



# Uranium in Nunavut

## Uranium is about to go Nuclear

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# Presentation Outline

- Uranium Discovery and Mining in Canada
- Uranium Importance and Uses
- Exploration History in Nunavut
- Nunavut Uranium Occurrences
- Geological Environments
- Examples: Basins, Deposits
- Benefits and Outlook





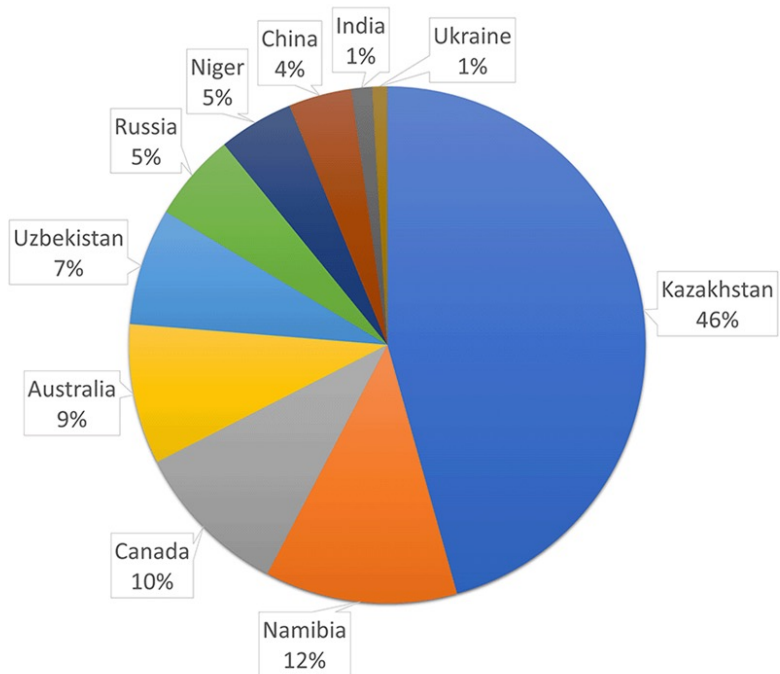
# Uranium Discovery and Mining History in Canada

- Discovered in 1789 by Martin Klaproth, a German chemist
- Mid-1800s on the north shore of Lake Superior.
- In the 1930 the LaBine brothers discovered cobalt, radium, uranium and silver on the north-eastern shores of Great Bear Lake.
- 1934 Uranium was first discovered in the Athabasca Basin.
- 1952 Uranium City was established to service the area. There were 52 operating mines and 12 open pit mines in 1954.
- 1968 The first mine in the eastern Athabasca basin was the Rabbit Lake Mine.
- The biggest and most important mine is Cameco's McArthur River mine, the world's largest high-grade uranium mine.

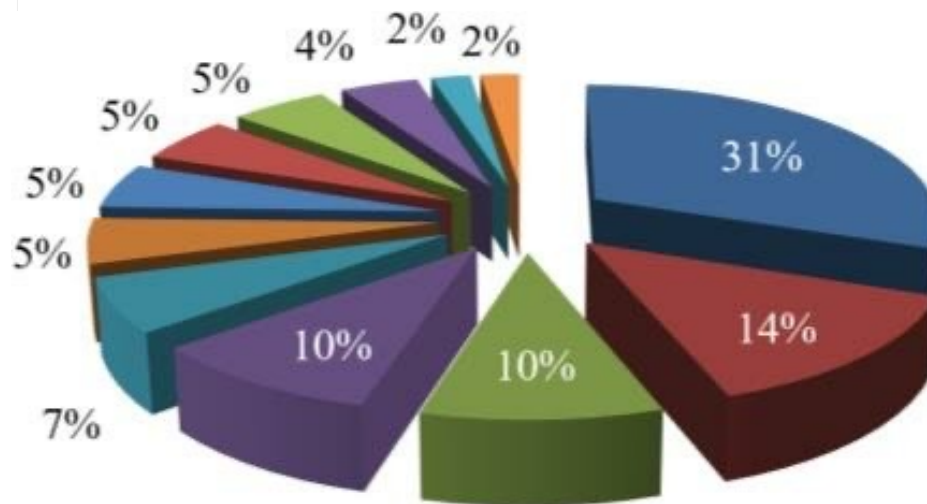




# Uranium Production in 2024 and Reserves 2022



Uranium Production



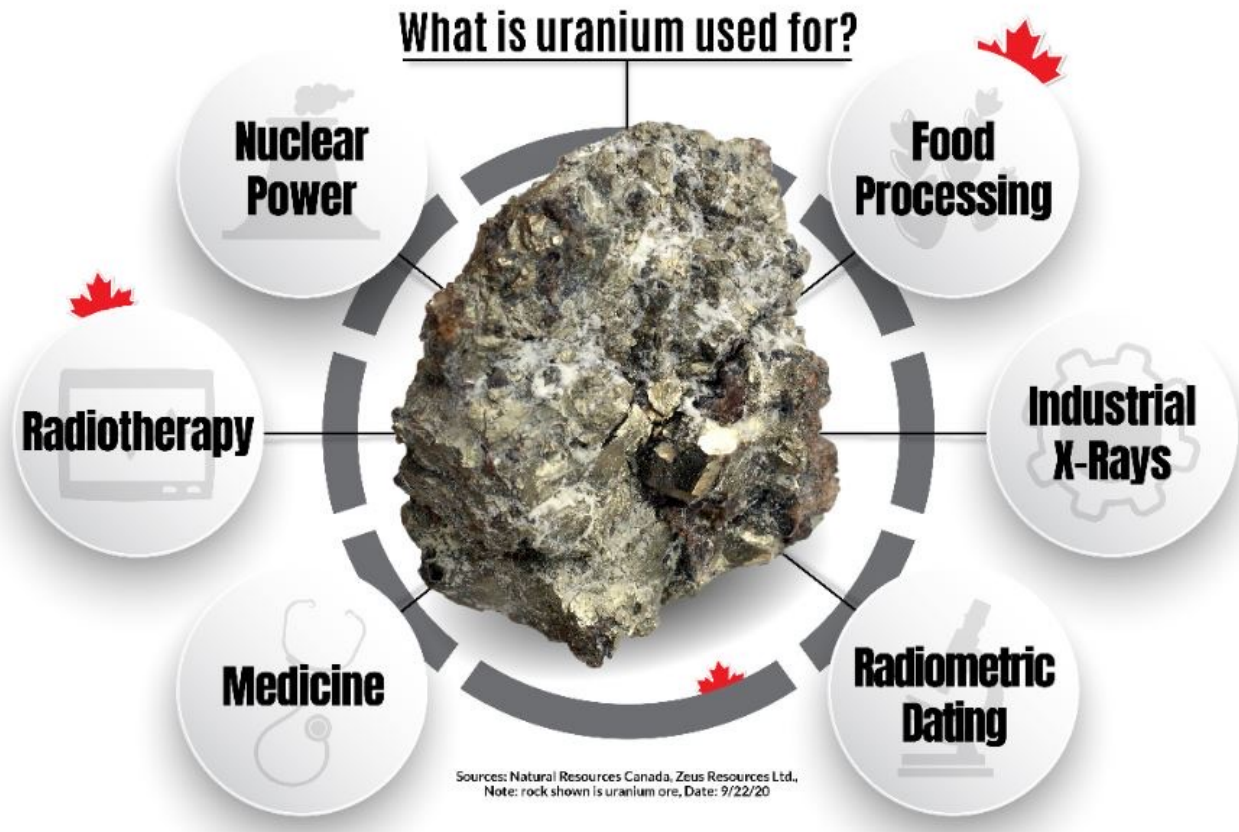
- Australia
- Russian Fed
- Brazil
- Mongolia
- Kazakhstan
- South Africa
- China
- Uzbekistan
- Canada
- Niger
- Namibia
- Ukraine

