



Geoscience Supporting Exploration and Mine Development in British Columbia

PDAC March 2005
by Brian Grant, PGeo



PDAC Booth 732

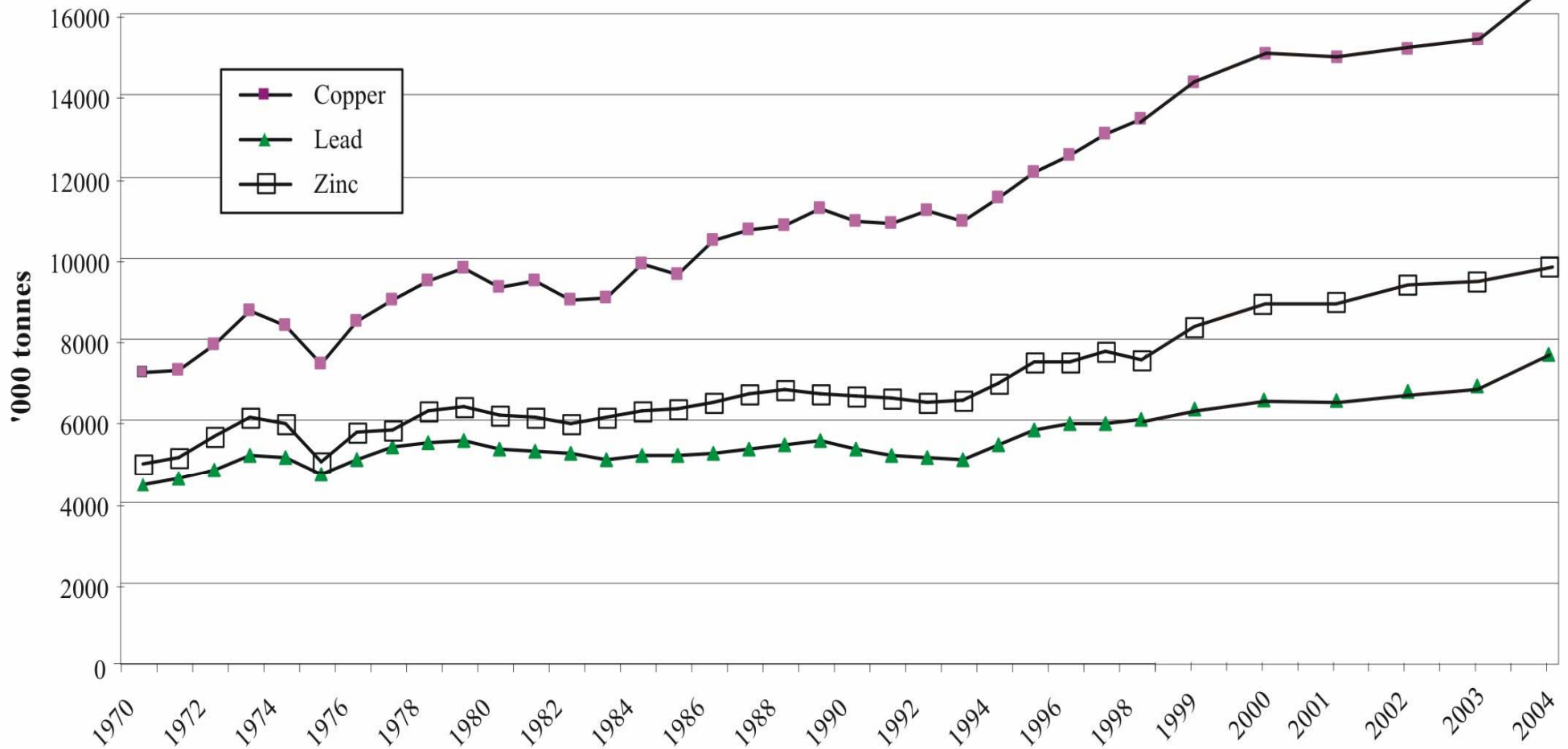


Topics

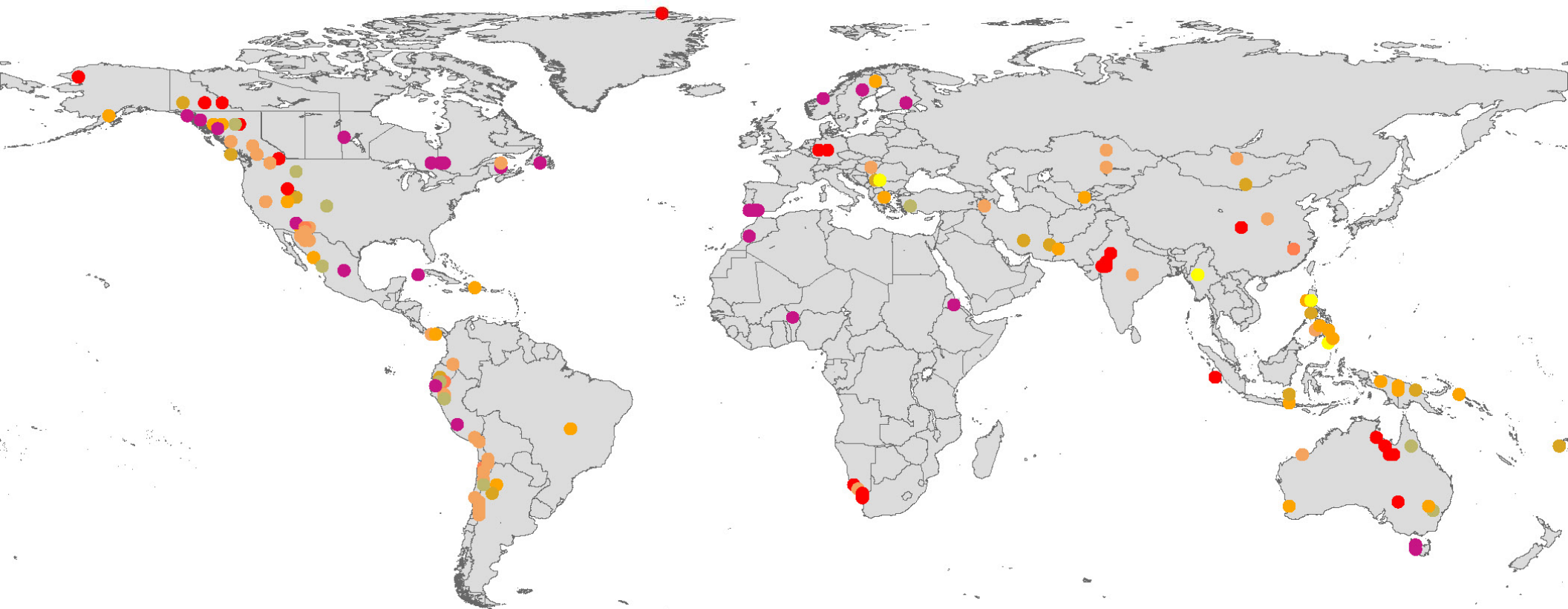
- Mining & Mineral Exploration Activity
- BC Geological Survey Program
- Geoscience data for Explorationists
- Geoscience NEWS!

