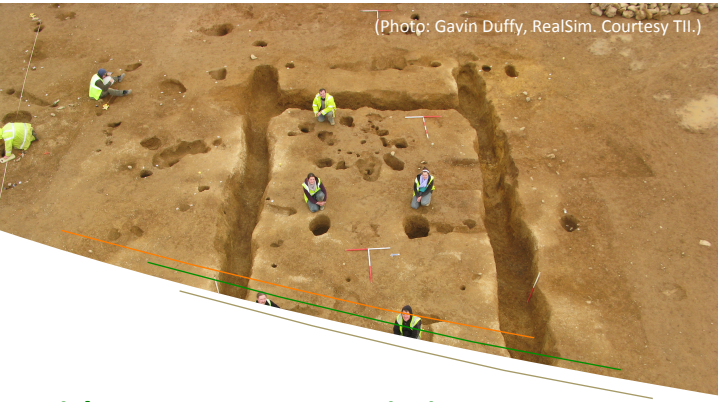
WHY IS THE LAST 2.6 MILLION YEARS IMPORTANT?
During that time Irelands landscape has been dramatically shaped by climate change, sea-level rise, ice-ages, human evolution, the migration of peoples and cultures, and of plants and animals



Irish Quaternary Association

The Irish Quaternary Association (IQUA) is an all-Ireland voluntary organisation of academics, student, amateurs, governmental and industrial partners who are interested in studying and understanding the Irish landscape. The organization had its origins in 1933 under the Chairmanship of Robert Lloyd Praeger. Notable contributors have included Francis Synge, Valerie Hall, Anthony Farrington, Bill Watts and Frank Mitchell. IQUA members have diverse interests and expertise including archaeology, climatology, ecology, agriculture, engineering, geography, geomorphology, geology and hydrology.

Become a Member of IQUA

Membership of the Irish Quaternary Association (IQUA) is open to everyone with an interest in the landscape. As an IQUA member, you will be entitled to attend the annual field meetings and receive copies of the accompanying field guides, attend two annual seminars where recent research is presented by students and national and international experts. Members also receive copies of the IQUA Newsletter twice a year. Annual subscription rates are **€20** (or **€10** for students and the unwaged). Visit www.iqua.ie.

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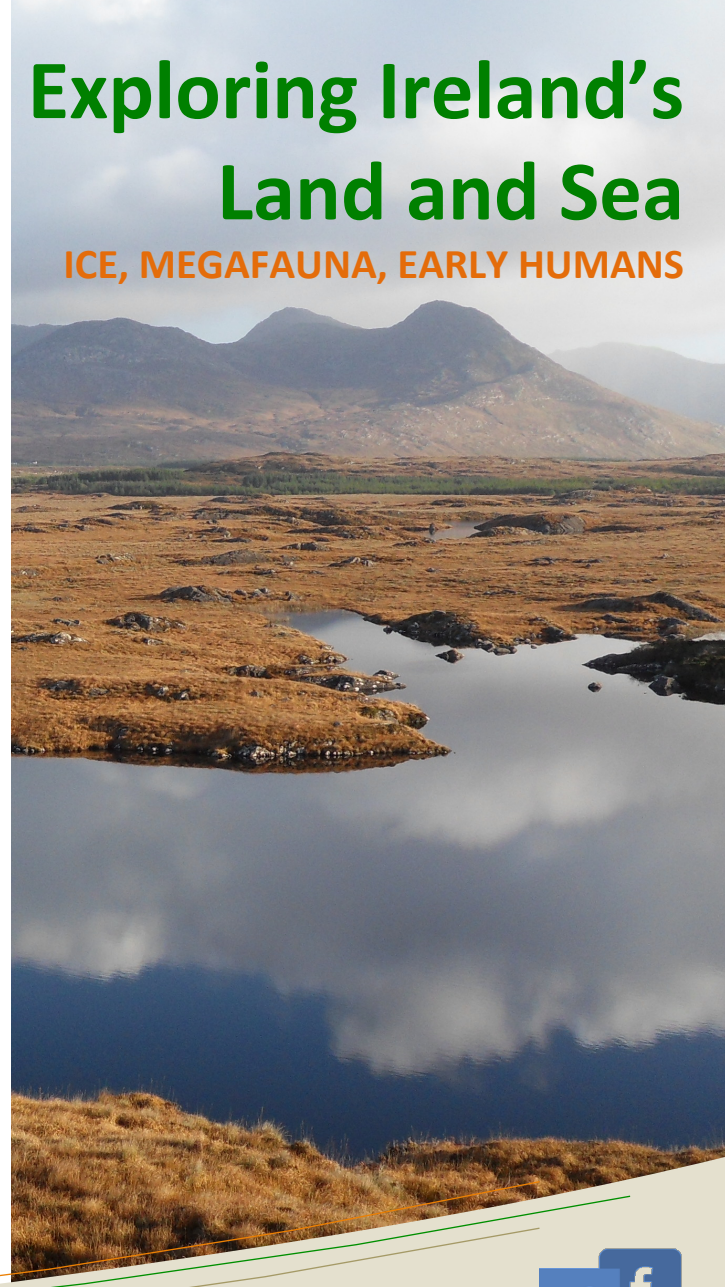
Exploring Ireland's Land and Sea

ICE, MEGAFAUNA, EARLY HUMANS



IQUA

Irish Quaternary Association

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IQUA
Irish Quaternary Association
Cumann Ré Cheathartha na h-Éireann

What is the Quaternary?