Uranium Reserves





# What is Uranium used for?

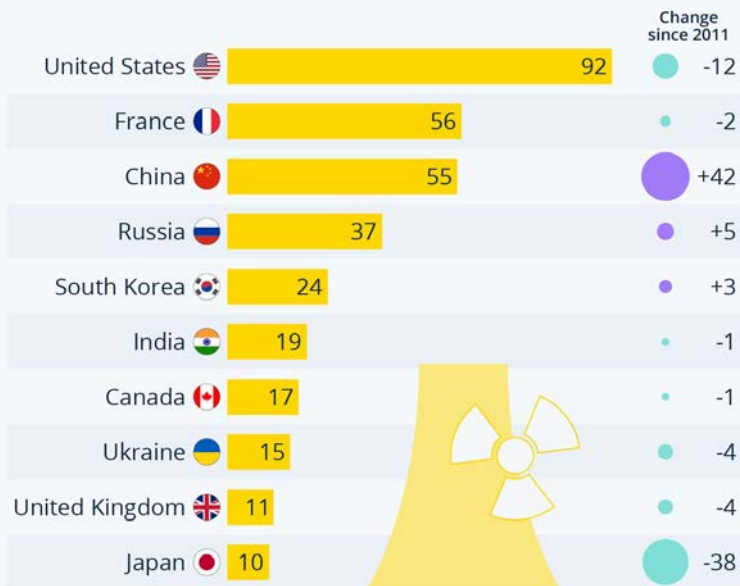




# Reactors

## The Countries With the Most Nuclear Reactors

Number of operational reactor units by country in 2022

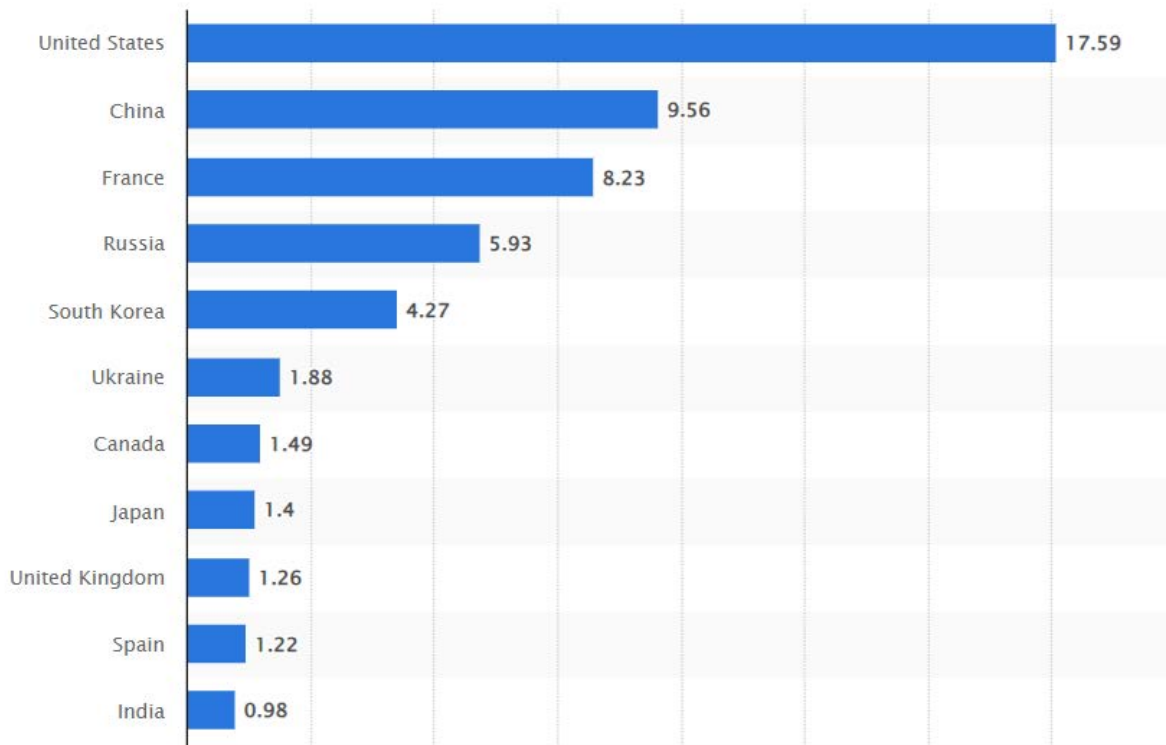


Source: World Nuclear Industry Status Report 2022





# Uranium Usage

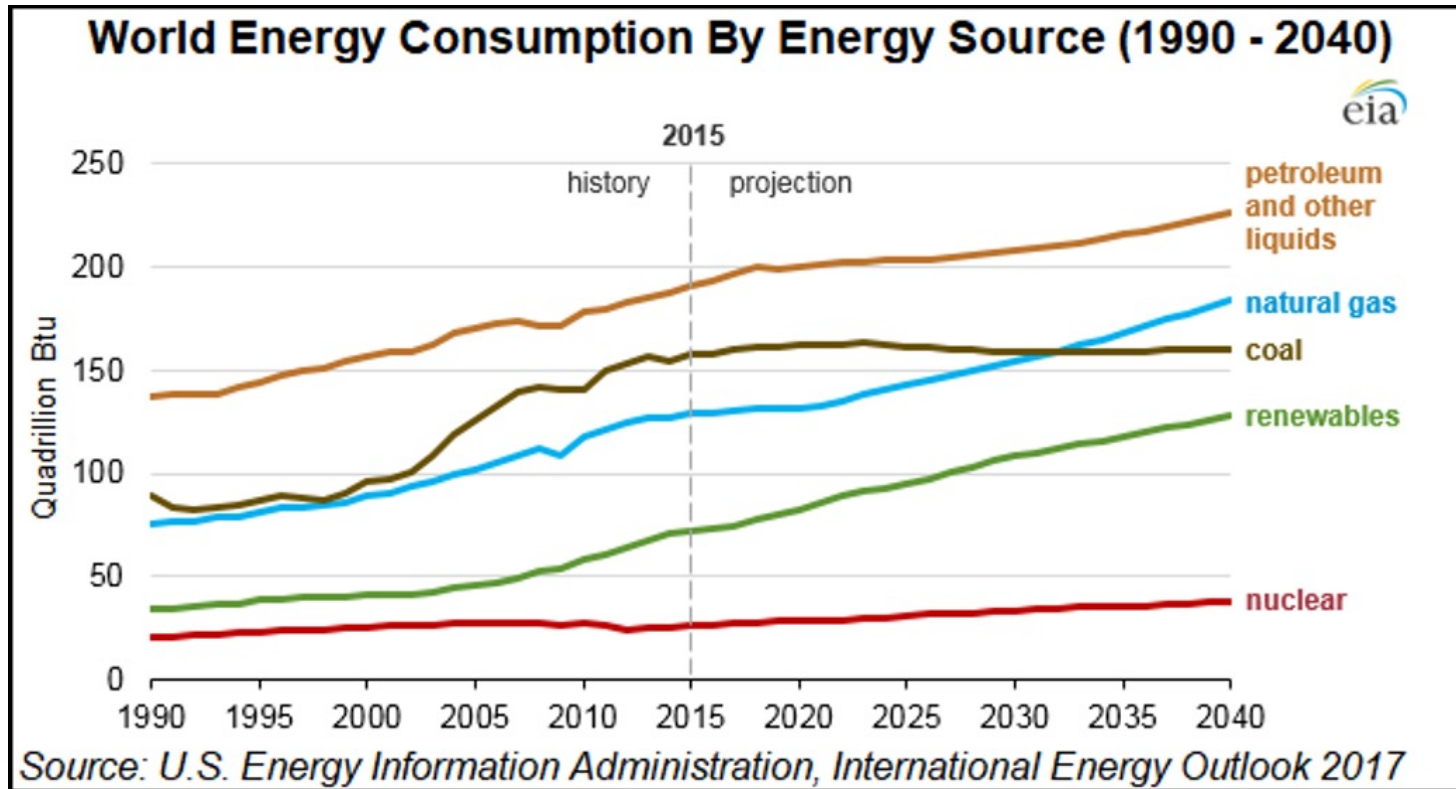


Reference: [Uranium consumption ranking by top countries | Statista](#)