Global Trends : Demand

Global Base Metal Consumption 1970-2004

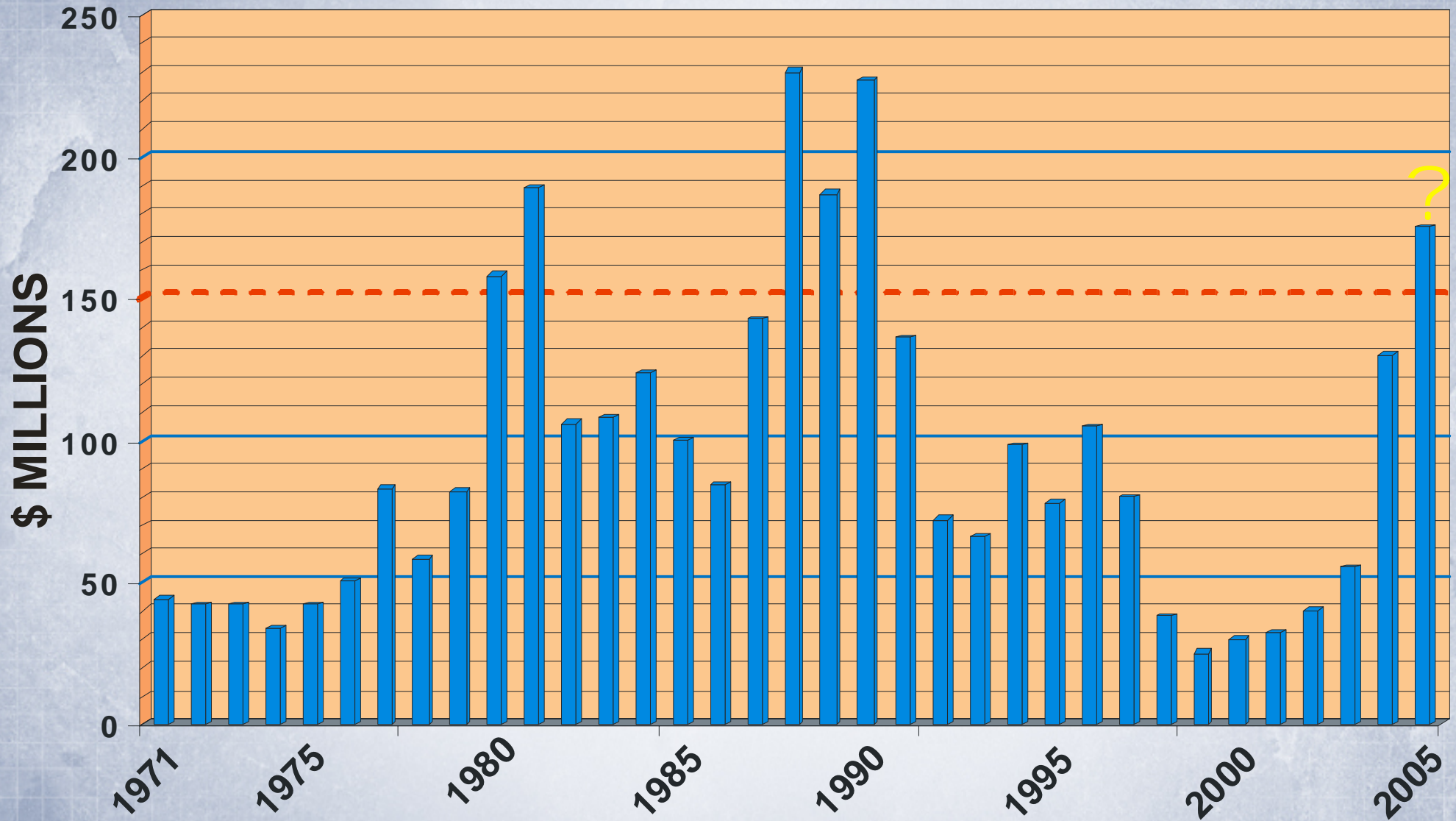


World's Large and Giant Copper & Gold Ore Deposits

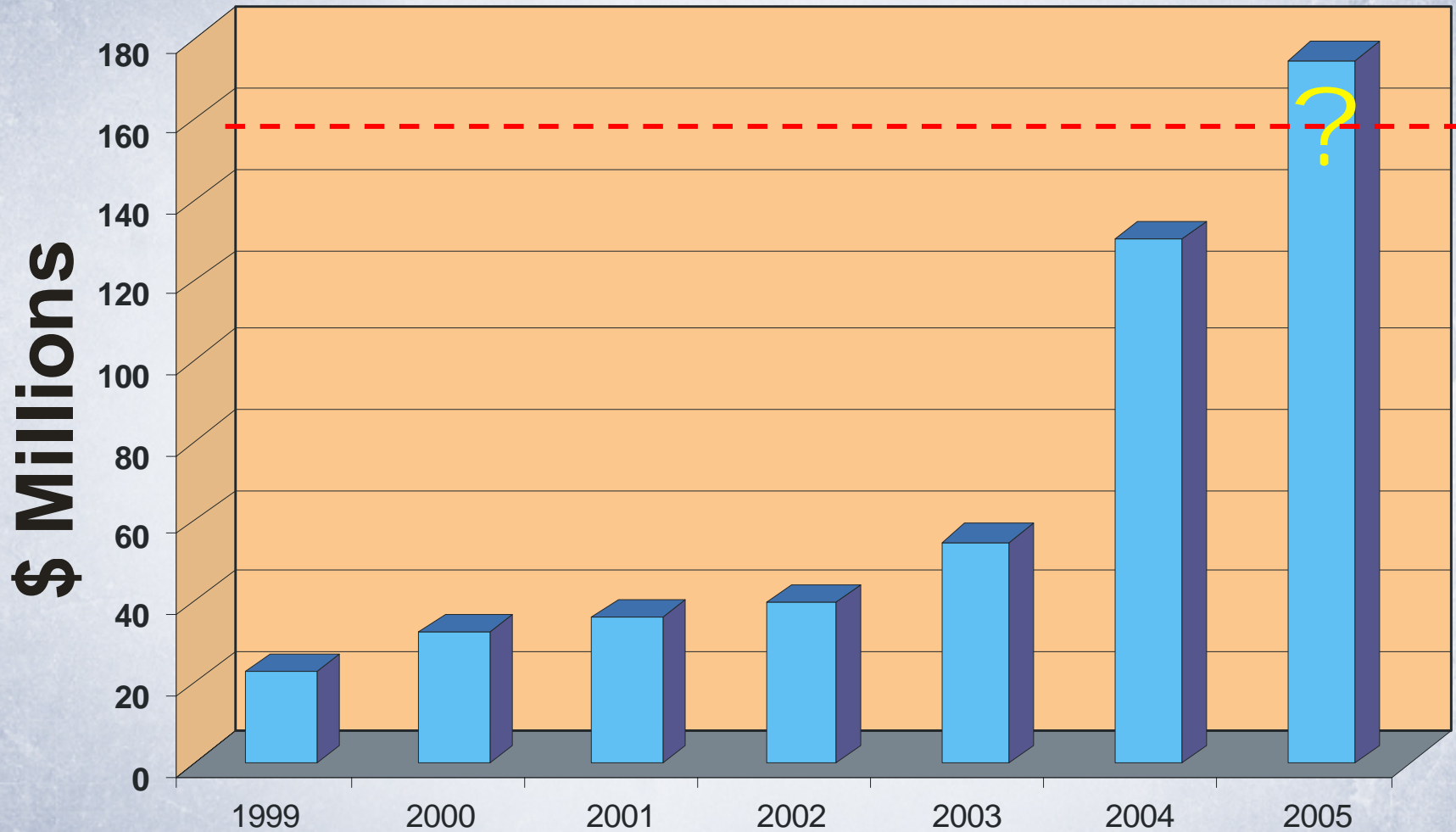


Large&GiantDepositLocation	
● yellow	epithermal copper (gold, silver)
● orange	porphyry copper
● light orange	porphyry copper, gold
● dark orange	porphyry copper, gold, molybdenum
● light green	porphyry copper, molybdenum
● olive green	porphyry gold
● red	sedimentary exhalative sulphide
● purple	volcanic-associated massive sulphide

