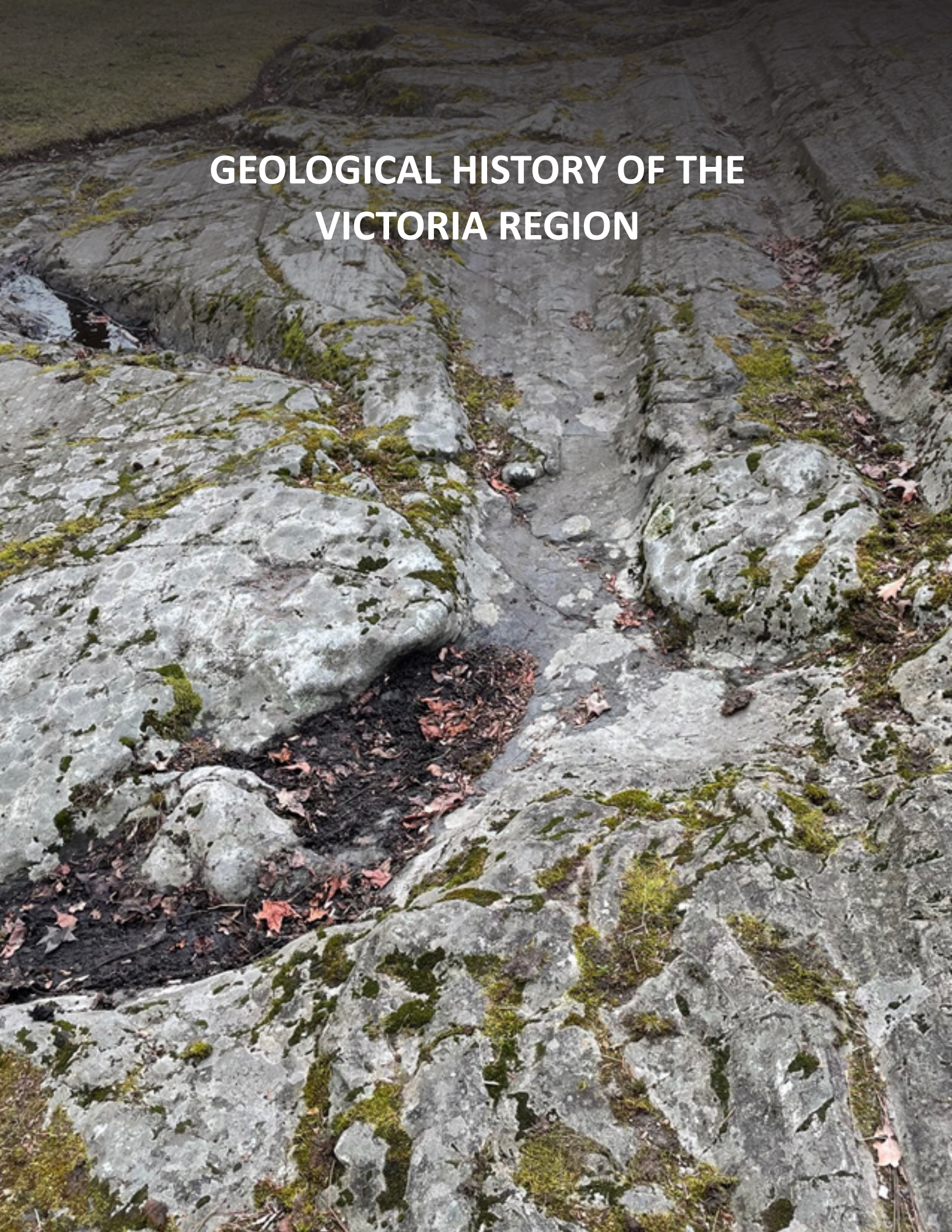


GEOLOGICAL HISTORY OF THE VICTORIA REGION



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SITUATION BRIEF #22

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“Saanich” according to traditional Coast Salish toponymy means “emerging land”. It elicits memories of the safe haven of the higher lands which emerged first after the great flood.