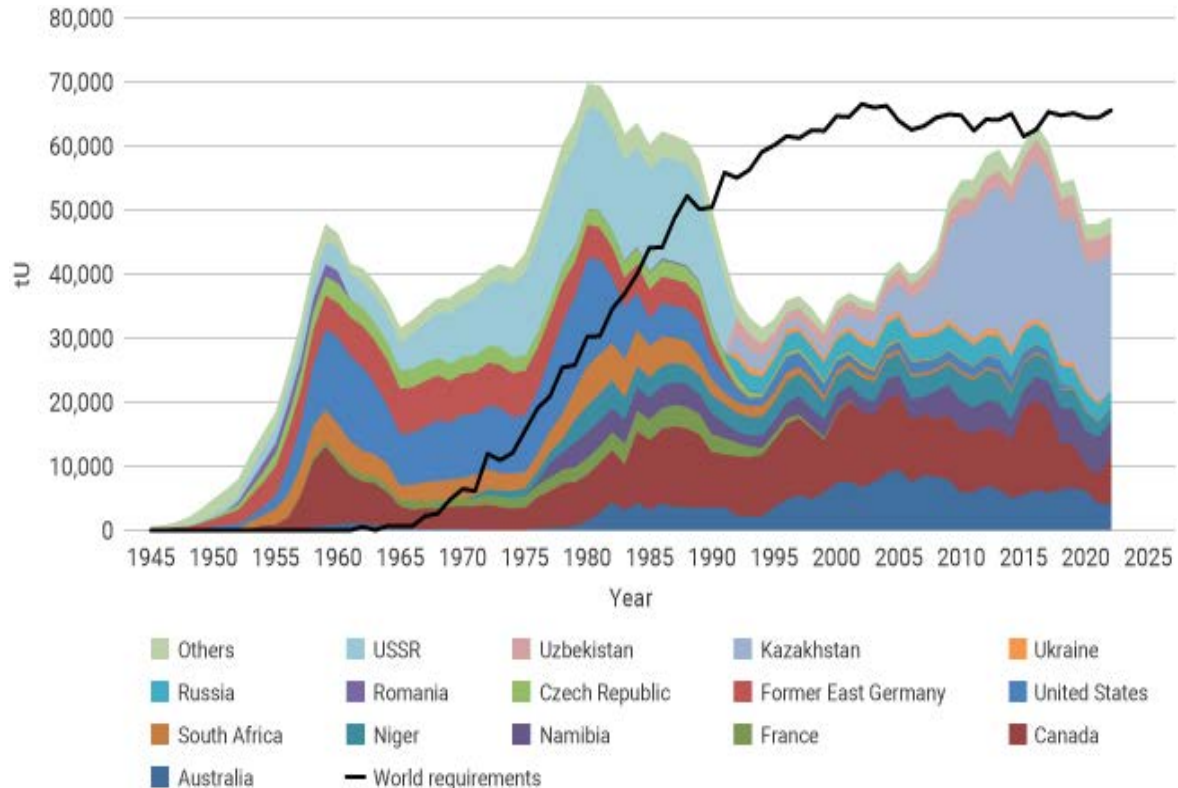
# Energy Consumption and Sources







# Uranium Supply and Demand

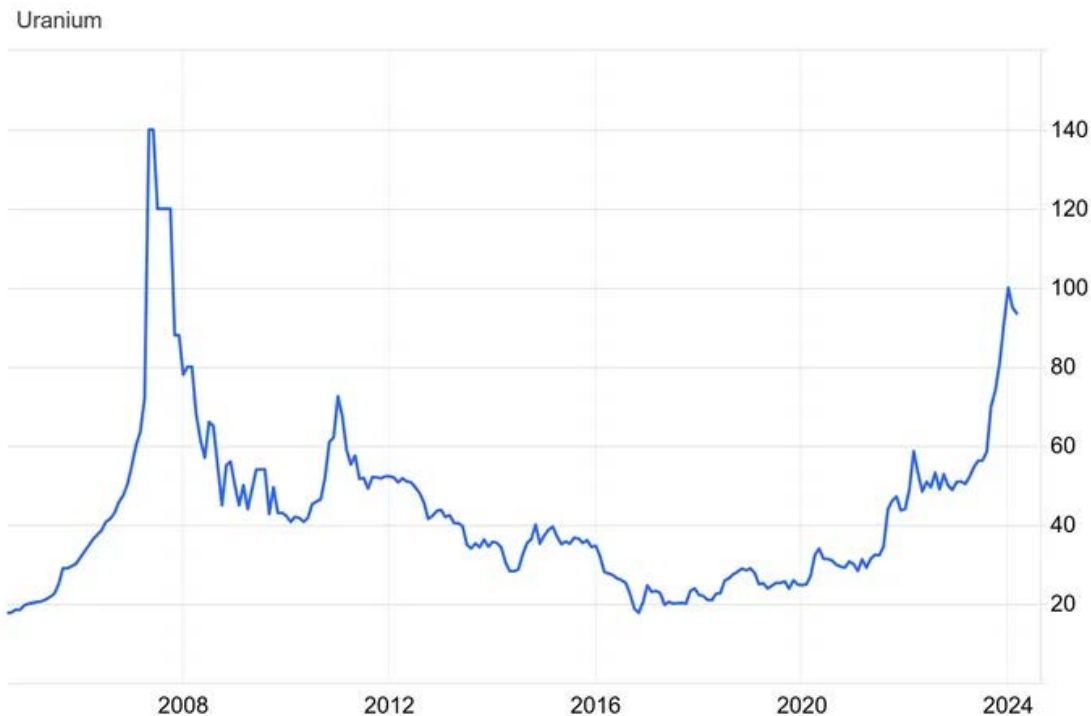


Reference: World Nuclear Association – Uranium Markets





# Uranium Market Price and Trend



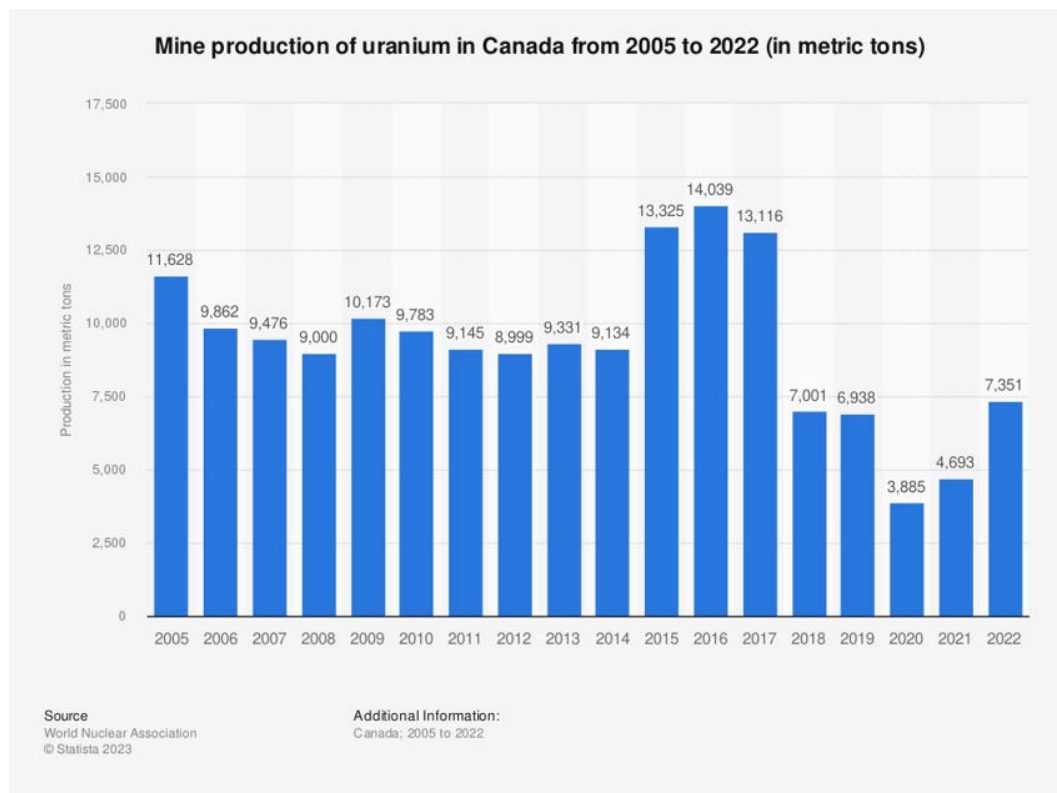
source: tradingeconomics.com

Reference: Key Factors Affecting the Uranium Price Outlook - IG UK, 4 April 2024



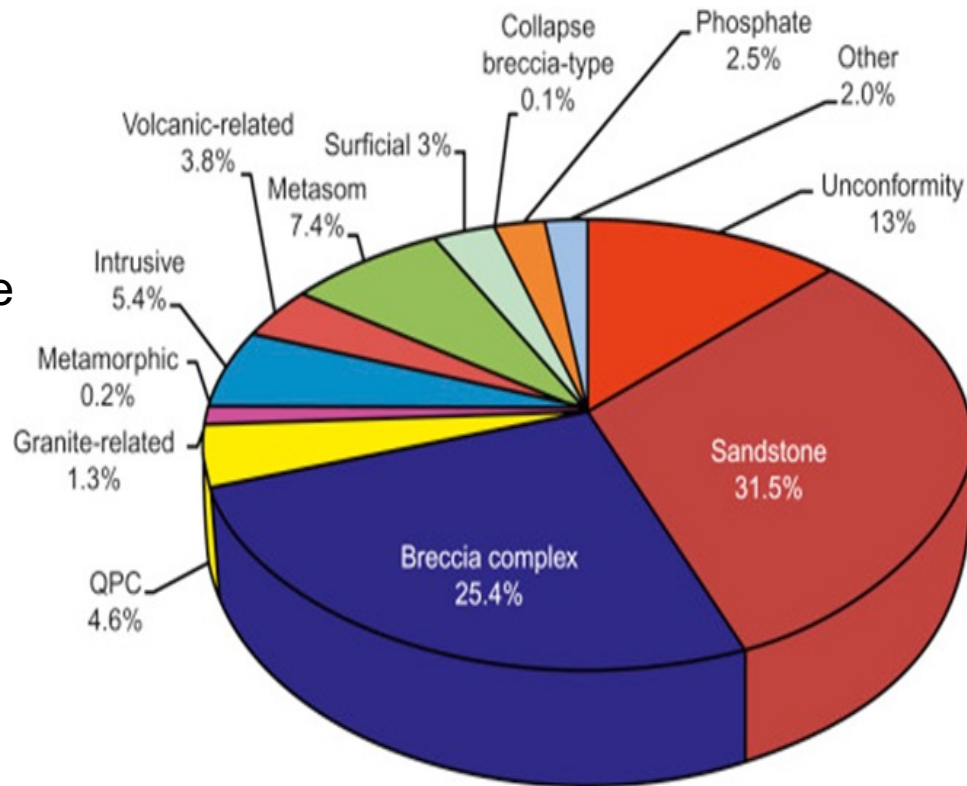


# Canadian Uranium Production



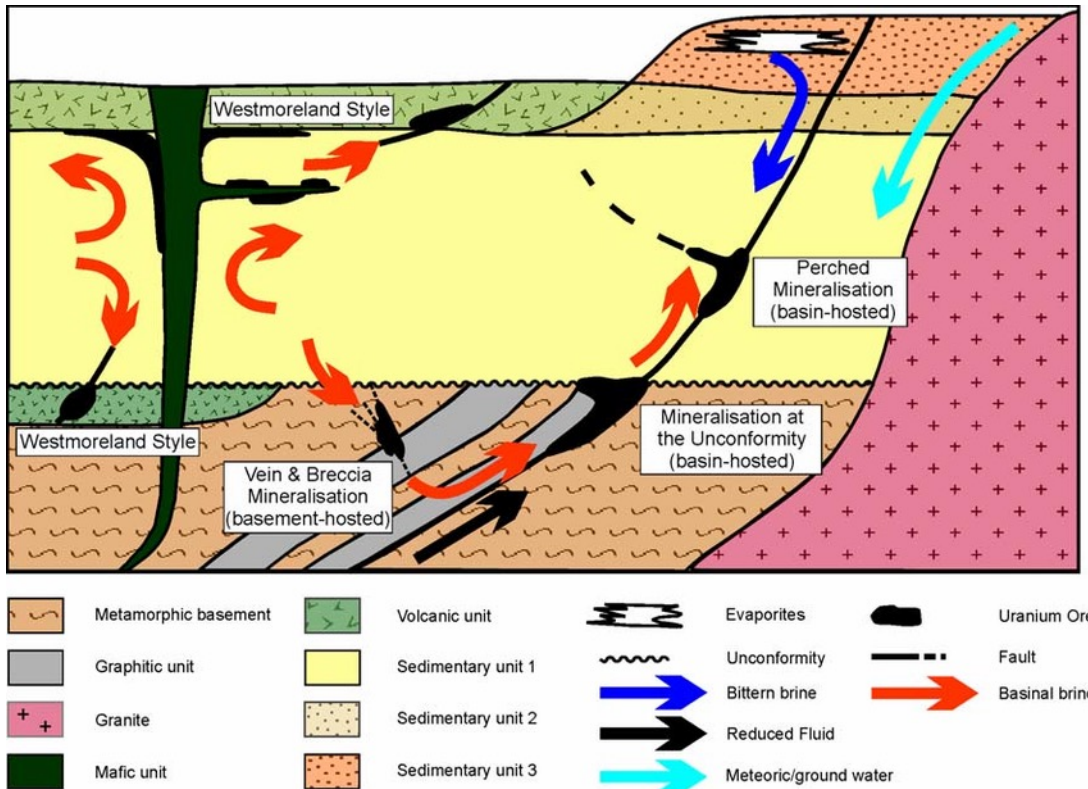
# Geology of Uranium Deposits

- Uranium deposits worldwide are grouped into 15 major types based on their geological settings. Some categories have several sub-types.
