

GOVERNMENT

Yukon Geological Survey

Grant Abbott and staff
Yukon Geological Survey

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Grant Abbott¹ and staff

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OVERVIEW

The Yukon Geological Survey (YGS; Fig. 1) took a significant step forward in its evolution and development when, in September of this year, it became a Directorate within the Oil, Gas and Minerals Division of the Department of Energy, Mines and Resources. YGS is no longer part of the Mineral Resources Division and now has an expanded mandate to provide information to support exploration, development and management of not only mineral resources, but also oil and gas and to a lesser extent, other resources such as forests. YGS is currently being reorganized to effectively meet its new responsibility for both a higher level of management and a wider mandate. YGS is now divided into Technical Services, Mineral Services, Regional Geology, and Mineral and Hydrocarbon Assessments (Fig. 2). As an interim step, Don Murphy has been appointed acting manager of Regional Geology and Craig Hart has been appointed acting manager of Technical and Mineral



Figure 1. Yukon Geological Survey staff from left to right: Julie Hunt, Amy Tizzard (student), Mike Burke, Steve Israel, Olwyn Bruce, Steve Traynor, Lee Pigage, Erin Trochim (student), Charlie Roots, Don Murphy, Lara Lewis, Craig Hart, Geoff Bradshaw, Leyla Weston, Jeff Bond, Rod Hill, Maurice Colpron, Kelly Coventry, Diane Emond, Panya Lipovsky, Ali Wagner, Grant Lowey, Robert Deklerk, Amy Stuart, John Mair, Bill LeBarge, Grant Abbott, Karen Pelletier.

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Services. Other functions report to Grant Abbott, who has been appointed acting director. Rod Hill remains as operations manager.

The past year also saw a number of staff changes. We are pleased to welcome Tammy Allen and Tiffany Fraser to YGS. They are filling two petroleum assessment geologist positions provided by the Oil and Gas Branch. Ken Galambos is on a temporary assignment with the Department of Economic Development until March 31, 2006. Steve Traynor is taking his place as Yukon Mining Incentives Program (YMIP) coordinator. Jo-Anne van Randen is filling in for Steve as economic geologist. Amy Stuart is back with us on a short-term assignment as GIS technician. Monique Raitchey is on temporary assignment with another department until the fall of 2006. She is being ably replaced as office manager by Kelly Coventry. We were also fortunate to have John Mair with us for part of the year on a post doctoral fellowship from the Mineral Deposit Research unit at the University of British Columbia. Congratulations to Craig Hart for completing his PhD thesis at the University of

Western Australia in Perth, and for winning both the Julian Boldy Award for one of the three best economic geology presentations at the annual meeting of the Geological Association of Canada, and a service award for his years of work as editor of GEOLOG, the Association newsletter. Julie Hunt is also to be congratulated for completing her PhD thesis at James Cook University in Townsville, Australia.

YGS continued to enjoy stable core funding, but a department-wide shortfall in salary dollars forced the elimination of one vacant GIS technician position. We hope to reallocate resources to fill this position in the New Year. We did suffer from a shortfall in short-term funding with the winding down of the DIAND (Indian and Northern Affairs Canada) Knowledge and Innovation Fund and NRCan Targeted Geoscience Initiative, but more than made up for it with funding for geophysical surveys from the new DIAND Northern Economic Development program. Although the renewed TGI-3 was not available to Yukon, and the NRCan Cooperative Geological Mapping Strategy was not funded by the

