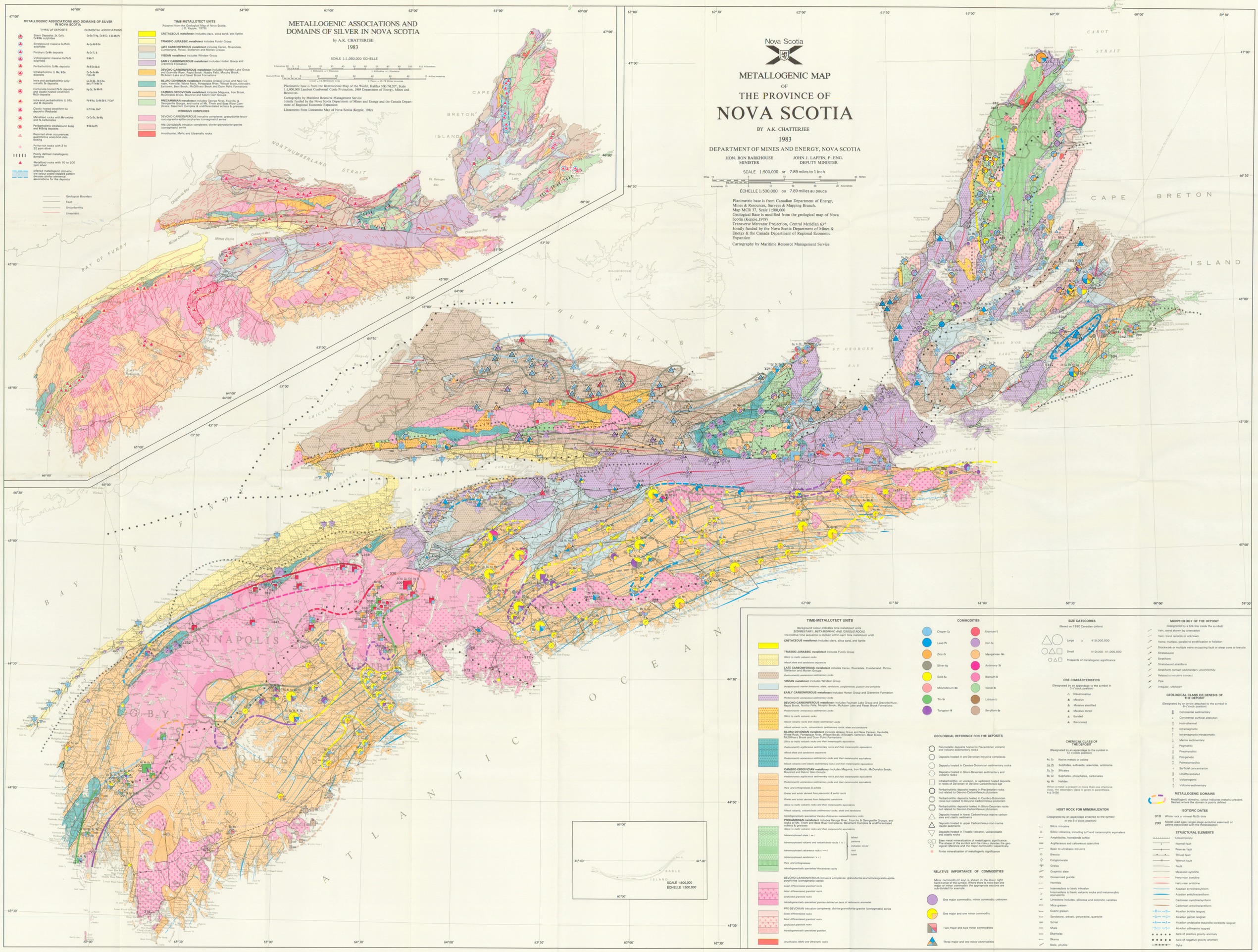
METALLOGENIC ASSOCIATIONS AND DOMAINS OF SILVER IN NOVA SCOTIA
by A.K. CHATTERJEE
1983
SCALE 1:1,000,000 ÉCHELLE
Planimetric base is from the International Map of the World, Halifax NK/NL20*, Scale 1:1,000,000 Lambert Conformal Conic Projection, 1969 Department of Energy, Mines and Resources.