- Most Kazakh uranium resources are sedimentary.
- Most Canadian resources are unconformity-related.
- Most Australian uranium resources are in unconformity-related and in iron oxide breccia complex orebodies.





# Uranium Basin Geology

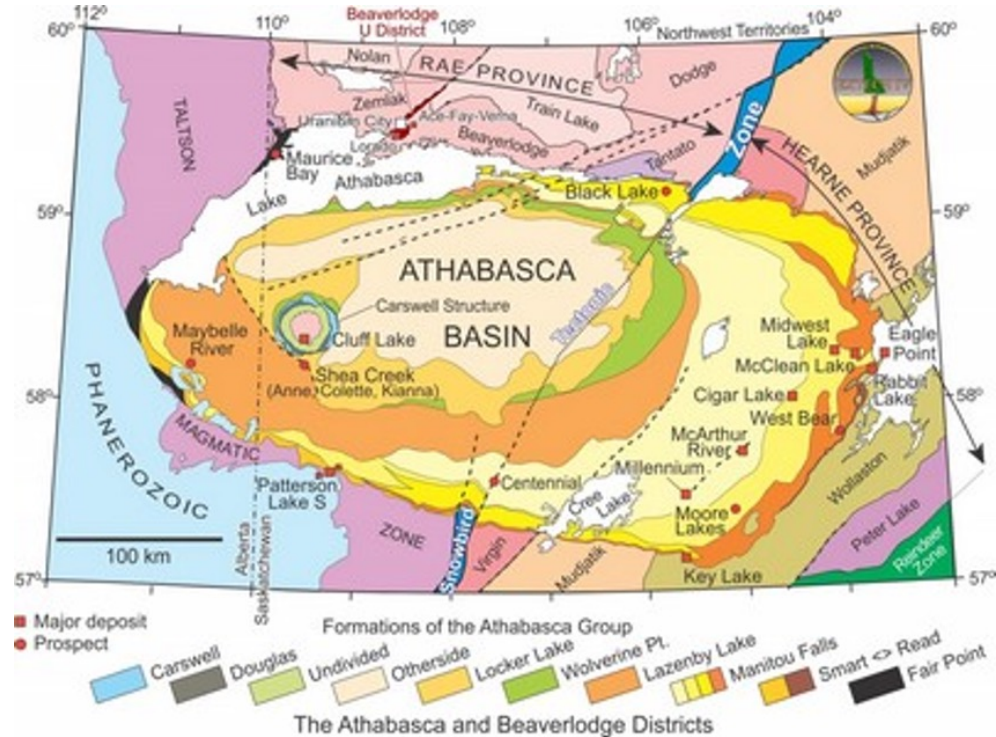


Reference: Huston, 2010



# Uranium in Canada– Athabasca Basin, Saskatchewan

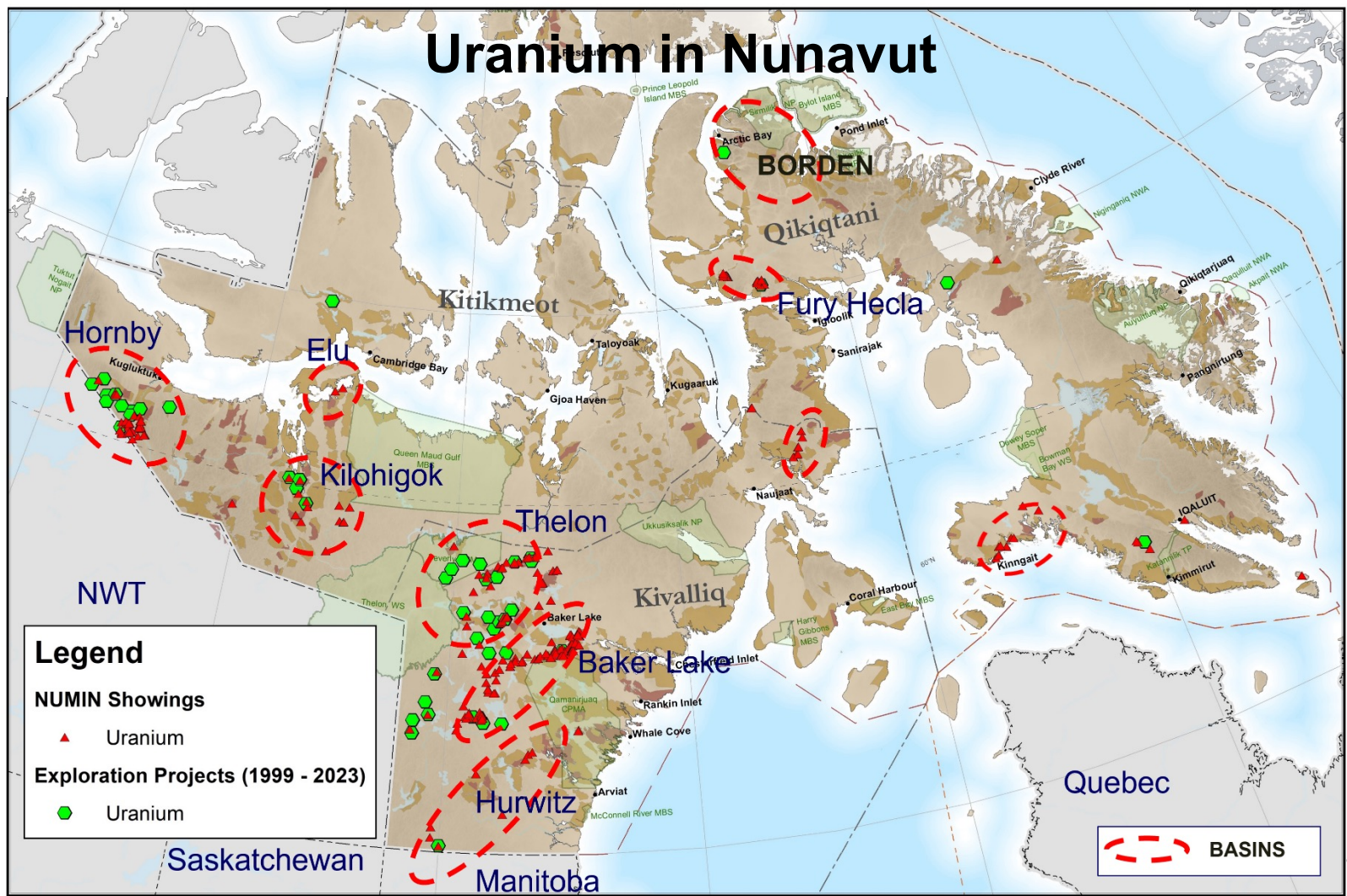
- Intracratonic basin
- Siliciclastic sediments, preserved thickness of over one kilometer.
- Thick lateritic paleoregolith is preserved under the sandstones.
- Diabase dykes of the Mackenzie swarm intruded the sandstones approximately 1250 Ma ago.
- Areal extent is about 85,000 km<sup>2</sup>