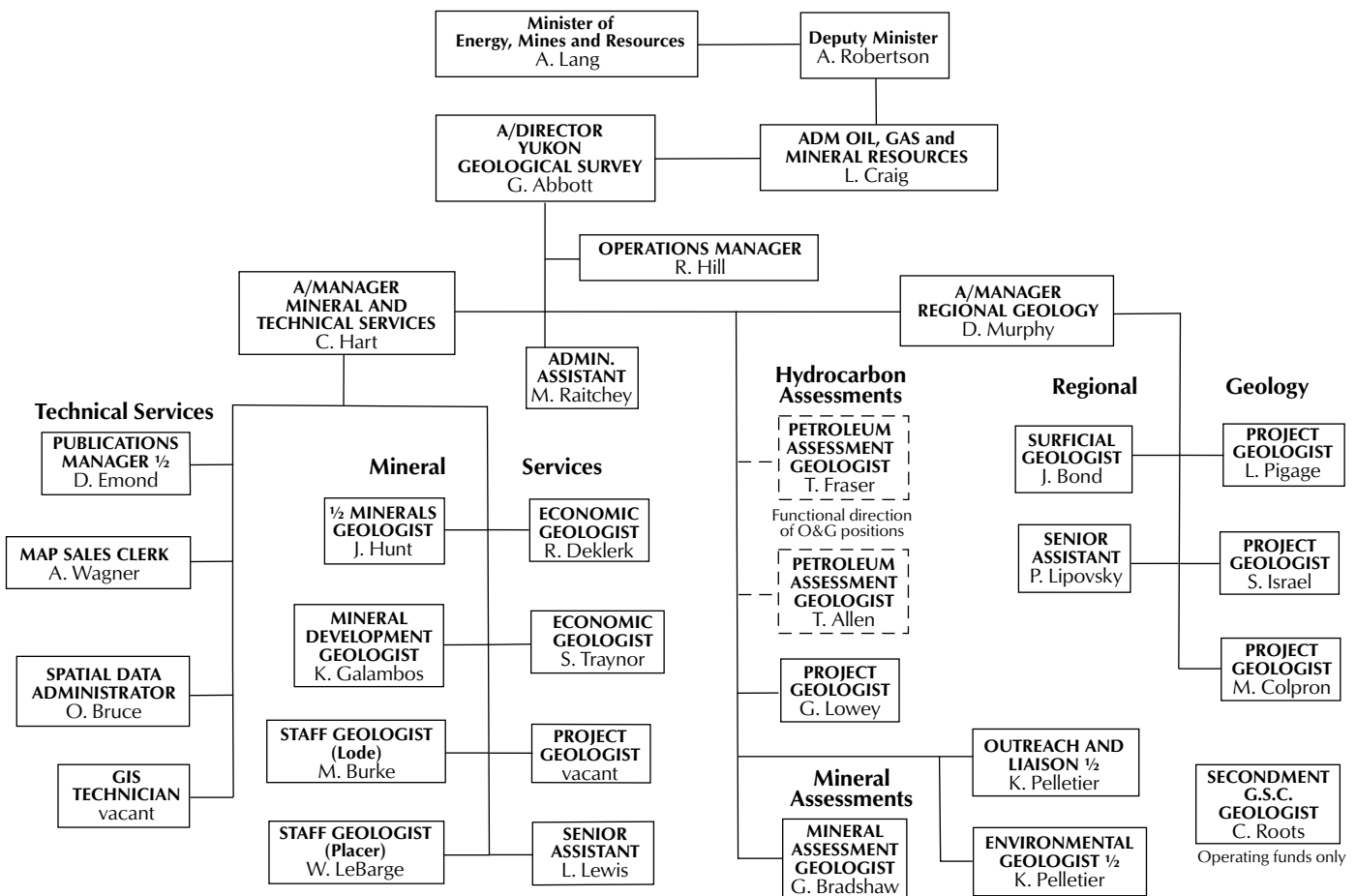


Figure 2. Yukon Geological Survey organization chart.

support hydrocarbon development and to meet increased demands for baseline data to address environmental and development issues while continuing to support our primary client, the mineral industry. Projects included 1:50 000-scale bedrock mapping, mineral deposit studies, surficial studies and mapping, regional stream sediment geochemistry, and topical geology studies. In addition, several office-based projects were undertaken to advance the Yukon Geoscience database.

BEDROCK MAPPING

1. Lee Pigage continued work in southeast Yukon near Toobally Lakes, where studies last year revealed significant new information on lower Paleozoic structure and stratigraphy, with implications for our understanding of the mineral potential of southeast Selwyn Basin.
2. Don Murphy continued work in Watson Lake map area, outlining the belts of volcanic rocks in Yukon-Tanana Terrane that host volcanogenic massive sulphide (VMS) deposits in the Finlayson Lake district, and determining both the internal structure of the terrane and its relationships to Slide Mountain Terrane and the rocks of the North American continental margin.
3. Maurice Colpron mapped in the Livingstone Creek area, where a lode source for gold placers in the area has yet to be found. This work builds on previous studies of Yukon-Tanana Terrane farther north and will help to set the stage for a future mapping program immediately to the west in the northern Whitehorse Trough.
4. Steve Israel continued mapping in the Kluane Ranges to better define the setting of magmatic copper-nickel-platinum group element deposits like Wellgreen. This project is also investigating the possibility that Windy Craggy stratigraphy occurs in the project area by focusing on the relationship between Alexander and Wrangellia and the Triassic volcanic successions found within both terranes. A secondary study of neotectonics within and surrounding the Alaska Highway corridor is also underway in partnership with the US Geological Survey.

MINERAL DEPOSIT STUDIES

1. Craig Hart and Lara Lewis continued to gather data on tungsten and beryl properties for future compilations. Fieldwork in the Hyland River area concentrated on the numerous gold properties in this undermapped area that appear to be structurally controlled rather than intrusion-related.
2. Jim Mortensen (UBC) and Bill LeBarge are studying trace element characteristics of placer gold in the Klondike to identify distinct populations and potential lode sources.
3. John Mair (MDRU/YGS), a post-doctoral fellow from Australia, is developing a database of the lithological, geochemical and isotopic characteristics of Cretaceous igneous rocks in the Yukon to help to differentiate mineralized plutons from unmineralized ones.
4. Julie Hunt continued her studies of iron oxide-copper-gold occurrences associated with the Wernecke Breccias. This work is expanding on earlier research that identified lithological, structural and fluid compositional influences on mineralization in the Wernecke Mountains with a focus on uranium.
5. Jake Hanley (U. of Toronto) with partial support from YGS is beginning a post-doctoral study at the University of Toronto on the evolution and generation of magmatic fluids and their relationship to gold mineralization.

WHITEHORSE TROUGH OIL AND GAS POTENTIAL PROJECT

1. Grant Lowey continued studies of the sedimentology and stratigraphy of the Laberge Group and Tantalus Formation.
2. Darrel Long (Laurentian U.) continued studies of the Lewes River Group and Tantalus Formation.
3. Steve Piercey (Laurentian U.) is studying the chemistry and origin of volcanic assemblages in the Whitehorse Trough.
4. Amy Tizzard (U. of Victoria) is nearing completion of her M.Sc. thesis on the tectonic evolution of the western margin of Stikinia.
5. The Geological Survey of Canada/Yukon Geological Survey seismic survey across northern Whitehorse Trough is now processed and results will be published in various publications over the next year.

SURFICIAL STUDIES

1. Bill LeBarge visited active placer mining operations throughout the Yukon to sample pay gravel and heavy minerals, complete stratigraphic descriptions, and update the placer database. Ongoing studies by Bill, coordinated with Mark Nowosad of Client Services and Inspections, will further define the relationship between water quality and placer sediment on the Klondike, Indian, McQuesten, and Sixty Mile rivers and put the information into a geological context.
2. Erin Trochim and Panya Lipovsky, in partnership with the GSC, began compilation of Yukon Department of Highways borehole data from the Alaska Highway corridor as part of a national permafrost database compilation. This data will assist with development of predictive models for permafrost distribution and allow testing of geophysical techniques for detecting permafrost.
3. Jeff Bond began a study of element distribution patterns in soil profiles on the Lone Star, Clip and Lucky Joe properties. This project will aid understanding of how to interpret soil geochemical data obtained from the unglaciated terrain of west-central Yukon.
4. Brent Ward (Simon Fraser U.) in collaboration with Jeff Bond and John Gosse (Dalhousie University) sampled boulders for cosmogenic dating in the Aishihik Lake area in an attempt to determine the age of the Reid Glaciation. This information is essential to developing a clear understanding of placer deposit evolution in west-central Yukon. This study also addresses broader questions pertaining to northwestern North America's climate history.
5. Jeff Bond began a glacial history reconstruction project for the Big Salmon Range in order to describe the ice-flow history for the McConnell glaciation. This will better enable mineral exploration companies to trace float and soil anomalies to their sources, and also provide insights into placer potential for the Big Salmon Range.
6. Panya Lipovsky monitored an active permafrost thaw-related landslide near Carmacks. She also monitored turbidity levels in the sediment-laden creek issuing from the landslide, which drains into an important salmon spawning ground.
7. Panya Lipovsky collaborated with Antoni Lewkowicz (U. of Ottawa) on studies documenting the effect of extensive recent forest fires on slope stability in areas underlain by permafrost. Large numbers of active-layer detachment slides have already increased sedimentation into drainages surrounding Dawson and could impact efforts to monitor the effects of placer mining on water quality. Dr. Lewkowicz is also studying the origin and dynamics of thermokarst lakes and palsen in the Wolf Creek watershed and developing new permafrost mapping techniques in southwest Yukon.
8. Panya Lipovsky recently completed a 1:50 000-scale surficial map at Watson Lake as a contribution to a Department of Environment (Government of Yukon) project to develop standards for a biophysical mapping framework for southeast Yukon. Biophysical mapping is an important planning tool that integrates physical and biological parameters to allow systematic classification of land for forest management and other activities.