In the geological history of Earth, four periods (primary secondary tertiary and quaternary) were initially used to explain Earth time. The Quaternary period beginning 2.6 million years ago (mya) and continuing to the present day is used to describe the youngest earth deposits. This period is characterized by several glaciations (the Ice Ages), with cycles of colder, glacial conditions in mid- to high-latitudes, and warmer 'inter-glacial' periods like that in which we live today. The current warm period 'the Holocene' began 11.7 thousand years ago (kya) and is the most well studied period.

Glaciers move towards lower ground forming DRUMLINS as they moved, MORAINES as they stopped and ESKERS as water started to melt inside them

The 'Ice Ages'

In each glacial period Ireland was covered by thick ice sheets and land areas extended beyond our modern coastlines. The Irish landscape has been shaped by the actions of slowly moving ice (scraping, plucking, moulding, heaving), leaving sand and gravel deposits near their bases, sides and fronts forming the land surface much as it is today. Cold periods saw coastlines extend offshore while sea-level rise caused by the melting ice during warm periods flooded low lying land (e.g. Galway Bay). Fingerprints of glacial erosion are widespread in many mountain areas with over-deepened rock hollows (Corries or Cooms), some of them water-filled, where snow first lay, thickened and nourished ice formation. In west Mayo up to sixty small ice scoured corries can be counted. Near Dublin, good examples are upper and lower Lough Bray, and Lough Tay, with steep rock faces that punctuate the generally rounded Wicklow mountains.

Glacial ERRATICS are rocks transported by glaciers and help determine their geographical extent

The SAND and GRAVEL deposits left behind by glaciers sustains Irelands construction industries

The GIANT DEER (*Megaloceros giganteus*) ranged from Ireland to central Siberia from 400 kya to its extinction about 8 kya

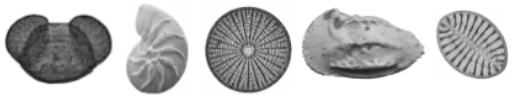
The Power of Water

During cold periods, sea levels greater than 100 metres lower than today exposed coastal landscapes in continental shelf areas and formed land-bridges enabling animals to migrate. In contrast ice-melt during warm periods resulted in moving water playing a large part in erosion of lands and causing landslides. This loose, eroded material or sediment was then deposited in glacially scoured lakes, river valleys, and in estuarine deltas, and on coastal shelves. Quaternary scientists help to read these deposits many of which which are now underwater.

Caves provide a window on the past by preserving FOSSIL remains from extremes in weather and climate and disturbance from scavengers

Plants and Animals

Each individual cold and warm period had unique climate conditions as well as distinctive habitats, plants and animals. The fossilized remains of plants and animals in Quaternary deposits indicate the habitat they occupied and therefore the climatic conditions of their time. Remains of mammoth, bear, giant deer and wolf have all been found by Quaternary scientists. Microfossils including pollen from plants, insect remains, and single celled marine and freshwater organisms like diatoms and foraminifera found in land and water sediment deposits are also important climatic indicators.



The Rise of Humans

The Quaternary is the period during which humans evolved and includes the whole history of our species. Scientists think that climate change may have accelerated the evolution of humans although why and how is contested. Modern man appeared in Africa about 200 kya. By 40 kya, modern humans had begun to settle in Europe only reaching Ireland 10 kya after much of the ice had melted. From that time to the present day Ireland has been shaped and modified by the humans who inhabited our Island. As Quaternary-led archaeologists and historians we study and research this modified landscape, the dwellings constructed within the open spaces, agricultural practices, ritual monuments and Megalithic tombs as well as the tools used to carry out these material changes and shape the landscape we now live in today. Understanding our cultural past helps to make sense of our current Island and its existing dynamics.

Determining 'Time'

Our landscape has been built up in layers of sediments and fossil deposits. In order to understand the past, a variety of techniques are used to understand the relative position of these layers, the timing of disturbances and the rates of change. For example distinctive granite rocks found in a limestone areas suggests that the rock was moved and redeposited while coins or vessels could link two archaeological sites. A continuous record of seasonal and annual climatic change has been established using tree rings (dendrochronology) and covers the past 7300 years. Records can also be developed using lake varves (layers) and ice cores. The age of Quaternary sediment deposits that contain wood, shells or bones can be dated using several different scientific methods such as radiocarbon dating.

PEAT BOGS and lakes contain excellent records of CLIMATE CHANGE in their shorelines, deep-basin SEDIMENTS and fossil records