Reference: 43. Athabasca Basin (1888) (science.gc.ca)



# Uranium in Nunavut



**Legend**

**NUMIN Showings**

- ▲ Uranium

**Exploration Projects (1999 - 2023)**

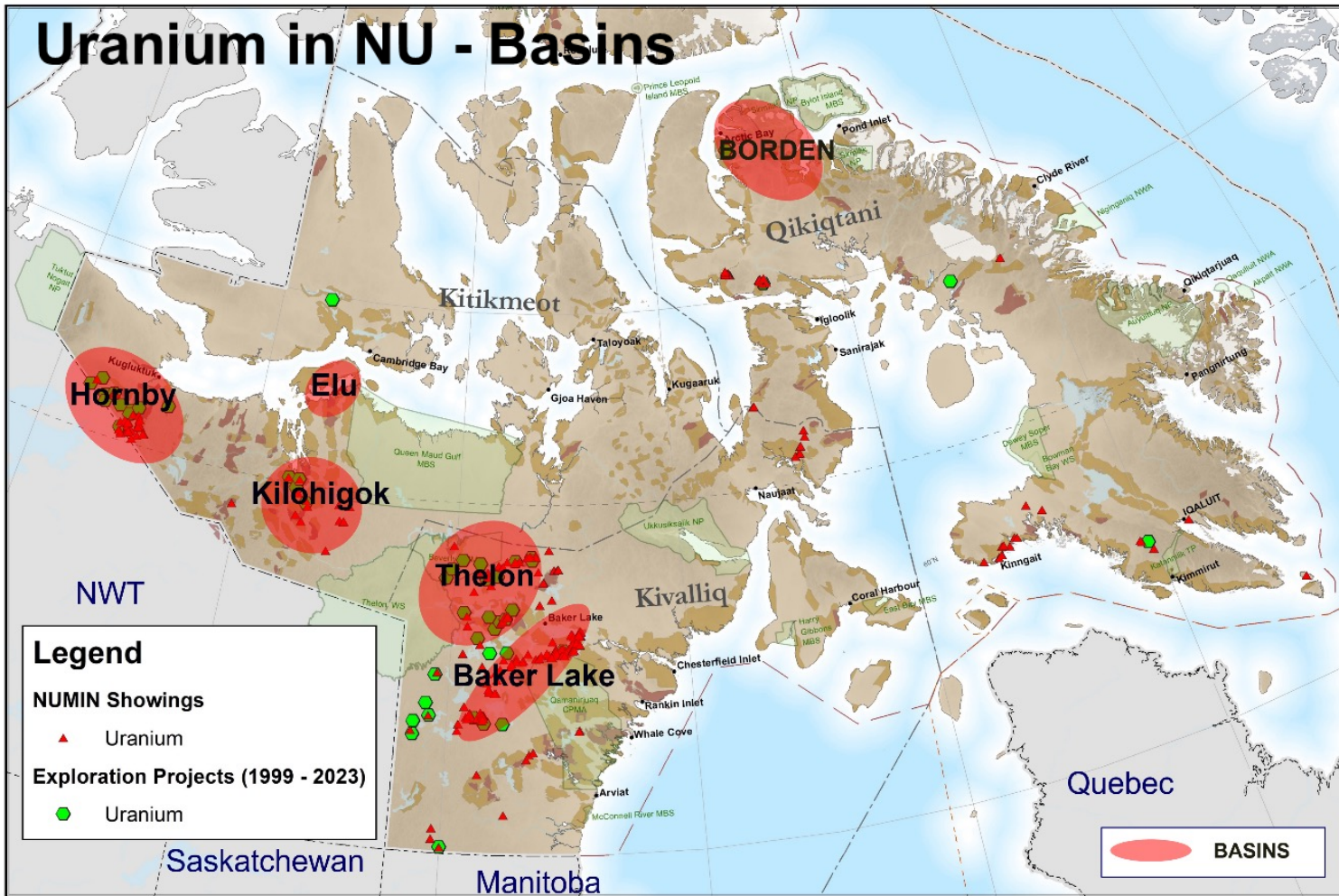
- Uranium

**Basins**





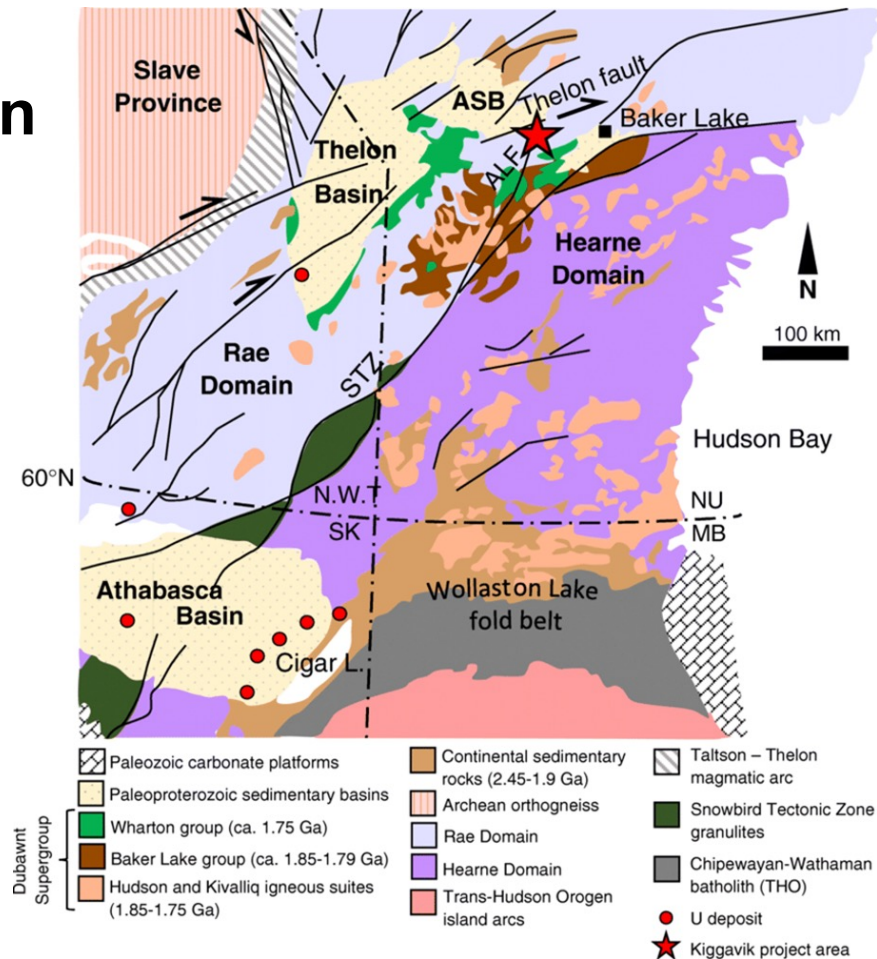
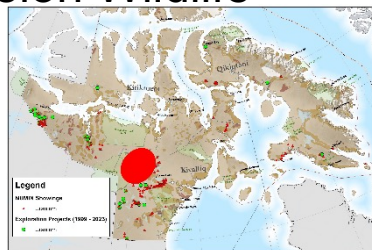
# Uranium in NU - Basins