BC Exploration Investment 1971-2005



BC Exploration Investment 1999-2005



Operating Mines 2004



British Columbia Mines and Major Exploration Projects 2004

Top 100 Exploration Projects

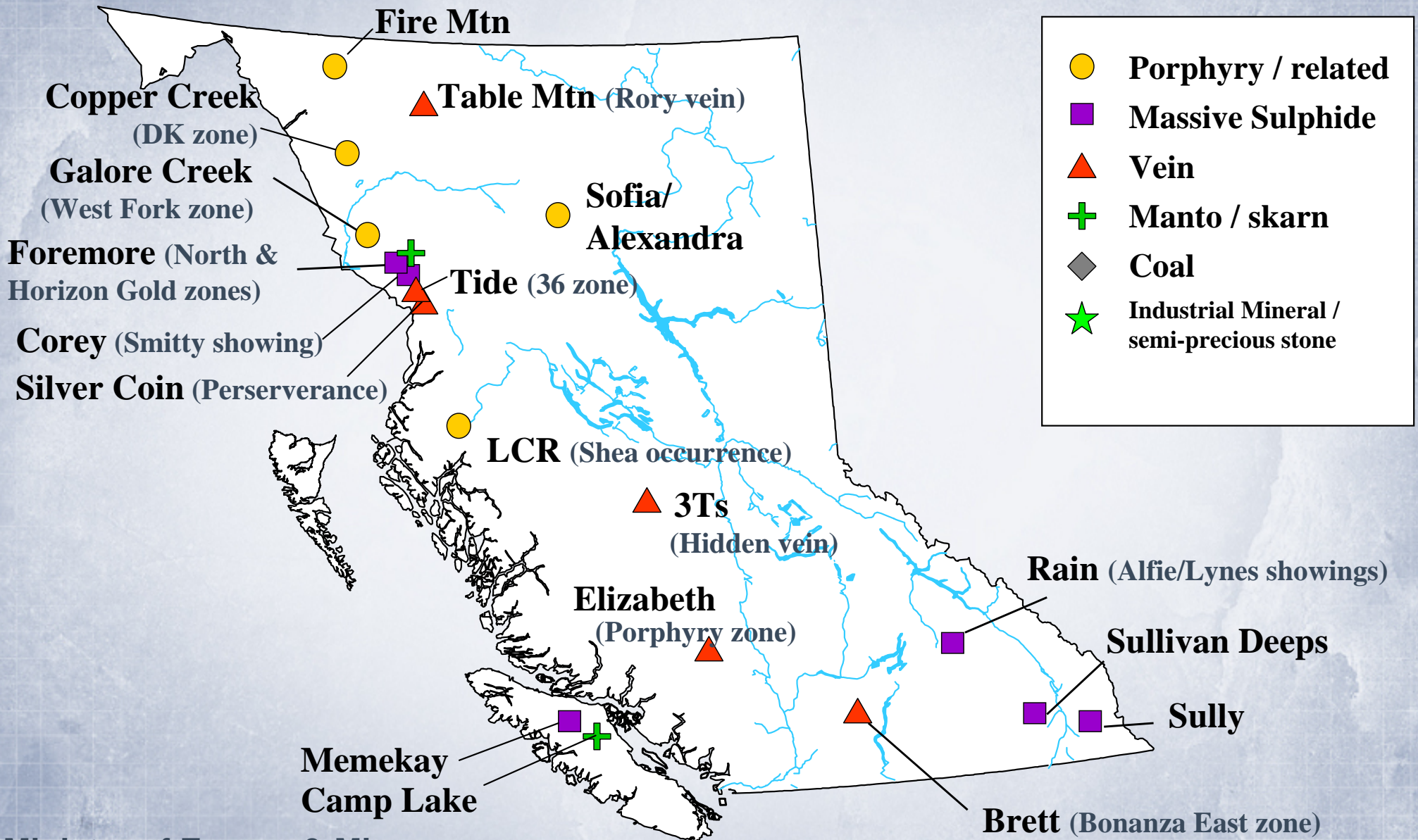
- Porphyry / related
- Massive sulphide
- ▲ Vein
- + Skarn / manto
- Coal
- x Magmatic







Industrial Minerals commodity codes

- At - Aggregate
- Ba - Barite
- Bn - Bentonite
- Bu - Building stone
- Cy - Clay
- Do - Dolomite
- Fr - Fullers Earth
- Gy - Gypsum
- Ls - Limestone
- Ma - Magnetite
- Mt - Magnesite
- Mw - Mineral wool
- Pu - Pumice
- Sh - Shale
- Si - Silica
- Ze - Zeolite



20 New Discoveries - 2004



	Porphyry / related
	Massive Sulphide
	Vein
	Manto / skarn
	Coal
	Industrial Mineral / semi-precious stone