Cartography by Maritime Resource Management Service
Jointly funded by the Nova Scotia Department of Mines and Energy and the Canada Department of Regional Economic Expansion
Lineaments from Lineament Map of Nova Scotia (Keppie, 1982)
METALLOGENIC ASSOCIATIONS AND DOMAINS OF SILVER IN NOVA SCOTIA
TYPES OF DEPOSITS
ELEMENTAL ASSOCIATIONS
Skarn Deposits: Zn, Cu-Fe, Cu-W-Mo sulphides
Cu-Co-Ti-Hg, Cu-Ni-Cr, V-Sn-Mo-Pb
Stratabound massive Cu-Pb-Zn sulphides
Au-Co-Ni-Bi-Sn
Porphyry Cu-Mo deposits
Au-Cr-Ti, B
Volcanogenic massive Cu-Pb-Zn sulphides
B-Mn-Ti
Peribatholithic Cu-Mo deposits
As-Bi-Sn-Sb-B
Intrabatholithic U, Mo, W-Sn deposits
Cu-Zn-Sn-Mn F-B-U-Rb
Intra and peribatholithic poly-metallic Sn deposits
Cu-Zn-Sb, Bi-In-As, Be-Li-F-Th-Nb-Ta
Carbonate-hosted Pb-Zn deposits and clastic-hosted stratiform Pb-Zn deposits
Hg-Cd, Ba-Mn-Bi
Intra-and peribatholithic U, U-Cu, and Sn deposits
Pb-W-As, Cu-Ni-Sb-V, F-Cu-P
Clastic hosted stratiform Cu deposits (Redbeds)
U-P-V-Ba, Ba-P
Metallized rocks with Mn-oxides and Fe-carbonates
Co-Cu-Zn, Ba-Mg
Peribatholithic stratabound Au-Ag and W-Sb-Ag deposits
W-Sb-As-Pb
Reported silver occurrences, quantitative analytical data lacking
Pyrite-rich rocks with 3 to 20 ppm silver
Poorly defined metallogenic domains
Metallized rocks with 10 to 200 ppm silver
Inferred metallogenic domains, the colour coded stippled pattern denotes similar elemental associations for the deposits
Geological Boundary
Fault
Unconformity
Lineaments
TIME-METALLOTECT UNITS
(Adapted from the Geological Map of Nova Scotia, J.D. Keppie, 1979)
CRETACEOUS metallotect includes clays, silica sand, and lignite
TRIASSIC-JURASSIC metallotect includes Fundy Group
LATE CARBONIFEROUS metallotect includes Canso, Riversdale, Cumberland, Pictou, Stellarton and Morien Groups
VISEAN metallotect includes Windsor Group
EARLY CARBONIFEROUS metallotect includes Horton Group and Grantmire Formation
DEVONO-CARBONIFEROUS metallotect includes Fountain Lake Group and Granville River, Rapid Brook, Nuttby Falls, Murphy Brook, McAdam Lake and Fisset Brook Formations
SILURO-DEVONIAN metallotect includes Arisaig Group and New Canaan, Kentville, White Rock, Portapique River, Wilson Brook, Knoydart, Earltown, Bear Brook, McGillivary Brook and Dunn Point Formations
CAMBRO-ORDOVICIAN metallotect includes Megumia, Iron Brook, McDonalds Brook, Bouinot and Kelvin Glen Groups
PRECAMBRIAN metallotect includes George River, Fourchu & Georgeville Groups, and rocks of Mt. Thom and Bass River Complexes, Basement Complex & undifferentiated schists & gneisses
INTRUSIVE COMPLEXES
DEVONO-CARBONIFEROUS intrusive complexes: granodiorite-leuco-monozogranite-aplite-porphyries (comagmatic) series
PRE-DEVONIAN intrusive complexes: diorite-granodiorite-granite (comagmatic) series
Anorthosite, Mafic and Ultramafic rocks
Nova Scotia
METALLOGENIC MAP
OF
THE PROVINCE OF
NOVA SCOTIA
BY A.K. CHATTERJEE
1983
DEPARTMENT OF MINES AND ENERGY, NOVA SCOTIA
HON. RON BARKHOUSE
MINISTER
JOHN J. LAFFIN, P. ENG.