TOPICAL STUDIES

1. Dejan Milidragovic under the direction of Dr. Derek Thorkelson (Simon Fraser U.) began a petrologic study of lamprophyre dykes in the Wernecke Mountains.
2. Luke Beranek (UBC) under the direction of Dr. Jim Mortensen began a doctoral study of Triassic sedimentary overlap assemblages in central Yukon to better understand the timing and nature of terrane accretion in the Canadian Cordillera.

REGIONAL STREAM GEOCHEMISTRY

1. GSC, in collaboration with Geoff Bradshaw, completed a survey in north Yukon, west of Fishing Branch Territorial Park, to assist with development of the North Yukon Regional Land Use Plan
2. GSC in collaboration with Geoff Bradshaw completed a survey of the Flat River map area, south of the Cantung mine. This area has known high potential for tungsten and gold.

The results of both surveys will be released in early summer of 2006.

REGIONAL AEROMAGNETIC SURVEYS

Funding was awarded by DIAND under the Strategic Investments for Northern Economic Development Program (SINED) for Aeromagnetic surveys in the Wernecke/Mackenzie Mountains (1) and Eagle Plains area (2). The surveys are expected to be flown early in 2006.

MINERAL/OIL AND GAS ASSESSMENTS

Geoff Bradshaw and Lee Pigage are participating in regional land use planning for (1) North Yukon and (2) the Peel River watershed to address mineral and oil and gas potential, respectively. Geoff carried out regional mineral assessments that included field work in both areas to better understand mineral potential. Lee helped to interpret existing oil and gas assessments. The North Yukon Planning Commission is aiming for a draft plan by summer of 2006, whereas the Peel Planning Commission is in the early stage of collecting baseline data.

PROGRAMS

MINING AND PETROLEUM ENVIRONMENT RESEARCH GROUP (MPERG)*

In early 2005, the group expanded its mandate beyond mining to include environmental research in support of the petroleum industry and changed its name to reflect this partnership. Administration of the Mining and Petroleum Environmental Research Group (MPERG) is done by Karen Pelletier. Six studies were approved for funding for 2005/06. A Post-Fire Evaluation of the Bioengineering Trials at Noname Creek, previously funded by MPERG, was undertaken by Laberge Environmental Services. Following extensive local forest fires in 2004, increased surface runoff was anticipated on the permafrost slope which characterizes the area, providing opportunity to continue field monitoring of the erosion and to optimize the bioengineering applications already in place. Laberge Environmental Services also began a new bioengineering study on Gold Run Creek in the Klondike area. This study will examine bioengineering techniques that aim to mitigate large-magnitude disturbances in permafrost areas that are easily accessed by local miners, and prove that reclamation and erosion control can be accomplished using low-maintenance technology at relatively little expense. The Klondike Placer Miners' Association received

funding to develop a protocol for the identification of physical constraints of settling ponds in order to assist placer miners and regulators operating under the new placer regime. T. Lewkowicz from the University of Ottawa initiated a multi-faceted study on Permafrost distribution and dynamics in the Yukon, undertaken by a group of M.Sc. students. The study includes four projects that relate to the response of the permafrost landscape to climate change. These have applications in enhancing knowledge on the distribution of permafrost in the Yukon. This will be relevant to linear infrastructure development, such as the proposed Alaska Highway Gas Pipeline. A. Clark and T. Hutchinson of Trent University completed a three-year M.Sc. study, previously funded by MPERG, on Enhancing Natural Succession on Yukon Mine Tailings Sites and were awarded further funding to continue and expand the project. The study was initiated in 2003 at the Mount Skukum, United Keno Hill, and Wellgreen mine sites, with the overall objective to examine site-specific successional trajectories and to direct the succession pathways to obtain long-term, low-input solutions. Ducks Unlimited Canada received funding to study waterfowl moulting and fall staging in the Turner Lakes complex on the Peel Plateau. The objective is to gather information about the use of the Turner Lakes wetlands by moulting and staging water birds in the summer and fall. The information gathered will provide some environmental information for mitigating oil and gas activities during key water bird seasons, and will provide ecological values for developing a long-term management plan for the wetlands, as part of the Peel River watershed land-use planning.

YUKON MINING INCENTIVES PROGRAM (YMIP)

The Yukon Mining Incentives Program is currently administered by Steve Traynor. This year, funding was offered to 63 of 75 applications for a total of \$1,009,000. Twelve of the successful applications were in the Grassroots-Prospecting, 12 in the Focused Regional and 39 in the Target Evaluation modules. Eighty-four percent of these applicants were Yukon-based individuals or companies.

The continuing trend of increasing gold prices, combined with copper prices that have doubled in the past two years, has resulted in high levels of exploration targeting these two commodities. This trend mirrored the focus of 39 of the 54 exploration projects which preceded this year and included 10 applicants who explored for alluvial gold. Six projects explored for lead-zinc, three for molybdenum, three for silver and three for uranium and other commodities.

*Previously, Mining Environment Research Group (MERC)

LIAISON TO INDUSTRY, FIRST NATIONS AND THE PUBLIC

YGS recognizes the importance of effectively communicating information on the geology and mineral and energy resources of the Yukon to a broad audience that includes industry, resource managers, First Nations and the general public. We are continuing to focus more attention on developing strategies and products that meet these needs.

