Global warming is changing the Arctic into something else before our eyes as the region has lost almost half of its summer sea ice cover over the past decades. This transformation will have far-reaching consequences for communities and ecosystems within and outside the region. One key example is coastal erosion: as larger parts of the Arctic Ocean remain ice-free for longer periods, shorelines are no longer protected against the destructive power of waves and winds. Already, the resulting increase in storminess has doubled coastal erosion rates along sections of the Arctic coast, swallowing entire coastal settlements. In addition, higher and more frequent extreme waves threaten the viability of the planned shipping lanes that will cross a sea ice-free future Arctic. However, because we are heading into uncharted climate territory – facing conditions not seen before by our species, the impacts of change remain highly uncertain. **ASPIRE** seeks to fill this critical knowledge gap by using the past as a reference to help understand the future. To do so, we will closely investigate the traces left behind by past storms during times when the climate was even a little warmer and less icy than today. By bringing in new techniques and technology, from drones and satellite date to CT scanners, and combining different lines of evidence from multiple geological archives, we will extract this information with unmatched precision. This unique sensitivity analysis for future risk assessment strongly builds on existing expertise and research infrastructure within the Polish and international polar research communities. By joining forces, sharing knowledge and training a new generation of highly skilled researchers, **ASPIRE** will foster longterm research partnerships between both nations that will last long beyond the project horizon.