DEPUTY MINISTER
SCALE 1:500,000 or 7.89 miles to 1 inch
ÉCHELLE 1:500,000 ou 7.89 milles au pouce
Planimetric base is from Canadian Department of Energy, Mines & Resources, Surveys & Mapping Branch. Map MCR 37, Scale 1:500,000
Geological Base is modified from the geological map of Nova Scotia (Keppie,1979)
Transverse Mercator Projection, Central Meridian 63°
Jointly funded by the Nova Scotia Department of Mines & Energy & the Canada Department of Regional Economic Expansion
Cartography by Maritime Resource Management Service
TIME-METALLOTECT UNITS
Background colour indicates time-metallotect units
SEDIMENTARY, METAMORPHIC AND IGNEOUS ROCKS
(no relative time sequence is implied within each time metallotect unit)
CRETACEOUS metallotect includes clays, silica sand, and lignite
TRIASSIC-JURASSIC metallotect includes Fundy Group
Silicic to mafic volcanic rocks
Mixed shale and sandstone sequences
LATE CARBONIFEROUS metallotect includes Canso, Riversdale, Cumberland, Pictou, Stellarton and Morien Groups
Predominantly arenaceous sedimentary rocks
VISEAN metallotect includes Windsor Group
Predominantly marine limestone, shale, sandstone, conglomerate, gypsum and anhydrite
EARLY CARBONIFEROUS metallotect includes Horton Group and Grantmire Formation
Predominantly arenaceous sedimentary rocks
DEVONO-CARBONIFEROUS metallotect includes Fountain Lake Group and Granville River, Rapid Brook, Nuttby Falls, Murphy Brook, McAdam Lake and Fisset Brook Formations
Predominantly arenaceous sedimentary rocks
Silicic to mafic volcanic rocks
Mixed volcanic rocks and clastic sedimentary rocks
Mixed volcanic rocks, volcaniclastic sedimentary rocks, shale and sandstone
SILURO-DEVONIAN metallotect includes Arisaig Group and New Canaan, Kentville, White Rock, Portapique River, Wilson Brook, Knoydart, Earltown, Bear Brook, McGillivary Brook and Dunn Point Formations
Silicic to mafic volcanic rocks and their metamorphic equivalents
Predominantly argillaceous sedimentary rocks and their metamorphic equivalents
Mixed shale and sandstone sequences
Predominantly arenaceous sedimentary rocks and their metamorphic equivalents
Mixed volcanics and clastic sedimentary rocks and their metamorphic equivalents
CAMBRO-ORDOVICIAN metallotect includes Megumia, Iron Brook, McDonalds Brook, Bouinot and Kelvin Glen Groups
Predominantly argillaceous sedimentary rocks and their metamorphic equivalents
Predominantly arenaceous sedimentary rocks and their metamorphic equivalents
Para- and orthogneisses & schists
Gneiss and schist derived from psammitic & pelitic rocks
Gneiss and schist derived from feldspathic sandstone
Silicic to mafic volcanic rocks and their metamorphic equivalents
Mixed volcanic, volcaniclastic sedimentary rocks, shale and sandstone
Metallogenetically specialized Cambro-Ordovician metasedimentary rocks
PRECAMBRIAN metallotect includes George River, Fourchu & Georgeville Groups, and rocks of Mt. Thom and Bass River Complexes, Basement Complex & undifferentiated schists & gneisses
Silicic to mafic volcanic rocks and their metamorphic equivalents
Metamorphosed shale (—)
Metamorphosed volcanic and volcaniclastic rocks (V)
Metamorphosed calcareous rocks (—·—)
Metamorphosed sandstone (• •)
Mixed patterns indicates mixed rock types
Para- and orthogneisses
Metallogenetically specialized Precambrian rocks
DEVONO-CARBONIFEROUS intrusive complexes: granodiorite-leucomonozogranite-aplite-porphyries (comagmatic) series
Least differentiated granitoid rocks
Most differentiated granitoid rocks
Undivided granitoid rocks
Metallogenetically specialized granites defined on basis of radiometric anomalies
PRE-DEVONIAN intrusive complexes: diorite-granodiorite-granite (comagmatic) series
Least differentiated rocks
Most differentiated granitoid rocks
Undivided granitoid rocks
Metallogenetically specialized granites
Anorthosite, Mafic and Ultramafic rocks
COMMODITIES
Copper-Cu
Lead-Pb
Zinc-Zn
Silver-Ag
Gold-Au
Molybdenum-Mo
Tin-Sn
Tungsten-W
Uranium-U
Iron-Fe
Manganese- Mn
Antimony- Sb
Bismuth-Bi
Nickel-Ni
Lithium-Li
Beryllium-Be
GEOLOGICAL REFERENCE FOR THE DEPOSITS
Polymetallic deposits hosted in Precambrian volcanic and volcano-sedimentary rocks
Deposits hosted in pre-Devonian intrusive complexes
Deposits hosted in Cambro-Ordovician sedimentary rocks
Deposits hosted in Siluro-Devonian sedimentary and volcanic rocks
Intrabatholithic, or volcanic, or sediment hosted deposits in rocks of Devonian or Devono-Carboniferous age
Peribatholithic deposits hosted in Precambrian rocks but related to Devono-Carboniferous plutonism
Peribatholithic deposits hosted in Cambro-Ordovician rocks but related to Devono-Carboniferous plutonism
Peribatholithic deposits hosted in Siluro-Devonian rocks but related to Devono-Carboniferous plutonism
Deposits hosted in lower Carboniferous marine carbonates and clastic sediments
Deposits hosted in upper Carboniferous non-marine clastic sediments
Deposits hosted in Triassic volcanic, volcaniclastic and clastic rocks
Base metal mineralization of metallogenic significance. The shape of the symbol and the colour denotes the geological reference and the major commodity respectively.