Potential New Development Projects

2004

Tulsequah Chief

Galore Creek

Table Mtn

Red Chris
Mt Klappan

Kemess North

Sustut Copper

Morrison

Wolverine
Trend

Cariboo Gold

QR

Mount Polley

Bralorne

Afton

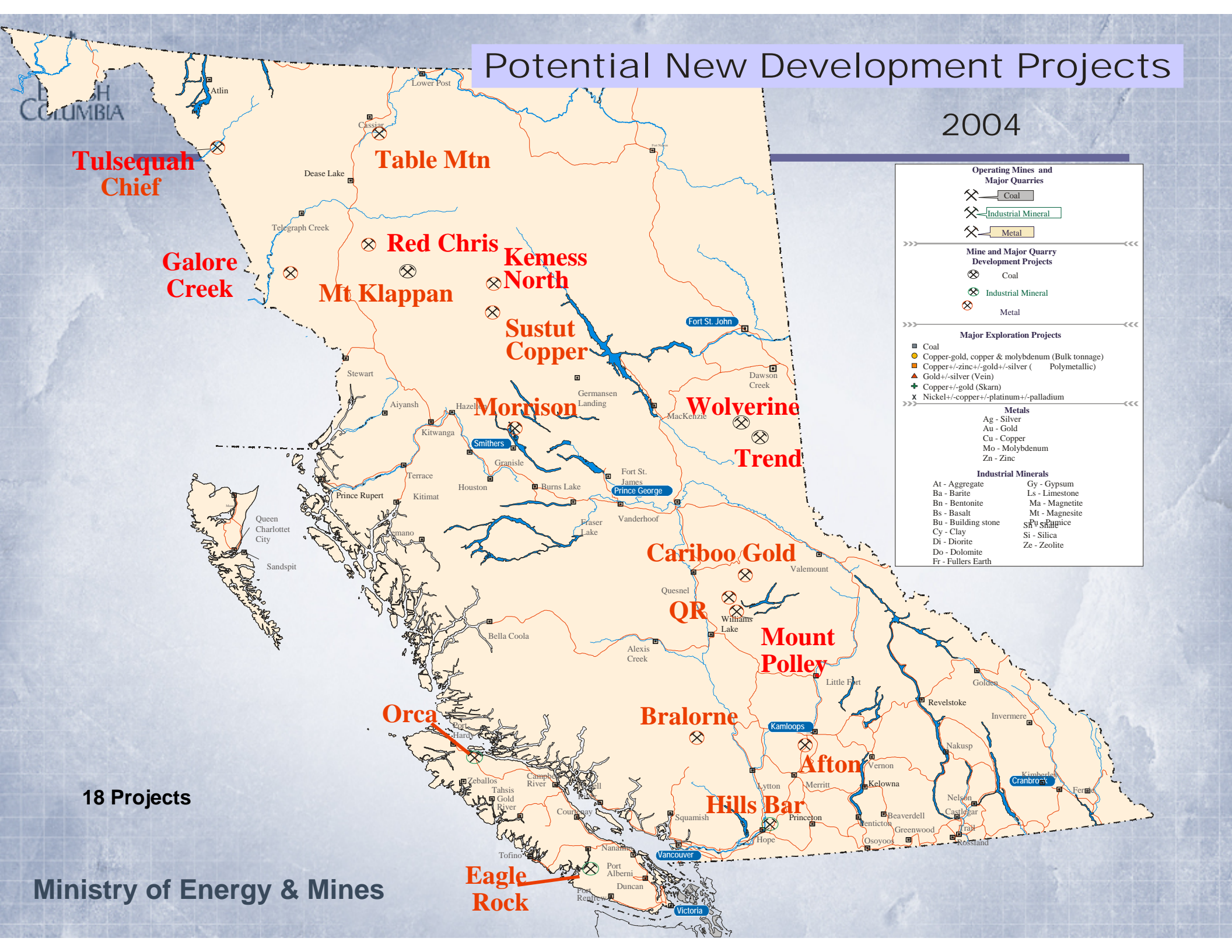
Hills Bar

Eagle Rock

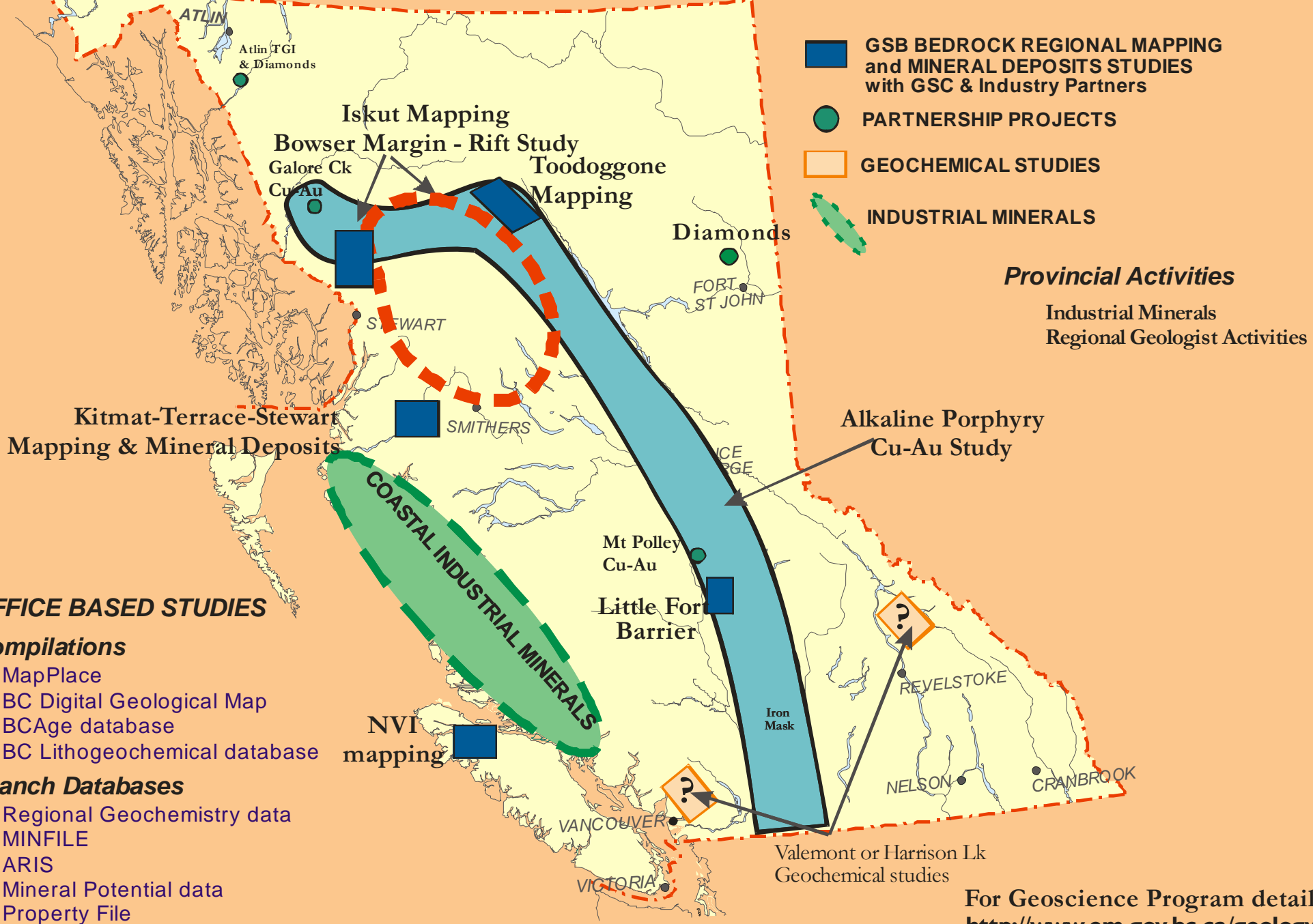
Operating Mines and Major Quarries	
	Coal
	Industrial Mineral
	Metal
Mine and Major Quarry Development Projects	
	Coal
	Industrial Mineral
	Metal
Major Exploration Projects	
	Coal
	Copper-gold, copper & molybdenum (Bulk tonnage)
	Copper +/- zinc +/- gold +/- silver (Polymetallic)
	Gold +/- silver (Vein)
	Copper +/- gold (Skarn)
	Nickel +/- copper +/- platinum +/- palladium
Metals	
Ag	Silver
Au	Gold
Cu	Copper
Mo	Molybdenum
Zn	Zinc
Industrial Minerals	
At	Aggregate
Ba	Barite
Bn	Bentonite
Bs	Basalt
Bu	Building stone
Cy	Clay
Di	Diorite
Do	Dolomite
Fr	Fullers Earth
Gy	Gypsum
Ls	Limestone
Ma	Magnetite
Mt	Magnetite
Sp	Spinel
Si	Silica
Ze	Zeolite

18 Projects

Ministry of Energy & Mines



British Columbia Geological Survey Branch PRELIMINARY 2005 Field Program



OFFICE BASED STUDIES

Compilations

- MapPlace
- BC Digital Geological Map
- BCAGE database
- BC Litho-geochemical database

Branch Databases

- Regional Geochemistry data
- MINFILE
- ARIS
- Mineral Potential data
- Property File

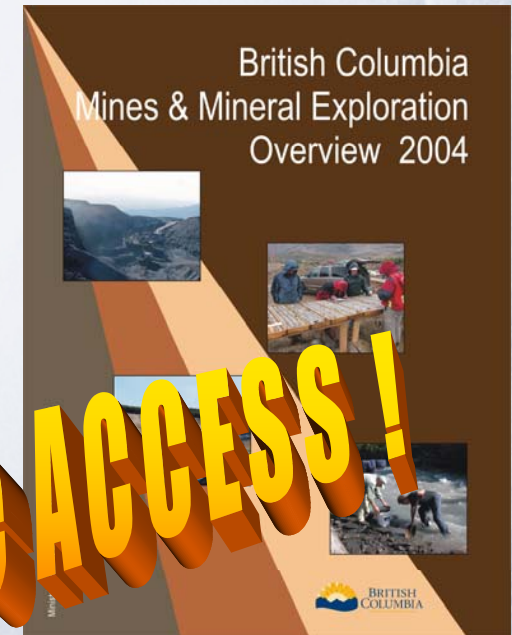
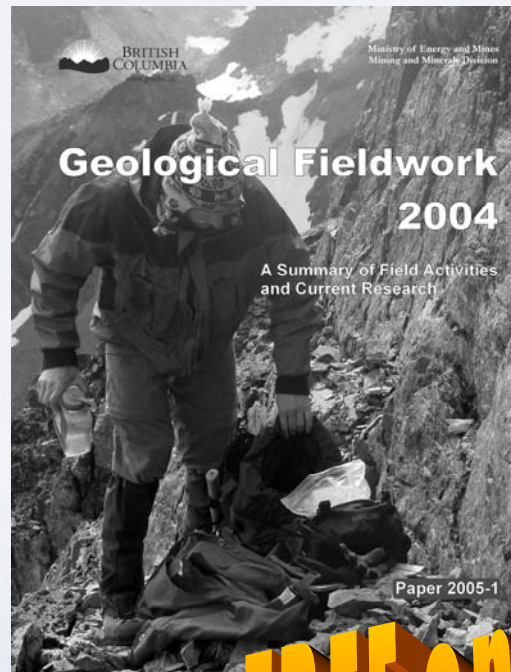
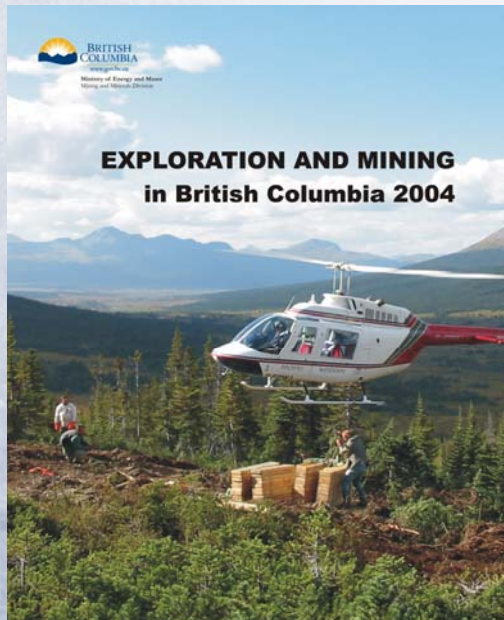
Provincial Activities

- Industrial Minerals
- Regional Geologist Activities

For Geoscience Program details see:
<http://www.em.gov.bc.ca/geology>

Geoscience Publications

- Geological Maps & Reports ~ 3000+ publications
- Ministry Website ~ 12 000 pages
- Geological Fieldwork 1200+ manuscripts
- Annual Reports 1874-2005 130+ reports



FREE online ACCESS!

Geoscience Digital Data

- **MapPlace** 4 million hits/year + 100s of themes
- **Mineral Deposit Profiles** ~ 90 descriptions
- **BC Digital Geology map** ~ 2318+ codes / 28 438+ polygons
- **Minfile** ~ 12 182 descriptions
- **ARIS** ~ 27 617 EXPLORATION reports
- **BCAge database** ~ 7800 records
- **BC Lithogeochemical database** ~ 9000+ records
- **COALFile** ~ 850 reports / 10 000 boreholes
- **RGS data** ~ 56 000 geochemical samples
- **Mineral Potential** ~ 3823 polygons / 150 tracts

FREE ACCESS!