Mike Burke and Bill LeBarge, our main links to the exploration industry, continued to monitor Yukon hard-rock and placer mining and mineral exploration activity, visit active properties, review reports for assessment credit, and maintain the assessment report library.

Karen Pelletier, Charlie Roots and other YGS staff continue to make presentations in the schools and conduct field trips in the communities. New products developed this year to increase public awareness of the geology and mineral resources of the Yukon include an interpretive guide to the Whitehorse Copper Belt by Danièle Héon; a geological map and interpretive display of Tombstone Park by Charlie Roots; and a geological map of southwest Yukon with emphasis on the Kluane Ranges and Kluane Park in partnership with the Geological Survey of Canada.

Karen Pelletier continues to review Mining Land Use and Water License applications, and monitor reclaimed sites to document the effectiveness of mitigation practices. Karen also represents YGS on several committees which sponsor environmental research that involves geology. Karen has also been involved in developing a best practices guide for reclamation of placer mines.

INFORMATION MANAGEMENT AND DISTRIBUTION

With the increasing volume of information generated by YGS and others, and rapidly evolving digital technology, the Survey has placed considerable effort into making geological information more accessible. A large part of our effort has gone into developing and maintaining key databases and making all of our information internet-accessible. The extent of coverage of bedrock and surficial maps, regional geochemistry and geophysics are summarized in Figure 4. Ongoing activities include support for the H.S. Bostock Core Library (Range Road) and the Energy, Mines and Resources (EMR) library (Elijah Smith Building).

DATABASES

With new reporting requirements to securities regulators, widely recognized mineral deposit models are becoming increasingly important. In cooperation with the British Columbia Geological Survey, Anna Fonseca and Geoff Bradshaw have adapted the British Columbia Geological Survey Mineral Deposit profiles to the Yukon. These models are now incorporated into Yukon MINFILE and published separately as Open File 2005-5.

Yukon MINFILE, the Yukon's mineral occurrence database, is maintained by Robert Deklerk and Steve Traynor. An update was released in November, 2005. The database now contains 2612 records, of which more than 500 have been revised, and is complete to the end of 2004. All mineral occurrences are now assigned to a deposit model. Reserve tables have been completely revised and updated to match, as closely as possible, the Canadian Institute of Mining Standards for Reporting Mineral Resources and Reserves. All known assessment reports are now cited for each occurrence. In the past, some reports were not listed in an occurrence's reference field due to confidentiality rules in effect at that time.

The Yukon Placer Database, compiled under the direction of Bill LeBarge, was updated in May of 2005. The database is in Microsoft Access 2000 format and is a comprehensive record of the geology and history of Yukon placer mining. The database contains descriptions of 456 streams and rivers, and 1430 associated placer occurrences, of which 238 were updated for this version. It also includes location maps in Portable Document Format (PDF). A new release is planned for spring 2006 which will include detailed updated information from placer mining activity between 2003 and 2005.

The Yukon GEOPROCESS File, under the direction of Diane Emond, is an inventory of information on geological processes and terrain hazards. It includes 1:250 000-scale maps showing permafrost, landslides, recent volcanic rocks, structural geology, and seismic events, and also includes references and summaries of bedrock and surficial geology. The GEOPROCESS File is intended as a planning aid for development activities and is available for most areas south of 66° latitude. The maps are now standardized in colour, and available on a single compact disk. Maps with text are in AutoCAD 2000 and PDF formats.

The Yukon Digital Geology compilation was updated in 2003 by Steve Gordey and Andrew Makepeace of the Geological Survey of Canada, with funding from YGS. It