Pyrite mineralization of metallogenic significance
RELATIVE IMPORTANCE OF COMMODITIES
Minor commodity (if any) is shown in the lower right hand corner of the symbol. Where there is more than one major or minor commodity the appropriate sections are sub-divided for example:
One major commodity, minor commodity unknown
One major and one minor commodity
Two major and two minor commodities
Three major and one minor commodities
SIZE CATEGORIES
(Based on 1980 Canadian dollars)
Large > $10,000,000
Small $10,000 - $1,000,000
Prospects of metallogenic significance
ORE CHARACTERISTICS
(Designated by an appendage to the symbol in 3 o'clock position)
Dissemination
Massive
Massive stratified
Massive zoned
Banded
Brecciated
CHEMICAL CLASS OF THE DEPOSIT
(Designated by an appendage to the symbol in 12 o'clock position)
Native metals or oxides
Sulphides, sulfosalts, arsenides, antimonia
Silicates
Sulphates, phosphates, carbonates
Halides
When a metal is present in more than one chemical class, the secondary class is given in parenthesis. e.g. Sn (Sn)
HOST ROCK FOR MINERALIZATON
(Designated by an appendage attached to the symbol in the 9 o'clock position)
Silicic intrusive
Silicic volcanics, including tuff and metamorphic equivalent
Amphibolite, hornblende schist
Argillaceous and calcareous quartzites
Basic to ultrabasic intrusive
Breccia
Conglomerate
Gneiss
Graphitic slate
Greisenized granite
Hornfels
Intermediate to basic intrusive
Intermediate to basic volcanic rocks and metamorphic equivalents
Limestone includes, siliceous and dolomitic varieties
Mica gneisen
Quartz gneisen
Sandstone, arkose, greywacke, quartzite
Schist
Shale
Skarnoids
Skarns
Slate, phyllite
MORPHOLOGY OF THE DEPOSIT
(Designated by a tick line inside the symbol)
Vein, trend shown by orientation
Vein, trend random or unknown
Veins; multiple, parallel to stratification or foliation
Stockwork or multiple veins occupying fault or shear zone or breccia
Stratabound
Stratiform
Stratabound stratiform
Stratiform contact sedimentary unconformity
Related to intrusive contact
Pipe
Irregular, unknown
GEOLOGICAL CLASS OR GENESIS OF THE DEPOSIT
(Designated by an arrow attached to the symbol in 6 o'clock position)
Continental sedimentary
Continental surficial alteration
Hydrothermal
Intrasmagmatic
Intramagmatic-metasomatic
Marine sedimentary
Pegmatitic
Pneumatolitic
Polygenetic
Polmetamorphic
Surficial concentration
Undifferentiated
Volcanogenic
Volcano-sedimentary
METALLOGENIC DOMAINS
Metallogenic domains, colour indicates metal(s) present. Dashed where the domain is poorly defined.
ISOTOPIC DATES
319 Whole rock or mineral Rb/Sr date
290 Model Lead ages (single-stage evolution assumed) of galena associated with the mineralization
STRUCTURAL ELEMENTS
Unconformity
Normal fault
Reverse fault
Thrust fault
Wrench fault
Fault
Mesozoic syncline
Hercynian syncline
Hercynian anticline
Acadian syncline/synform
Acadian anticline/antiform
Cadomian syncline/synform
Cadomian anticline/antiform
Acadian biotite isograd
Acadian garnet isograd
Acadian andalusite-staurolite-cordierite isograd
Acadian sillimanite isograd
Axis of positive gravity anomaly
Axis of negative gravity anomaly
Dyke
BAY OF FUNDY
NORTHUMBERLAND STRAIT
CAPE BRETON ISLAND
ATLANTIC OCEAN
ANNAPOLIS
DIGBY
MOUTH OF QUEENS
SABLE ISLAND
SCALE 1:500,000
ÉCHELLE 1:500,000