“To realize Victoria you must take all that the eye admires most in Bournemouth, Torquay, the Isle of Wight, the Happy Valley of Hong-Kong, the Doon, Sorrento, and Camps Bay: add reminiscences of the Thousand Islands, and arrange the whole round the Bay of Naples, with some Himalayas for the background ... ”

Rudyard Kipling, while staying at the Oak Bay Hotel, 1907

Although within different frames of reference, the topography of the region has long elicited significant responses from those who lived on the land for thousands of years, settlers and visiting tourist alike.

Evidence

Across Victoria we can observe the flutes and striations of the sculptured bedrock created when a large glacier ground across the landscape 15,000 years ago. Knobs of hard bedrock crop out throughout Victoria mostly of dark intrusive

rocks called gabbro and diorite, together with metamorphic volcanic rock called greenstone and some pale granitic dykes. All of these belong to a much deeper geological history of massive layers of ancient terranes uplifted and exposed by later erosion.

Vancouver Island is on the leading edge of the Cascadia Subduction Zone. Subduction zones are where continental arcs and island arcs become accreted to continental margins. Here the Juan de Fuca plate travels under Vancouver Island while the Pacific plate to the west is pushed in the opposite direction. What we see today is the result of a series of processes acting over 370 million years. The upward pressure on the North American Plate has pushed up the Gulf Islands and created the Pacific Coast Range of mountains which provide the dramatic scenic backdrop to the Victoria.

Today, the rocks that form Vancouver Island are recognized to make up a large recently accreted terrane called Wrangellia, which extends under water to arise as the Islands of Haida Gwaii and the Wrangle mountains of Alaska. A more local unique component of Wrangellia is called the Jurassic Bonanza arc that formed 203 to 164 million years ago.

History

Wrangellia is made up mostly of ancient volcanic and sedimentary rocks that are intruded locally by granitic rocks. Wrangellia's rocks represent an exotic terrane that formed out in the ocean basin and was accreted to the continent, along with other smaller terranes comprising a physiographic region called the Insular Superterrane, by mid- Cretaceous time 100-115 years ago.

The Island's geoscape hosts a quite rare tectonic collage. It is comprised of remnants of very ancient plates that go back to the earliest times of the formation of continents. Victoria is unique in the number of remnant terranes

compressed into its peninsular landscape. Two more recent survivals of continental drift, the Pacific Rim and the Crescent terranes arrived from the South Pacific about 55 and 42 million years ago. They are also unique to the North American continent.

The regional tectonic environment results in an interesting and varied geology and topography, and also natural hazards that include earthquakes, volcanoes, tsunamis and landslides. The last documented major earth quake happened in 1700 and the next is predicted to occur within the next 300 years.

The record

This geological history of the composition of terranes, explain the stone and mineral wealth found in the environs of Victoria, coal, clay, limestone, gold, copper and tool making stone of many kinds have played a role in both Indigenous cultures and the history of the city. Seismic events play a role in First Nations oral histories. Hundreds of Indigenous archaeological sites are recorded in and around the city as well as some mining and quarry sites that have been designated historic sites, the most well-known of the latter being the repurposed limestone quarry now Butchart Gardens.