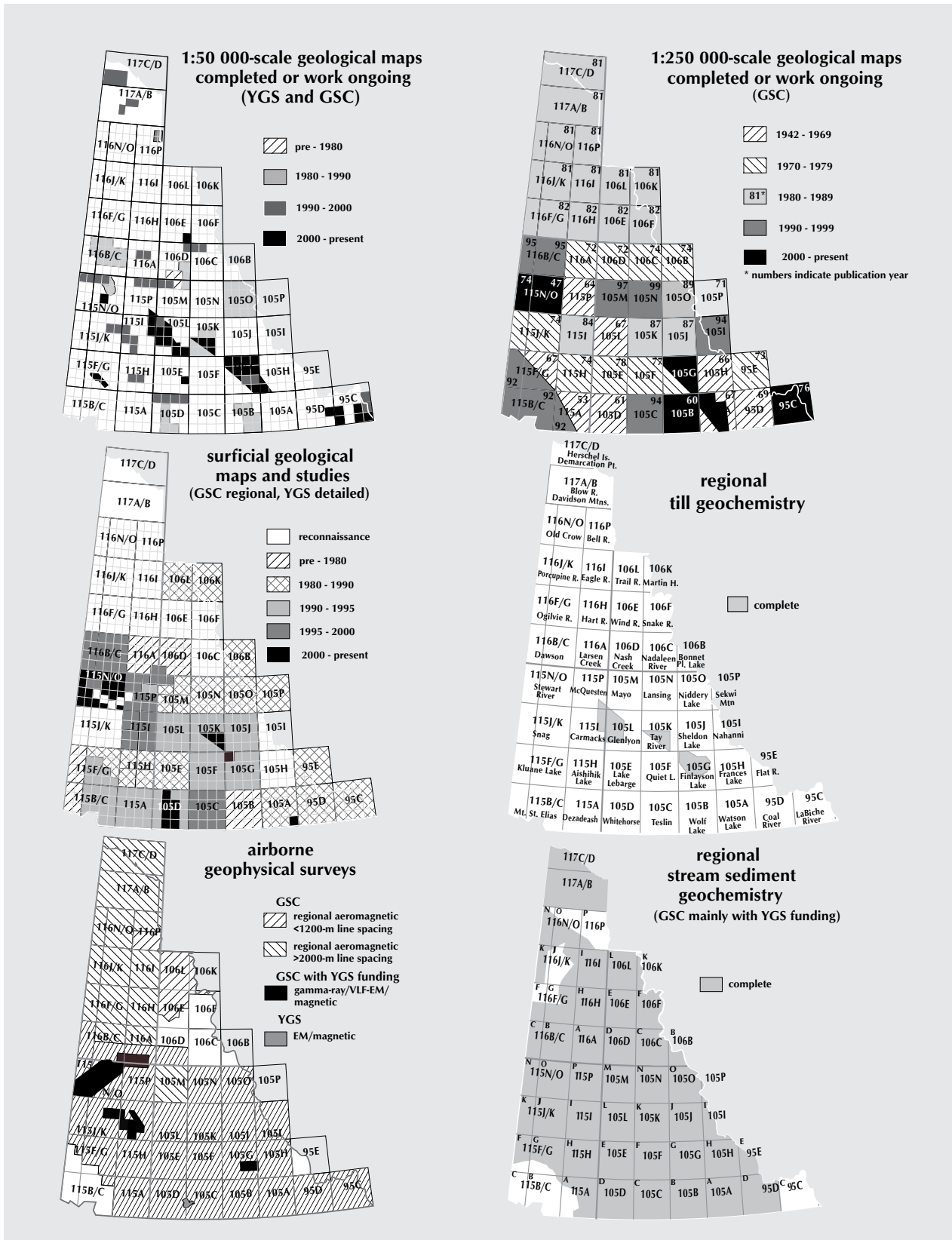


Figure 4. Summary of available geological maps, and regional geochemical and geophysical surveys in the Yukon.

includes syntheses of bedrock geology and glacial limits, compilations of geochronology, paleontology and mineral occurrences, and a compendium of aeromagnetic images, as well as an oil and gas well database. All are now available on CD-ROM. Bedrock geology and glacial limit paper maps are also available at 1:1 000 000 scale.

The Yukon Regional Geochemical Database 2003, compiled by Danièle Héon, contains all of the available digital data for regional stream sediment surveys that have been gathered in the Yukon under the Geological Survey of Canada's National Geochemical Reconnaissance Program. It is available on CD-ROM in Microsoft Excel 2000 format and in ESRI ArcView Shapefile format. The database has been enhanced this year through a contract with Georeference Online. Multi-element anomaly clusters were generated using Minematch software and matched with mineral deposit models. This exercise was essentially the same as one undertaken on the British Columbia stream geochemical database through the Rocks to Riches Program. Results are now available online through the YGS Map Gallery.

The YukonAge Database, compiled by Katrin Breitsprecher and Jim Mortensen at the University of British Columbia with funding from YGS, was updated in 2004. It can be viewed online at the YGS Map Gallery in a version modified by Mike Villeneuve and Linda Richard of the Geological Survey of Canada. The database now contains 1556 age determinations derived from 1166 rock samples from the Yukon Territory. It is available in both Microsoft Access 2000 format and as a flat file in Microsoft Excel 2000 format so that the data may be viewed without Microsoft Access.

The Yukon Geoscience Publications Database, originally compiled by Lara Lewis and Diane Emond, is current to 2005 and contains more than 5000 references to papers on Yukon geology and mineral deposits, including YGS publications. A completely up-to-date searchable version is now available on our website.

This year, YGS is continuing to digitize the backlog of assessment reports. By February 2006, the entire collection of more than 5000 reports will be in PDF format and accessible over the internet. In addition, we have acquired exploration records from the various companies that owned the Faro District. This acquisition includes both records of the Faro District, as well as outside projects. Most of the records are now available for viewing.

H. S. BOSTOCK CORE LIBRARY

Mike Burke and Ken Galambos maintain the H.S. Bostock Core Library. The facility contains about 128 000 m of diamond drill core from about 200 Yukon mineral occurrences. Confidentiality of material is determined on the same basis as mineral assessment reports. Confidential core can be viewed with a letter of release from the owner. Rock saws and other rock preparation equipment are available to the public.

EMR LIBRARY

The EMR library in the Elijah Smith Building is an invaluable resource that is available to the public, but often overlooked. It is Yukon's largest scientific library and includes collections that, prior to devolution, belonged to Indian and Northern Affairs Canada and the Department of Energy, Mines and Resources, Yukon Government. The library houses Yukon assessment reports, maps (including geological, topographical and aeromagnetic), and aerial photographs. It contains most geological journals and a good selection of references on general geology, Yukon geology and economic geology. The library is also the point of contact for access to Faro exploration records, which were recently acquired by YGS. In addition to geological information, the library also has books, reports and journals for the following subjects: oil and gas, forestry, agriculture and energy.

INFORMATION DISTRIBUTION

YGS distributes information in three formats: 1) paper maps and reports are sold and distributed through our Geoscience Information and Sales Office; 2) many recent publications and databases are available in digital format at much lower prices than for paper copies; and 3) most of our publications are available as PDF files on our website (www.geology.gov.yk.ca), free of charge. A catalogue of assessment reports is also available online (<http://www.emr.gov.yk.ca/library>).

We are pleased to make spatial data available through the Map Gallery interactive map server, which can be accessed through the YGS website. We are continuing to improve the Map Gallery. Users are encouraged to provide feedback and suggest improvements.

Hard copies of YGS publications are available at the following address:

Geoscience Information and Sales
c/o Whitehorse Mining Recorder
102-300 Main Street (Elijah Smith Building)
P.O. Box 2703 (K102)
Whitehorse, Yukon Y1A 2C6

Ph. (867) 667-5200
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To access publications and to learn more about the Yukon Geological Survey visit our website at: <http://www.geology.gov.yk.ca> or contact us directly:

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To access the EMR Library:
Website: www.emr.gov.yk.ca/library
Ph.: (867) 667-3111
E-mail: emrlibrary@gov.yk.ca

or drop into Room 335-300 Main Street,
Elijah Smith Building, Whitehorse.