# Uranium in NU – Thelon Basin

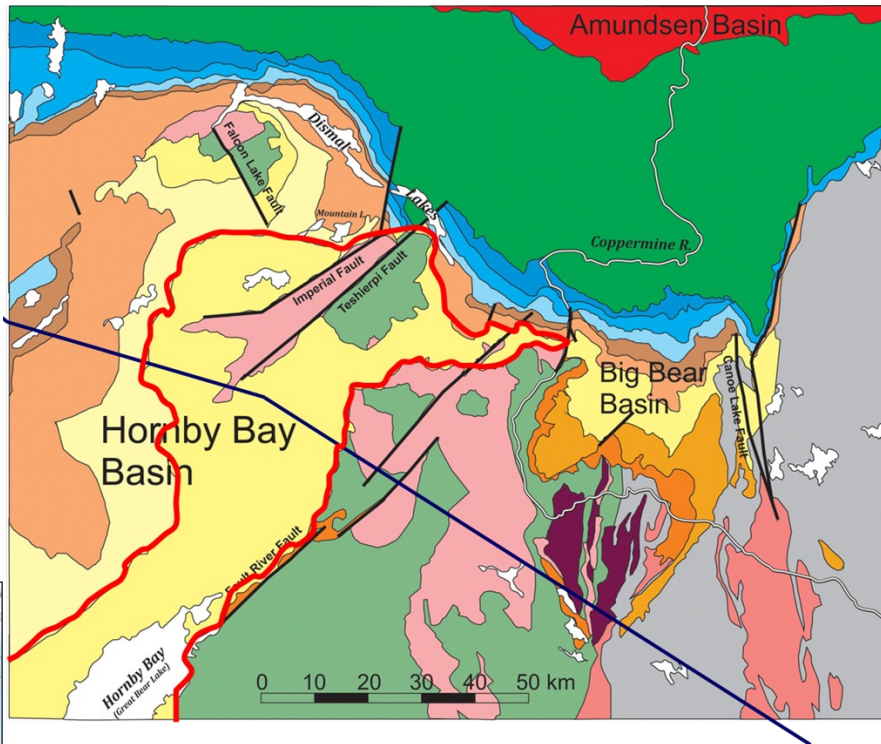
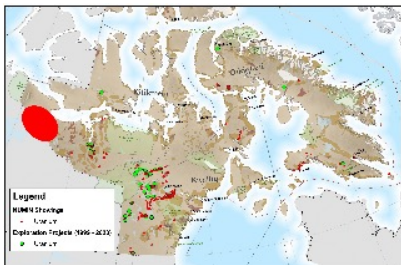
- Paleohelikian intracratonic basin.
- Diabase dykes intruded the sandstones  $\pm 1250$  Ma ago.
- Lateritic regolith preserved up to 1km thick sandstone.
- The present areal extent of each basin is about 85,000 km<sup>2</sup>.
- Large part of the Thelon Basin overlaps with the Thelon Wildlife Sanctuary.



Reference: Shabaga, 2021

# Uranium in NU – Hornby Basin

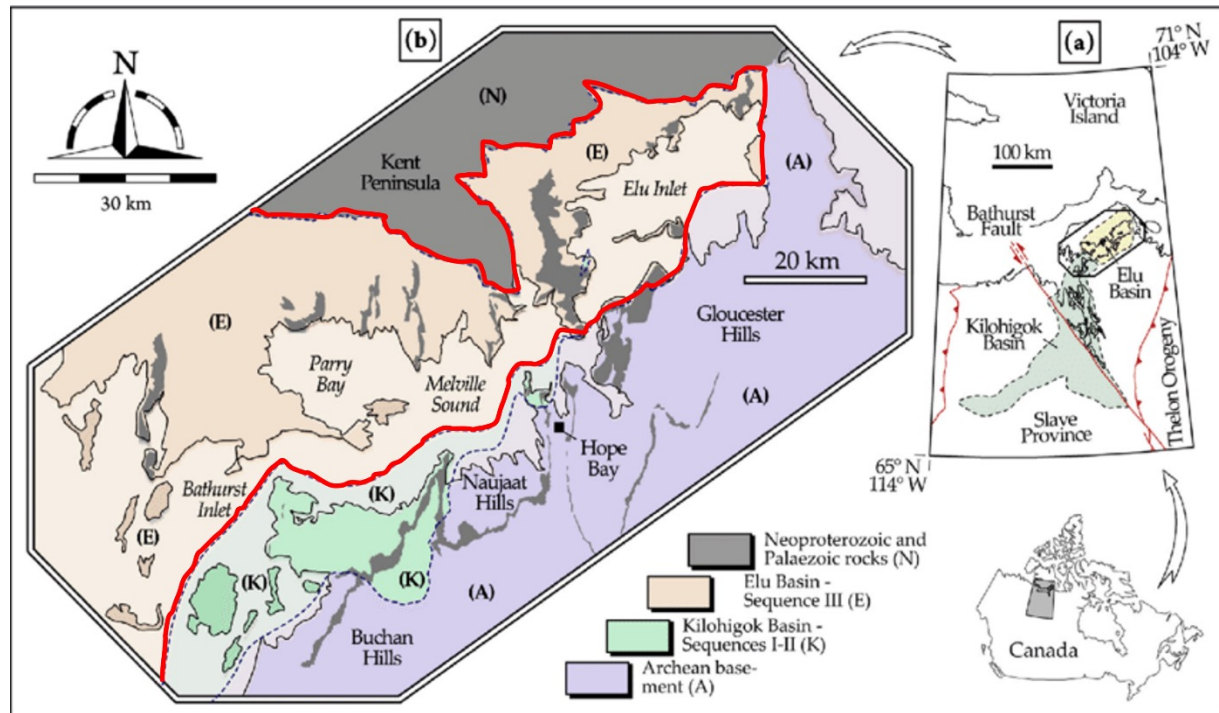
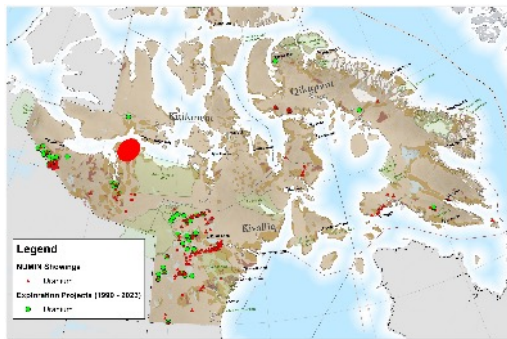
- Exploration prospect for unconformity-type uranium deposits
- Overlies granitoids and metavolcanics of the Wopmay Orogen dated at 1.85 Ga
- Sedimentary succession up to 4 km deep





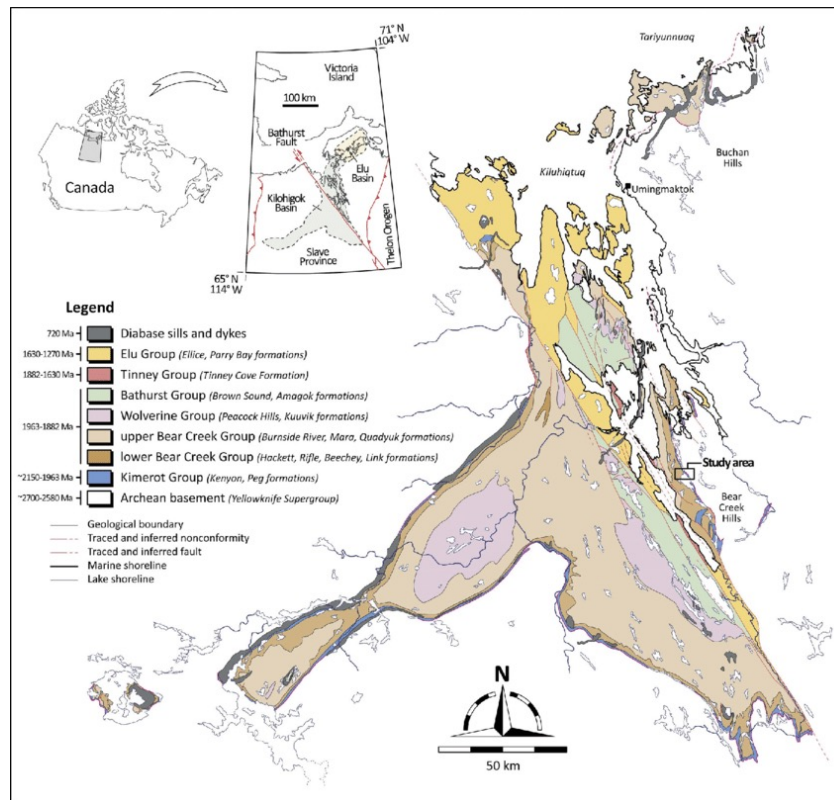
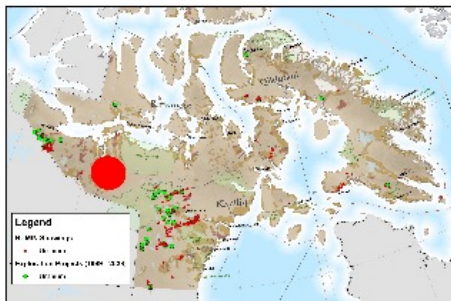
# Uranium in NU – Elu Basin