"Best site in the world for a geologist."

3 components of MapPlace:

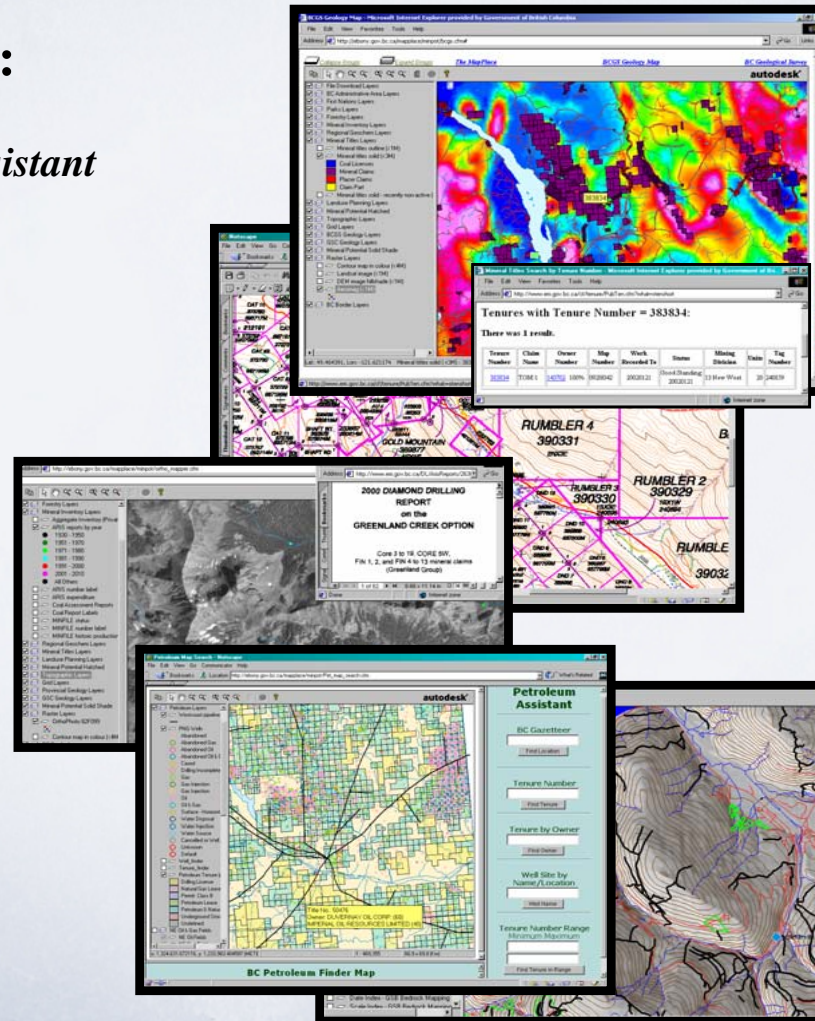
- main map site – *BCGS Geology*
- search / display – *Exploration Assistant*
- search / display – *Mineral Titles*

Over 4 Million hits a year!

"It has become a valuable tool for many of us in the minerals business."

"I can do research in one evening on your web site, that once took 2 weeks in the library."

"The most impressive site I have ever seen."



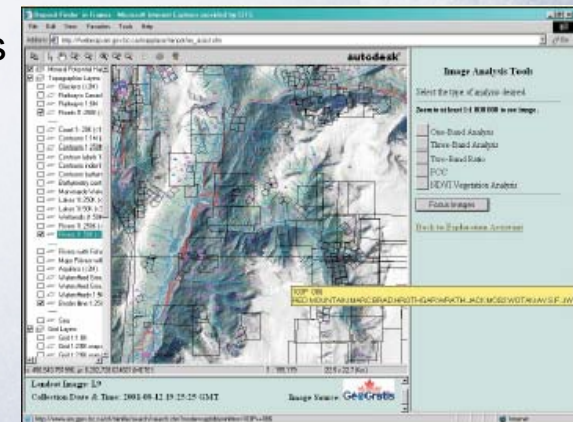
New on MapPlace in 2004

New On MapPlace for 2004

- ✓ **New BC Digital Geology Map !**
- ✓ Updated publication catalogue with footprints
- ✓ **48 Landsat and 40 Aster images**
- ✓ new Aggregate information
- ✓ BC Age Geochronology Database
- ✓ Old Growth Management Areas
- ✓ Orthophoto Mosaics
- ✓ **Archived Geophysical Survey footprints and links to data**
- ✓ **Mineral Titles Online grid**
- ✓ Geochemical Anomaly clusters
- ✓ Prospector Reports
- ✓ **Quesnel and Toodoggone geophysical surveys**

Functional Improvements:

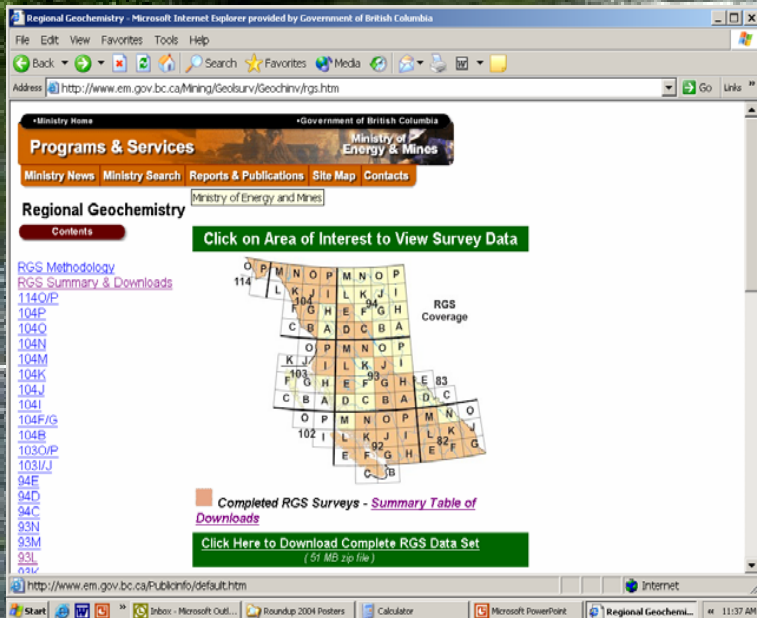
- ✓ Publications Search tool (CKMS)
- ✓ 2 NEW Image analyses functions
- ✓ **MapperWrapper tool updates with on-line base-maps, a new Unpluggler tool and a Users Manual.**
- ✓ Geochemistry Symbol Resizing tool
- ✓ Link to Corporate Land Resource Data Warehouse
- ✓ Mineral Properties Available in BC form and map
- ✓ Push-button Geology Legend
- ✓ Historic Mines Atlas



Claims in the Stewart Area; example of the Image Analysis Tools

RGS – Regional Geochemical Survey

- Over 70% of province covered by 1:250 000 map sheet surveys
- ~56 000+ geochemical samples & results
- View in MapPlace or download data free