2005 PUBLICATIONS AND MAPS

YGS OPEN FILES

- Abbott, J.G. (ed.), 2005. Yukon Geoscience Needs: Results of the third Yukon Geoscience Planning Workshop. Yukon Geological Survey, Open File 2005-4, 55 p.
- Colpron, M., 2005. Geological map of Livingstone Creek area (NTS 105E/8), Yukon (1:50 000 scale). Yukon Geological Survey, Open File 2005-9.
- Fonseca, A. and Bradshaw, G., 2005. Yukon Mineral Deposit Profiles. Yukon Geological Survey, Open File 2005-5.
- Israel, S., Tizzard, A. and Major, J., 2005. Geological map of the Duke River area (parts of NTS 115G/2,3,5,6,7), Yukon (1:50 000 scale). Yukon Geological Survey, Open File 2005-11.
- Kennedy, K., 2005. Surficial Geology of Seagull Creek (Parts of NTS 105F/10 and 7), Yukon. Yukon Geological Survey, Open File 2005-1, 1:50 000 scale.
- Lipovsky, P.S. and McKenna, K., 2005. Local Scale Biophysical Mapping for Integrated Resource Management, Watson Lake (NTS 105A/2), Yukon. Yukon Geological Survey, Open File 2005-6 (includes report, 2 maps (Open Files 2005-7 and 8) and CD-ROM with digital files (Open File 2005-6(D))).
- Lipovsky, P.S., McKenna, K. and Huscroft, C.A., 2005. Surficial geology of Watson Lake (NTS 105A/2), Yukon (1:50 000 scale). Yukon Geological Survey, Open File 2005-7.
- McKenna, K., Lipovsky, P.S. and Huscroft, C.A., 2005. Preliminary biophysical map of Watson Lake area (NTS 105A/2), Yukon (1:50 000 scale). Yukon Geological Survey, Open File 2005-8.
- Mortensen, J.K. and Murphy, D.C. (compilers), 2005. Bedrock geological map of part of Watson Lake area (all or part of NTS 105A/2,3,5,6,7,10,11,12,13,14), southeastern Yukon (1:150 000 scale). Yukon Geological Survey, Open File 2005-10.
- Osadetz, K.G., Chen Z. and Bird T.D., 2005. Petroleum Resource Assessment, Eagle Plain Basin and Environs, Yukon Territory, Canada. Yukon Geological Survey, Open File 2005-2; Geological Survey of Canada, Open File 4922, 88 p.

Osadetz, K.G., MacLean B.C., Morrow D.W., Dixon J. and Hannigan P.K., 2005. Petroleum Resource Assessment, Peel Plateau and Plain, Yukon Territory, Canada. Yukon Geological Survey, Open File 2005-3; Geological Survey of Canada, Open File 4841, 76 p.

YGS GEOSCIENCE MAPS

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Bond, J., Morison, S. and McKenna, K., 2005. Surficial Geology of Fenwick Creek (NTS 105D/3), Yukon (1:50 000 scale). Yukon Geological Survey, Geoscience Map 2005-3.

Bond, J., Morison, S. and McKenna, K., 2005. Surficial Geology of Alligator Lake (NTS 105D/6), Yukon (1:50 000 scale). Yukon Geological Survey, Geoscience Map 2005-4.

Bond, J., Morison, S. and McKenna, K., 2005. Surficial Geology of Robinson (NTS 105D/7), Yukon (1:50 000 scale). Yukon Geological Survey, Geoscience Map 2005-5.

Bond, J., Morison, S. and McKenna, K., 2005. Surficial Geology of MacRae (NTS 105D/10), Yukon (1:50 000 scale). Yukon Geological Survey, Geoscience Map 2005-6.

Bond, J., Morison, S. and McKenna, K., 2005. Surficial Geology of Whitehorse (NTS 105D/11), Yukon (1:50 000 scale). Yukon Geological Survey, Geoscience Map 2005-7.

Bond, J., Morison, S. and McKenna, K., 2005. Surficial Geology of Upper Laberge (NTS 105D/14), Yukon (1:50 000 scale). Yukon Geological Survey, Geoscience Map 2005-8.

Devine, F., Murphy, D.C., Carr, S.D., Kennedy, R. and Tizzard, A., 2005. Geological Map of the southern Campbell Range (NTS 105H/3 SW), southeastern Yukon (1:20 000 scale). Yukon Geological Survey, Geoscience Map 2005-1.

YGS DATABASES

Deklerk, R. and Traynor, S. (compilers), 2005. Yukon MINFILE 2005 – A database of mineral occurrences. Yukon Geological Survey, CD-ROM.

LeBarge, W.P. and Coates J. (compilers), 2005. Yukon Placer Database 2005 – Geology and mining activity of placer occurrences. Yukon Geological Survey, CD-ROM.

ANNUAL REPORTS

Traynor, S. (compiler), 2005. Yukon Mineral Deposits 2005. Yukon Geological Survey, 16 p.

Traynor, S. (compiler), 2005. Yukon Mineral Property Update 2004. Yukon Geological Survey, 81 p.

YGS CONTRIBUTIONS TO OUTSIDE PUBLICATIONS

Colpron, M., Gladwin, K., Johnston, S.T., Mortensen, J.K. and Gehrels, G.E., 2005. Geology and juxtaposition history of Yukon-Tanana, Slide Mountain and Cassiar terranes in the Glenlyon area of central Yukon. *Canadian Journal of Earth Sciences*, vol. 42, p. 1431-1448.

Goldfarb, R.J., Baker, T., Dubé, B., Groves, D.I., **Hart, C.J.R.** and Gosselin, P., 2005. Distribution, Character, and Genesis of Gold Deposits in Metamorphic Terranes. *Economic Geology 100th Anniversary Volume*, J.W. Hedenquist, J.F.H. Thompson, R.J. Goldfarb and J.P. Richards (eds.).

Groat, L.A., **Hart, C.J.R.**, **Lewis, L.L.** and Neufeld, H., 2005. Emerald and Aquamarine Mineralization in Canada, *Geoscience Canada*, vol. 32, no. 2, p. 17-28.

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La Commission géologique du Yukon

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Le Service de géologie du Yukon

Abbott, J.G. et Colpron, M., 2006. La Commission géologique du Yukon. *Dans : Yukon Exploration and Geology 2005*, D.S. Emond, G.D. Bradshaw, L.L. Lewis et L.H. Weston (réds.), la Commission géologique du Yukon, p. 67-70.