- Paleo to Mesoproterozoic
- 1.9– 1.6 Ga sandstone-dominated fluvial deposits and shallow-marine carbonate rocks
- Resting unconformably on Archean Slave Province



# Uranium in NU – Kilohigok Basin

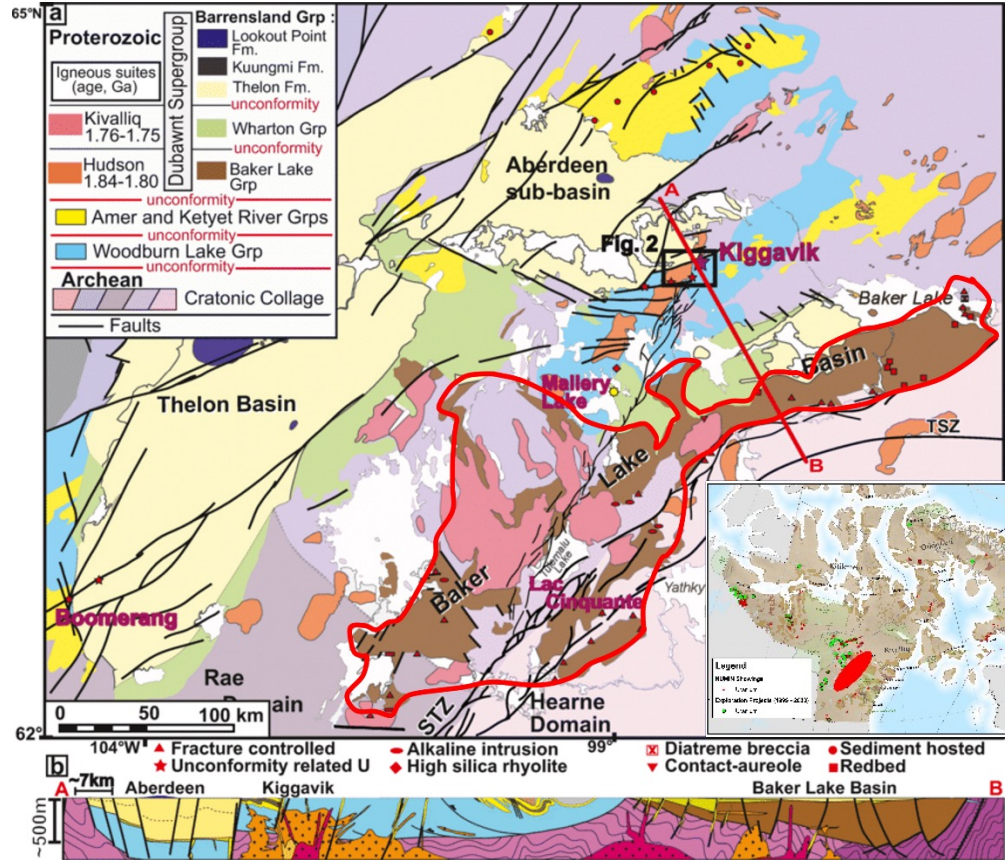
- Lower part composed of nearshore-marine facies.
- Upper part consists of fluvial facies.
- Exposed part in NE is entirely continental deposits





# Uranium in NU – Baker Lake Basin

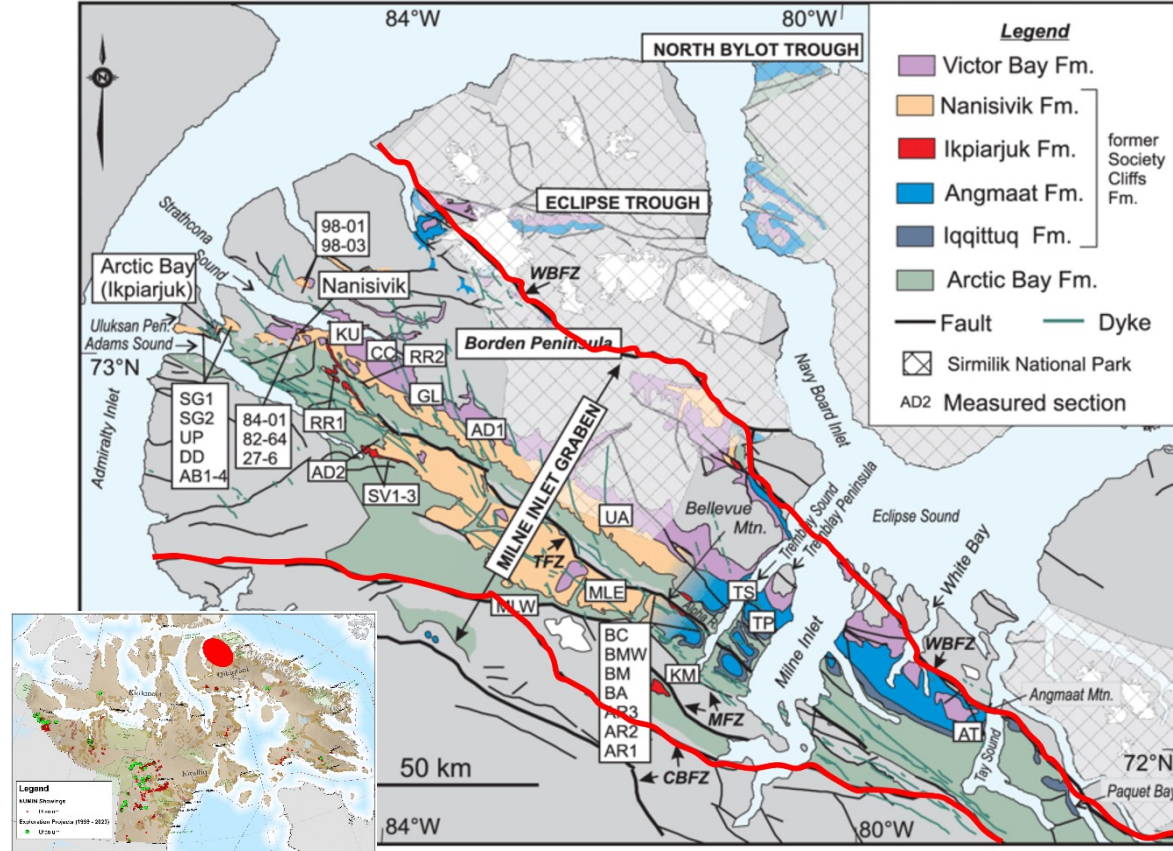
- Northern extent of a series of basins that trend northeastward along the Snowbird Tectonic Zone.
- Baker Sequence (1.84-1.78 Ga) formed due to regional extension and crustal thinning.
- Half-graben host siliciclastic alluvial, eolian, and lacustrine deposits and localized felsic volcanics.