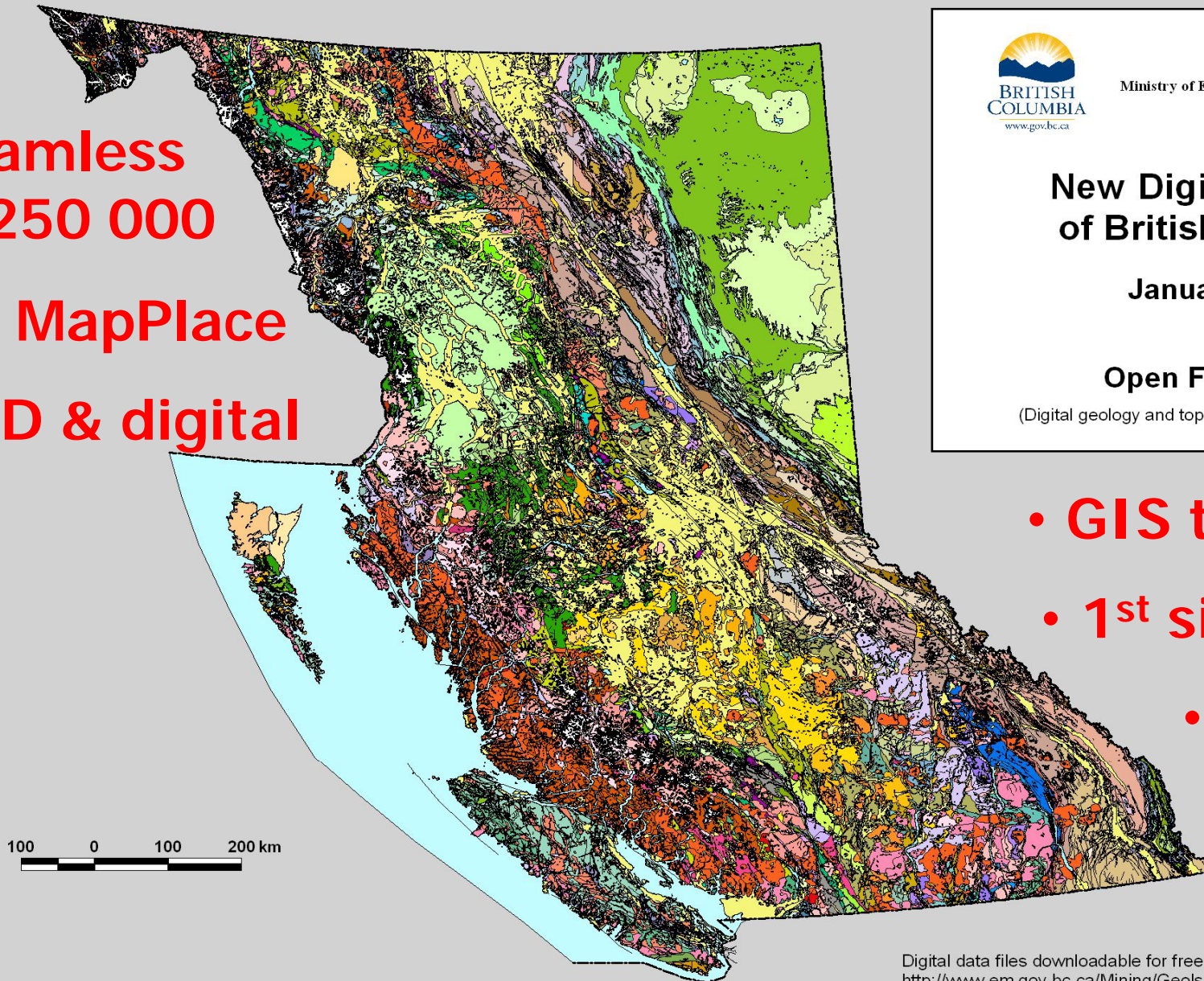


Other geochemical surveys:
Till sediment
Lake sediment / water
Focussed stream surveys



BC Digital Geology Map

- Seamless
1:250 000
- On MapPlace
- DVD & digital



Ministry of Energy and Mines



New Digital Geology of British Columbia

January 2005

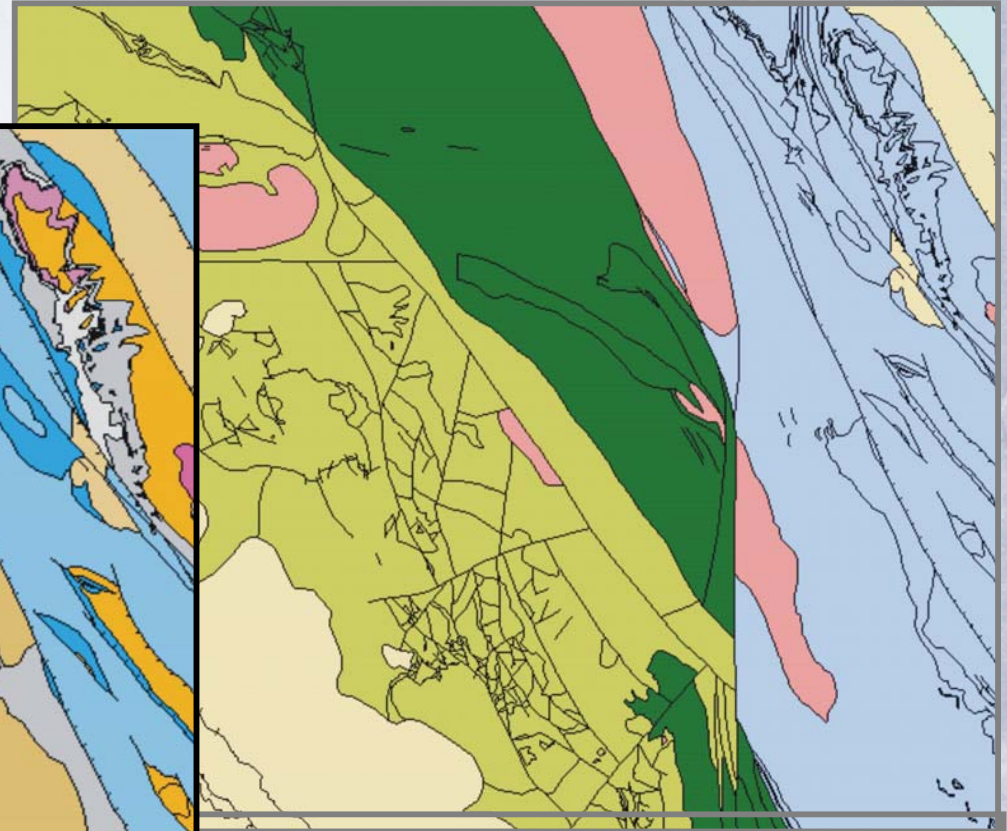
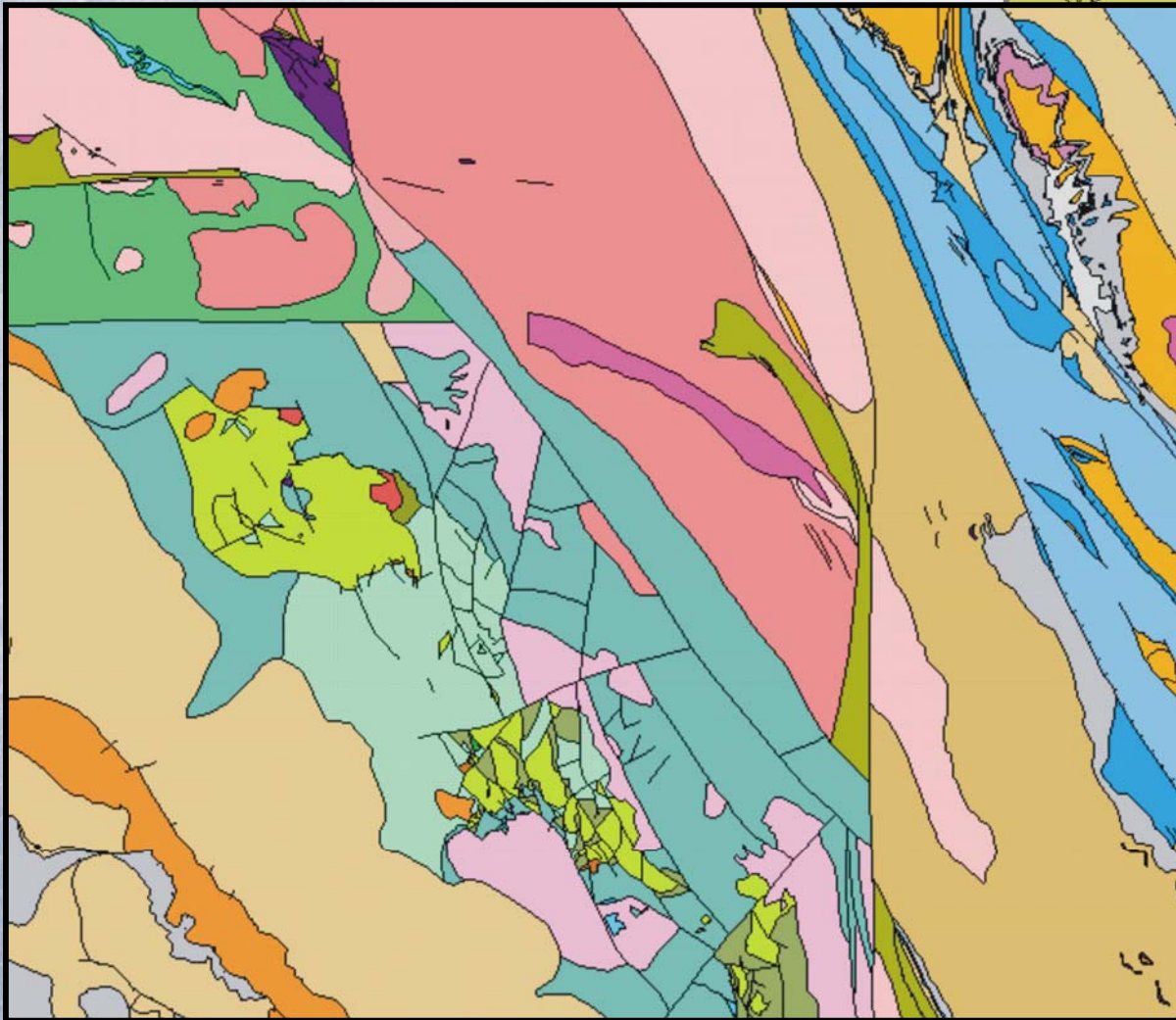
Open File 2005-2

