environments it covers seasonally; 2.3.1 Activity under the snow; 2.3.2 Impact of the release of accumulated nutrients in the snow pack at spring melt; 2.3.3 Variations in snow depth 3. Ice surface environments 3.1 Ice shelves; 3.1.1 Introduction; 3.1.2

Biology of ice shelf lakes; 3.2 Glaciers and ice sheets; 3.2.1 Supraglacial habitats; 3.2.2 Spatial variations in the biota in supraglacial habitats; 3.2.3 Cryoconite; 3.2.4 Carbon cycling and biological production; 3.2.5 Other debris habitats, including the ice margin; 4. Sea and lake ice; 4.1 Sea ice; 4.1.1 Introduction; 4.1.2 Adaptations; 4.1.3 Community structure and production; 4.2 Lake ice; 4.2.1 Introduction; 4.2.2 Community structure and production; 5. Subglacial environments; 5.1 Introduction  
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7.6 Molecular biology 7.7 Elucidating the evolution of extremophile communities; Glossary; A; B; C; D; E; F; H; I; K; L; M; N; O; P; R; S; T; U; V; W; References; Index; A; B; C; D; E; F; G; H; I; J; K; L; M; N; O; P; Q; R; S; T; U; V; W; X; Z

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## Sommario/riassunto

Snow and ice environments support significant biological activity, yet the biological importance of some of these habitats, such as glaciers, has only recently gained appreciation. Collectively, these ecosystems form a significant part of the cryosphere, most of which is situated at high latitudes. These ice environments are important sentinels of climate change since the polar regions are presently undergoing the highest rates of climate warming, resulting in very marked changes in the extent of ice caps, glaciers, and the sea ice. Glacial systems are also regarded as an analogue for astrobiology

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