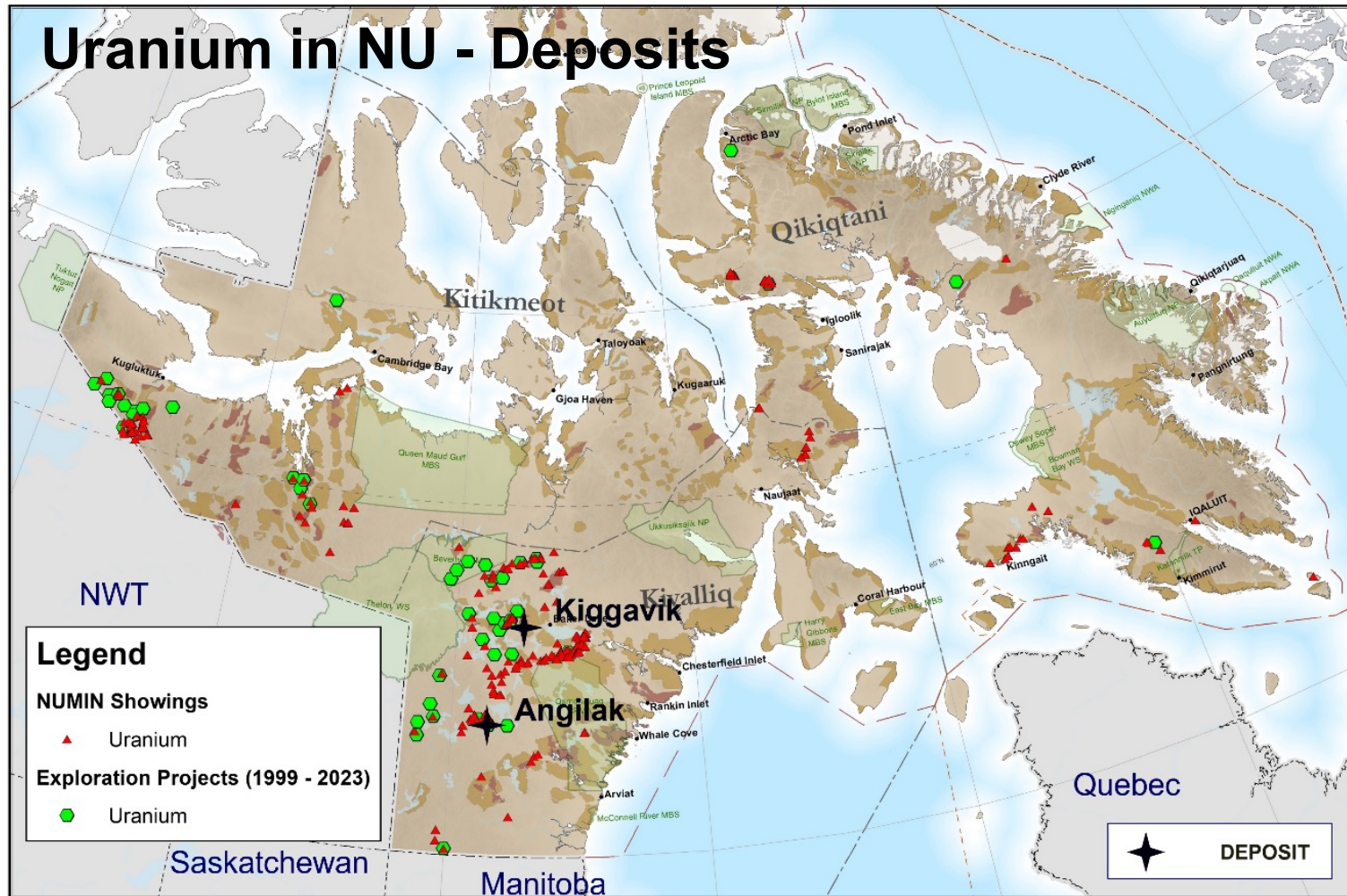
# Uranium in NU – Borden Basin

- 3 rift systems, largest is the Milne Inlet Graben.
- Basins resulted from extension related to the Mackenzie igneous event.
- SW trend Milne Inlet Graben is 250 km long, spans the Borden Peninsula and areas southeast of Milne Inlet.
- Multiple formations lie on top of basalt and the 1267 Ma Rae Province Basement.





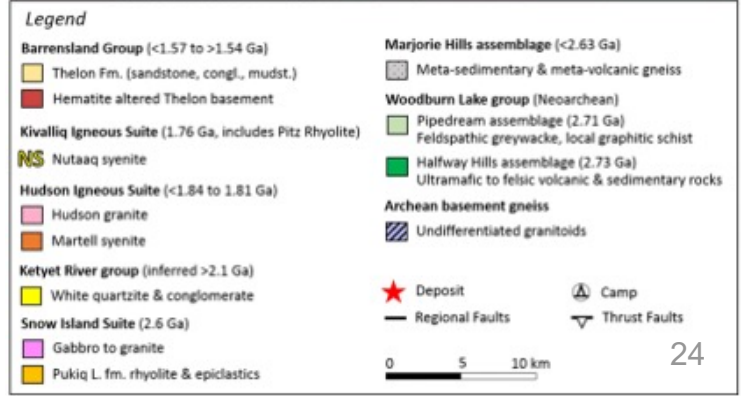
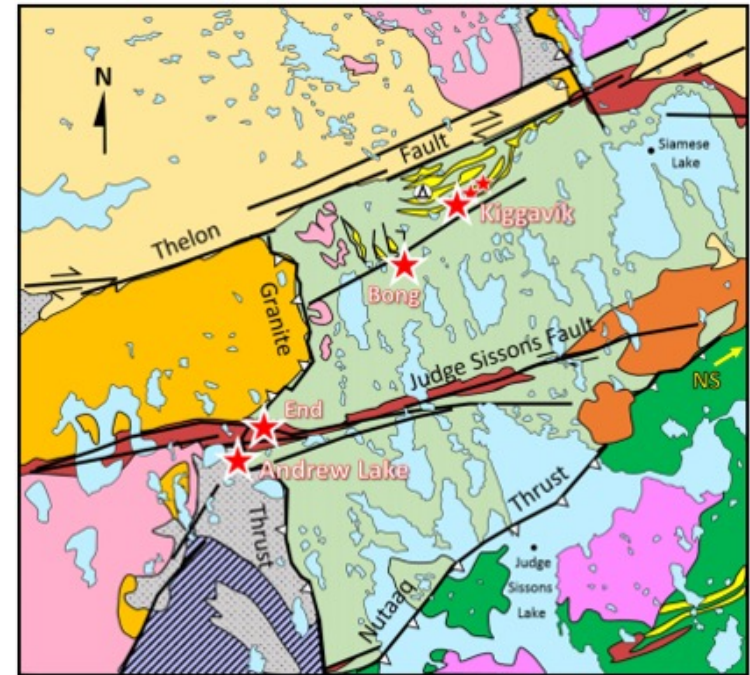
# Uranium in NU - Deposits





# Uranium in NU – Kiggavik Deposit

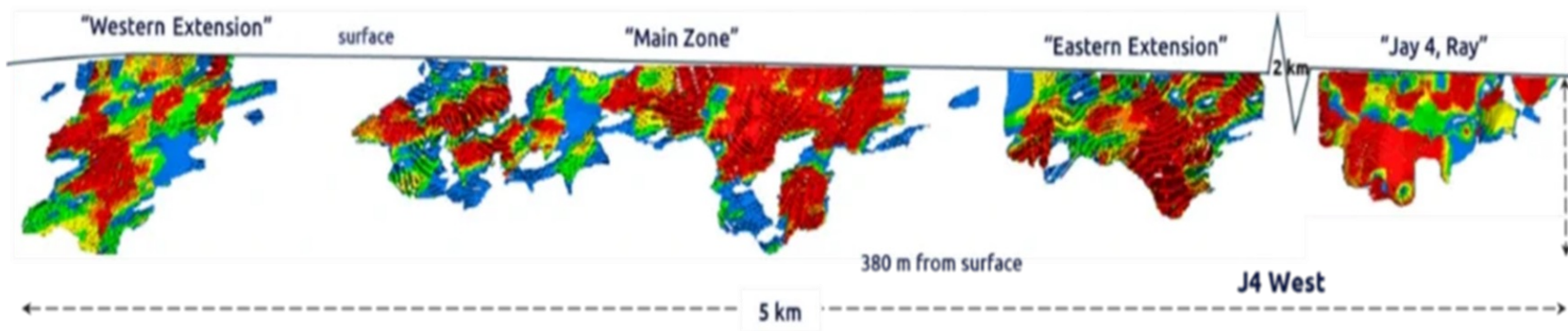
- South-eastern edge of the Thelon Basin.
- ±30-km-long NE–SW Kiggavik-Andrew Lake structural trend.
- Basement-hosted
- Multiple styles of U mineralization and alteration.
- Minimum age of uraninite 1284 ±53 Ma, but possibly a reset due to Mackenzie Igneous event.





# Uranium in NU – Angilak Deposit

- Located in southern Kivalliq. Covers 68,552 hectares.
- Mineralization is structurally controlled, hosted in graphitic tuff units of Archean basement metavolcanics and metasediments.
- Mineralization in the Lac 50 occurs as five individual deposits
- Occur along a strike length of approximately five kilometres and have been drilled to a vertical depth of 385 metres.





## Benefits and Outlook

- Uranium is a critical mineral and is forecast to see increased demand in the near future.
- There are several proterozoic sedimentary uranium bearing basins in Nunavut with potential for investment.
- Large parts of Nunavut have seen only reconnaissance mapping.
- There is huge potential for greenfields discovery.
- Nunavut's unconformity related deposits are prospective for high grade uranium.





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