(Digital geology and topography in shapefile format)

- GIS technology
- 1st since 1970s
- Lithology based vs terranes

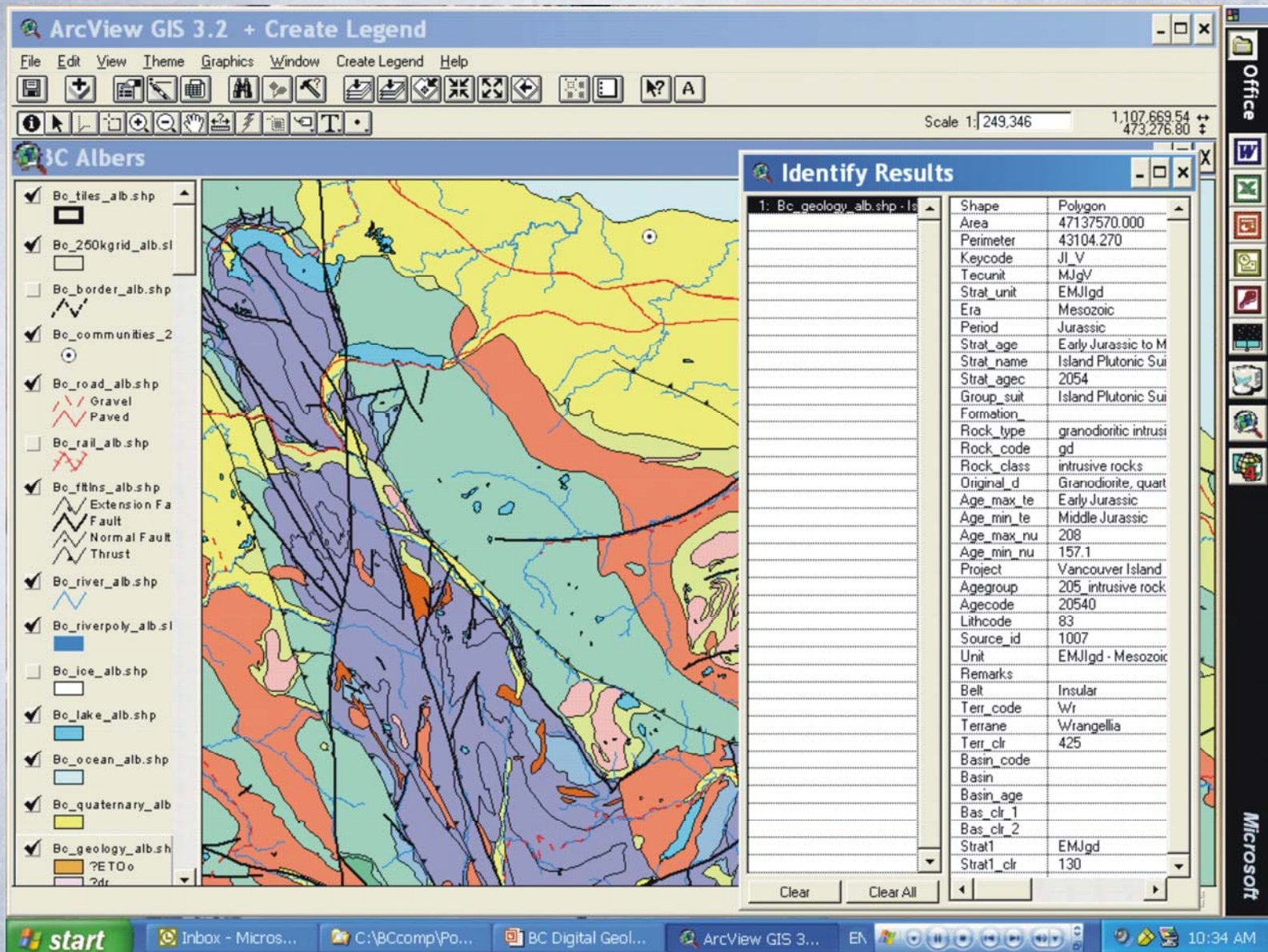
BC Digital Geology Map

**New Provincial Map is
Based on Lithology**



**Older Map is based
on Terranes**

Extensive Attribute Data



The screenshot shows the ArcView GIS 3.2 interface with a map of British Columbia. The map displays various geological features and land use patterns. The Identify Results window is open, showing detailed attribute data for a selected polygon.

Identify Results

Shape	Polygon
Area	47137570.000
Perimeter	43104.270
Keycode	JL V
Tecunit	MJgV
Strat_unit	EMJlgd
Era	Mesozoic
Period	Jurassic
Strat_age	Early Jurassic to M
Strat_name	Island Plutonic Sui
Strat_agec	2054
Group_suit	Island Plutonic Sui
Formation	
Rock_type	granodioritic intrusi
Rock_code	gd
Rock_class	intrusive rocks
Original_d	Granodiorite, quart
Age_max_te	Early Jurassic
Age_min_te	Middle Jurassic
Age_max_nu	208
Age_min_nu	157.1
Project	Vancouver Island
Agegroup	205 intrusive rock
Agecode	20540
Lithcode	83
Source_id	1007
Unit	EMJlgd - Mesozoic
Remarks	
Belt	Insular
Terr_code	Wr
Terrane	Wrangellia
Terr_clr	425
Basin_code	
Basin	
Basin_age	
Bas_clr_1	
Bas_clr_2	
Strat1	EMJlgd
Strat1_clr	130

New Rock Geochem Database

- 9000 BC Geological Survey rock samples
- High quality data
- Includes XRF major oxide, minor element, base and precious metals

- GSB will continue to expand the data set



BC Geoscience News !



**Geoscience Information
Leads to New Opportunities !**

Mineral Titles Online

Map Selection with Live Data

Mineral Titles Online - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print Mail

BRITISH COLUMBIA Mineral Titles Online Close X Help ?

About Debug Layers Legend Find Location **Select** Refresh Map Disclaimer

Map Layers ? HELP

- Mineral Titles
- Mineral Titles Grid *
- Mining Division *
- Reserves (Sites) *
- Mineral Tenures *