The portability of Indigenous plank house technology might well have been in part an adaptation to seismic related events such as flooding, tsunamis, land slippage. By the late 19th Century Victoria's larger scale masonry buildings



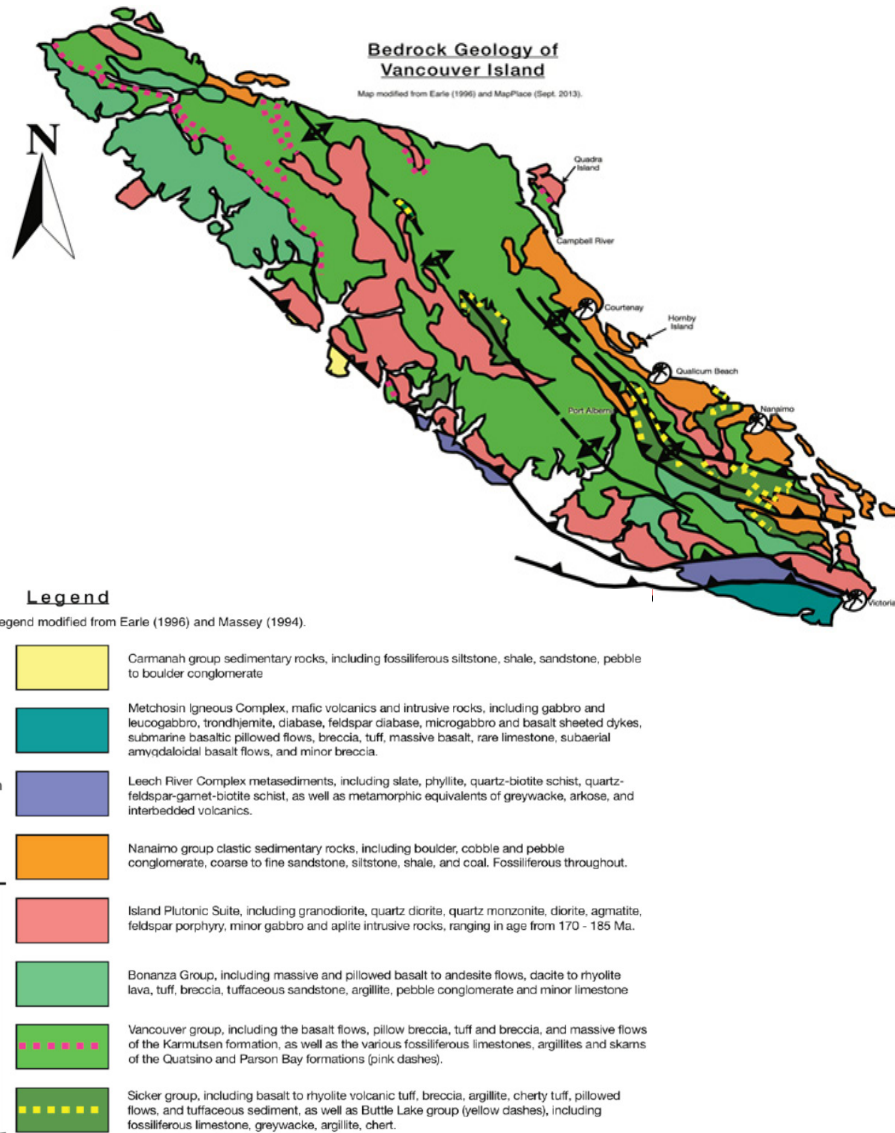
were already being engineered for seismic resiliency.

The joining of two ancient continents where a person can stand with a foot on each continent at Harling Point and Place to see glacial grooves at Horseshoe Bay in Beaconhill Park.

Observations

- The history of Victoria's unique geoscape is generally underappreciated and little known. Although it can be easily read from the region's landscape public interpretive signage largely omits references to it.
- An opportunity is provided for general education on the nature of the seismic risks which have in recent years prompted extensive public expenditure on everything from public safety protocols to upgraded building codes.
- Victoria is noted as an international laboratory for seismic research. The University of Victoria is the hub for an array of ocean-bed sensor which monitor the major seabed faults for seismic activity. A proposal for a public interpretation centre for the data accumulating under this project was mooted several years ago. The feasibility of this proposal should be re-examined either as a stand-alone facility or incorporated into a revitalized maritime museum or the planned exhibits renewal of the Royal British Columbia Museum.





References

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