APERÇU

La commission géologique du Yukon (CGY; Figure 1, p. 51) a fait de grands progrès dans son évolution, lorsqu'en septembre de cette année elle est devenue une Direction au sein de la Division du pétrole, du gaz et des minéraux du ministère de l'Énergie, des Mines et des Ressources (MEMR). La CGY ne fait plus partie de la Division des ressources minérales. Son mandat est maintenant augmenté; elle fournit dorénavant de l'information en support des activités d'exploration, de développement et de gérance, non seulement des ressources minérales, mais aussi des ressources pétrolières et gazières, et de façons plus limitées, d'autres ressources telle que les forêts. La CGY est présentement en cours de réorganisation de façon à mieux répondre à son mandat élargi et à ses plus grandes responsabilités administratives. La CGY est maintenant sous-divisée entre quatre Services : soit les Services techniques, les Services minéraux, la Géologie régionale, et les Services d'évaluation du potentiel minéral et en hydrocarbures (Figure 2, p. 52). Durant cette période de transition, Don Murphy assumera le poste de gérant de la Géologie régionale, et Craig Hart celui de gérant des Services techniques et minéraux. Les autres Services se rapportent directement à Grant Abbott, qui fût nommé directeur intérimaire de la Commission géologique. Rod Hill demeure en charge de la gérance des opérations.

L'année passée fût aussi marquée par de nombreux changements au sein du personnel. La CGY est heureuse d'accueillir Tammy Allen et Tiffany Fraser à titre de géologue d'évaluation du potentiel pétrolier, deux positions contribuées par la Direction du pétrole et du gaz du MEMR. Ken Galambos est temporairement à l'emploi du ministère du Développement économique, jusqu'au 31 mars 2006. Steve Traynor le remplace à titre de coordonnateur du Programme d'encouragement des activités minières du Yukon, alors que Jo-Anne van Randen remplace Steve à titre de géologue économique. Amy Stuart est de retour parmi nous pour un contrat à court terme en tant que technicienne en système d'information géographique, et Monique Raitchey est temporairement à l'emploi d'un autre ministère jusqu'à l'automne 2006; elle est remplacée de façon experte par Kelly Coventry. John Mair, un associé post-doctoral de l'unité de recherche en gîtes minéraux de l'Université de Colombie-Britannique, fût aussi parmi nous pour une partie de l'année. Félicitations à Craig Hart pour avoir complété sa thèse de doctorat à l'Université d'Australie-occidentale de Perth et pour avoir reçu deux prix de l'Association géologique du Canada: le prix Julian Boldy pour une des trois meilleures présentations en géologie économique à la réunion annuelle de l'Association, et un autre prix pour ses années de services en tant qu'éditeur de GEOLOG, le périodique d'information de l'Association. Julie Hunt a elle aussi complétée sa thèse de doctorat à l'Université James Cook en Australie; nous la félicitons!

La CGY continue de recevoir un financement de base stable, quoiqu'un déficit de financement au niveau des salaires à l'échelle du ministère nous a forcé à éliminer une position vacante de

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technicien en système d'information géographique. On espère pouvoir redistribuer nos ressources au cours de l'année à venir, afin de rétablir cette position. Nous avons aussi souffert une perte de financement à court terme avec la disparition des Fonds pour le savoir et l'innovation du ministère des Affaires indiennes et du Nord canadien (MAINC) et de l'initiative géoscientifique ciblée du ministère canadien des Ressources naturelles (RNCAN); financement qui fût amplement remplacé par les relevés géophysiques subventionnés par le nouveau programme de développement économique du Nord du MAINC. Bien que la troisième phase du programme d'initiative géoscientifique ciblée de RNCAN n'était pas offerte au Yukon, et que la stratégie de cartographie géologique coopérative de RNCAN n'a pas reçu de financement du gouvernement fédéral, on demeure toutefois optimistes que des nouveaux fonds seront disponibles soit par l'entremise du programme de développement économique du Nord du MAINC ou dans le cadre de la stratégie du Nord du gouvernement du Yukon et du MAINC.

Un comité de liaison technique à la CGY examine nos programmes deux fois par année. Nous remercions le président, Gerry Carlson, et les membres du comité pour leur précieux appui et les conseils constructifs qu'ils nous fournissent. Cette année, Moira Smith et Bernie Kreft ont quittés le comité; ils sont remplacés par Rob Carne et Shawn Ryan, qui sont deux des explorateurs les plus expérimentés au Yukon. Nous attendons avec plaisir leurs conseils experts. Les autres membres du comité sont Al Doherty, Jean Pautler, Forest Pearson, Jim Mortensen, Jim Christie et Greg Lynch.

TRAVAUX SUR LE TERRAIN

La CGY a connue cette année une autre campagne de travaux sur le terrain couronnée de succès avec 24 projets en cours, énumérés ci-dessous et indiqués en Figure 3. Nos travaux furent diversifiés de façon à mieux répondre à notre nouveau mandat de soutien à la mise en valeur des hydrocarbures et à la demande accrue pour les données de base à l'appui de la réglementation dans le domaine de l'environnement et de la gestion des terres, tout en continuant nos projets en support de l'industrie minière. Nos travaux cette année incluent quatre projets de cartographie géologique du substratum rocheux au 1 : 50 000, des études de gisements minéraux, des études et travaux de cartographie des formations superficielles, la géochimie régionale des cours d'eau et des études

géologiques détaillées. De plus, de nombreux projets de bureau avaient pour but l'amélioration de la base de données géoscientifiques du Yukon.

CARTOGRAPHIE DU SUBSTRATUM ROCHEUX

Lee Pigage a poursuivi sa cartographie de la région des lacs Toobally dans le sud-est du Yukon, alors que Don Murphy a étendu sa cartographie des roches du terrane de Yukon-Tanana, les roches hôtes des gisements de sulfures massifs de la région du lac Finlayson, vers le sud dans région du lac Watson. Pour sa part, Maurice Colpron a complété la carte du ruisseau Livingstone, où la source de l'or placérien demeure un mystère. Dans le sud-ouest, Steve Israel poursuit la cartographie des monts Kluane dans le but de mieux définir le mode d'emplacement des gisement de cuivre, nickel, et des éléments du groupe du platine, tel que Wellgreen.