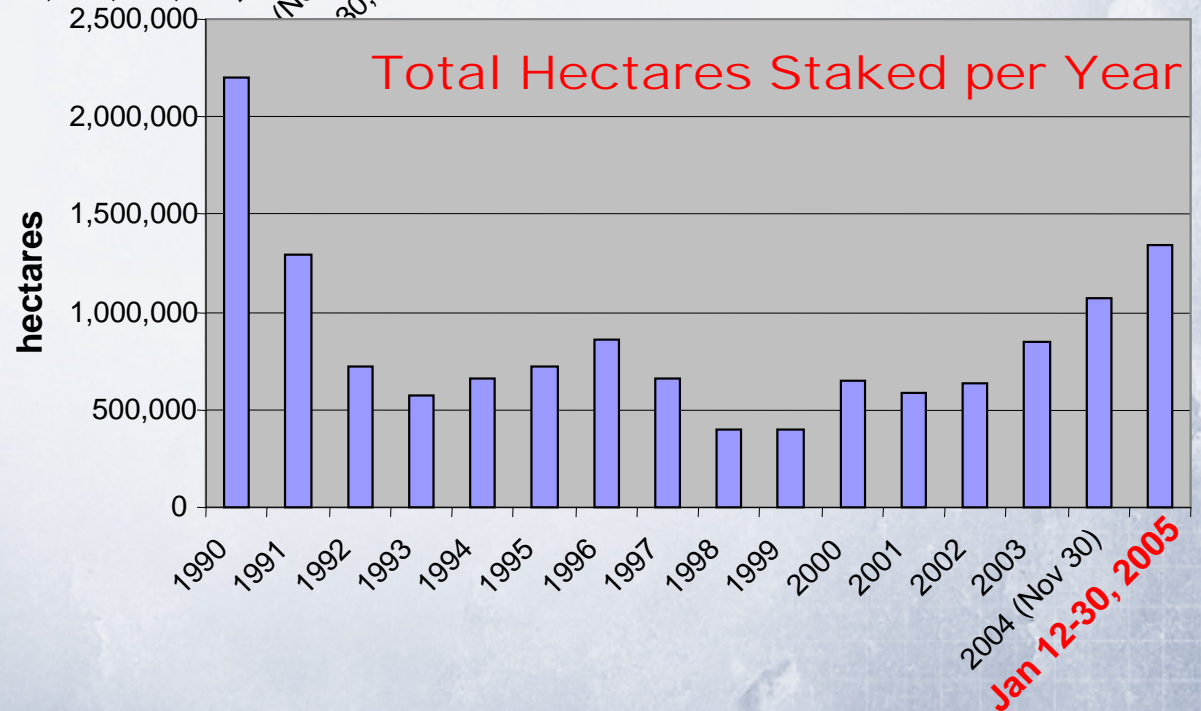
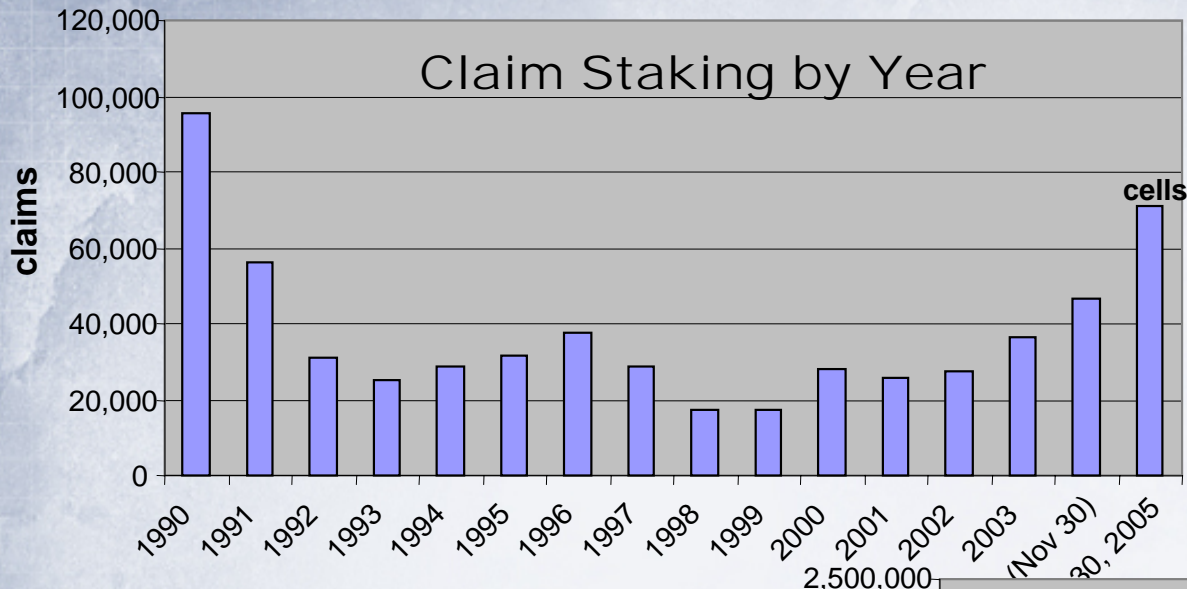
Mineral Titles Grid

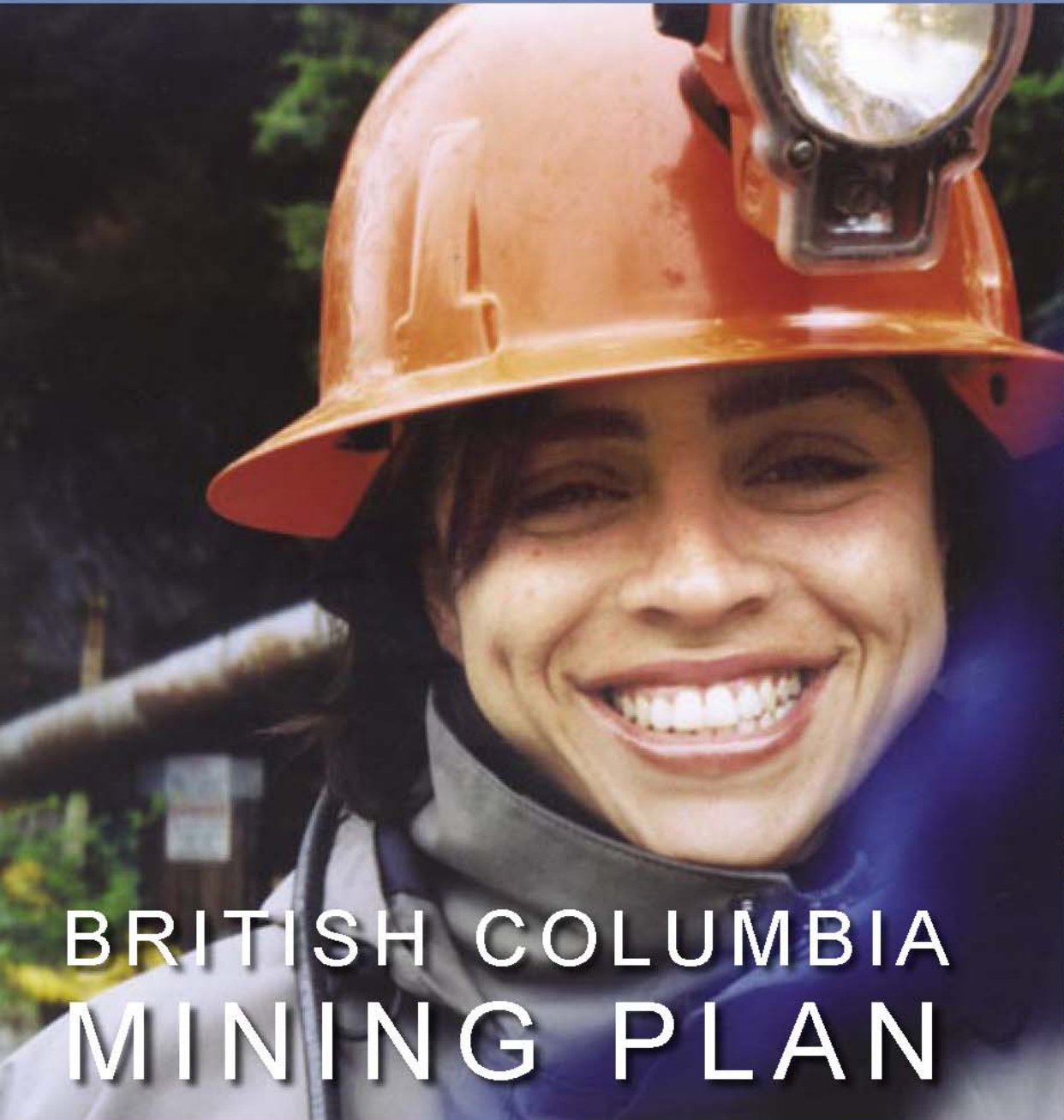
Inset Map: Improved land status information, UTM coordinate display of selection, Map selection area.

Map Center: 462461, 5466096 (zone 11)

Copyright © BC Ministry of Sustainable Resource Management

Mineral Titles Activity by Year





NEW Geoscience Funding

BC Geological Survey

- \$1.5+ Million for Geoscience (operational)
- Three year funding cycle

Geoscience BC

- \$25 Million in new funding
- Independent NGO

Targeted Geoscience Initiative

- Federal – Provincial program
- \$25 million over 5 years / Canada

Why Explore British Columbia?

- Rich resource potential + variety of target types
- ACCESS to an excellent body of geoscience data
- Reliable & skilled labour force
- Established infrastructure & good access for international trade
- Positive trends in taxation & regulation
- A good environmental record
- Vancouver & BC - centre excellence in mining, exploration & finance
- Government supports Resource Developments



Thank You !

**Brian Grant, PGeo
PDAC March 2005**



PDAC Booth 732

EXPLORE BRITISH COLUMBIA