ÉTUDES DE GISEMENTS MINÉRAUX

Craig Hart et Lara Lewis ont poursuivi leurs travaux sur le tungstène et le béryl; une étude de terrain dans la région de la rivière Hyland fût concentrée sur une minéralisation en or dont le contrôle semble être structural plutôt qu'intrusif. Jim Mortensen de l'Université de Colombie-Britannique a étudié en collaboration avec Bill LeBarge (CGY) les caractéristiques des éléments traces des gîtes d'or placériens afin d'identifier des populations distinctes et d'éventuelles sources d'or filonien. John Mair a entamé le développement d'une base de données sur les caractères lithologiques, géochimiques, et isotopiques des roches ignées d'âge Crétacé du Yukon. Julie Hunt poursuit ses travaux sur la géologie et le potentiel minéral des brèches de Wernecke, avec cette fois un focus sur l'uranium. Et Jake Hanley de l'Université de Toronto, avec le support de la CGY, en entrepris une étude sur l'origine et l'évolution des fluides magmatiques, et leurs relations avec la minéralisation aurifère.

PROJET DU BASSIN DE WHITEHORSE

Grant Lowey a continué ses études sédimentologiques et stratigraphiques du Groupe de Laberge et de la Formation de Tantalus, alors que Darrell Long de l'Université Laurentienne a poursuivi ses études du Groupe de Lewes River et de la Formation de Tantalus. Steve Piercey, lui aussi de l'Université Laurentienne, étudie pour sa part la géochimie des roches volcaniques du bassin de Whitehorse. Amy Tizzard de l'Université de Victoria aura bientôt complété sa thèse de maîtrise portant sur l'évolution structurale de la marge occidentale du terrane

de Stikinia. La compilation des relevés sismiques à l'extrémité nord du bassin de Whitehorse, exécutés par la Commission géologique du Canada (CGC) en partenariat avec la CGY, est maintenant complétée; les résultats de cette étude seront publiés dans une série de rapports au cours de l'année à venir.

ÉTUDES DES FORMATIONS SUPERFICIELLES

Bill LeBarge a visité les opérations minières placériennes à travers le Yukon et a poursuivi ses études avec Mark Nowosad, des Services aux clients et d'inspection du MEMR, afin de mieux caractériser le contexte géologique et la relation entre la qualité des eaux et les effluents de sédiments des opérations de placers le long des rivières Klondike, Indian, McQuesten and Sixty Mile. Erin Troshim et Panya Lipovsky, en collaboration avec la CGC, ont entamées une compilation des informations de forages le long de la route de l'Alaska pour contribuer à la base de données nationale sur le pergélisol. Jeff Bond a débuté une étude sur la distribution des éléments dans le sol dans les terrains non-glaciaires du centre-ouest du Yukon, afin de développer une méthode d'interprétation des données géochimiques du sol dans ce type de terrain. Jeff a aussi étudié l'histoire glaciaire de la chaîne de Big Salmon. Brent Ward, de l'Université Simon Fraser, en collaboration avec Jeff Bond et John Gosse (Université de Dalhousie), a échantillonné des blocs dans la région du lac Aishihik pour de la datation cosmogénique afin d'établir l'âge de l'époque glaciaire de Reid. Panya Lipovsky a récemment complétée sa carte géologique des formations superficielles au 1 : 50 000 de la région de Watson Lake dans le cadre d'un projet de cartographie biophysique du sud-est du Yukon du ministère de l'Environnement du gouvernement du Yukon. Panya a aussi poursuivi la surveillance d'un glissement de terrain actif liés à la fonte du pergélisol près de Carmacks et a participé avec Antoni Lewkowicz de l'Université d'Ottawa à une étude des effets des récents feux de forêts sur la stabilité des terrains pergélisols. Docteur Lewkowicz étudie aussi l'origine et la dynamique des lacs thermokastiques et des palses dans le bassin du ruisseau Wolf, en plus de développer de nouvelles techniques pour la cartographie du pergélisol.

ÉTUDES DÉTAILLÉES

Dejan Milidragovic a débuté une étude pétrologique des dykes de lamprophyres des monts Wernecke sous la direction du Docteur Derek Thorkelson de l'Université Simon Fraser. Luke Beranek a pour sa part entamé une étude doctorale des roches sédimentaires triassiques du centre du Yukon sous la direction du Docteur Jim Mortensen de l'Université de Colombie-Britannique.

RELEVÉS GÉOCHIMIQUES

Des relevés géochimiques régionaux des cours d'eau furent complétés par la CGC en collaboration avec Geoff Bradshaw (CGY) à l'ouest du parc territorial de Fishing Branch dans le nord Yukon et dans la région de la rivière Flat, au sud de Cantung. Les résultats de ces relevés devrait être disponibles en début d'été 2006.

RELEVÉS GÉOPHYSIQUES

Deux relevés magnétiques aériens dans les monts Wernecke et Mackenzie et dans la région d'Eagle Plains sont financés par le MAINC dans le cadre de son programme d'investissements stratégiques dans le développement économique du Nord. L'acquisition des ces relevés est prévue pour le printemps 2006.

ÉVALUATIONS MINÉRALES ET EN HYDROCARBURES

Geoff Bradshaw et Lee Pigage sont tous deux impliqués dans les initiatives de planification de l'utilisation des terres pour le nord du Yukon et le bassin de la rivière Peel; Geoff agit en tant qu'évaluateur du potentiel minéral, alors que Lee est en charge de l'évaluation du potentiel en hydrocarbures.

DIFFUSION DE L'INFORMATION

La Commission géologique du Yukon diffuse de l'information en trois formats : 1) les cartes et rapports sur papier sont vendus par le Bureau d'information et des ventes en géoscience; 2) la plupart de nos publications et bases de données récentes sont disponibles en format numérique à prix réduit; et 3) plusieurs de nos publications sont disponibles sans frais sous format PDF sur notre site internet (<http://www.geology.gov.yk.ca>). La liste des rapports d'évaluation de propriétés minières disponibles en format numérique est maintenant aussi offerte par internet (<http://www.emr.gov.yk.ca/library>).

Nous sommes fier de diffuser de l'information géospatiale par l'entremise de notre service de carte interactive ('Map Gallery'), que l'on accède par le site internet de la CGY. Ce site de carte interactive est continuellement le sujet d'améliorations; nous apprécions les commentaires des usagers.

Les publications de la Commission géologique du Yukon sont diffusées par le Bureau d'information et des ventes en géoscience. Elles sont disponible à l'adresse suivante :

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le ministère de l'Énergie, des Mines et des Ressources
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