

# GOVERNMENT

## Yukon Geological Survey

*Grant Abbott and staff*  
Yukon Geological Survey

Overview .....	57
Projects .....	58
Programs .....	62
Information management and distribution .....	63
2006 publications and maps .....	66

## La Commission géologique du Yukon

*Grant Abbott et Maurice Colpron*  
La Commission géologique du Yukon

Sommaire d'activités .....	73
Travaux sur le terrain .....	73
Diffusion de l'information .....	76

## Robert E. Leckie Awards for Outstanding Reclamation Practices

*Judy St. Amand*  
Mining Lands, Energy, Mines and Resources

Outstanding Quartz Reclamation .....	77
Outstanding Placer Reclamation .....	78



# Yukon Geological Survey

## *Grant Abbott<sup>1</sup> and staff*

Abbott, J.G. and staff, 2007. Yukon Geological Survey. *In: Yukon Exploration and Geology 2006*, D.S. Emond, L.L. Lewis and L.H. Weston (eds.), Yukon Geological Survey, p. 57-71.

## OVERVIEW

The Yukon Geological Survey (YGS; Fig. 1) is recovering from the tragic loss of Geoff Bradshaw, our Mineral Assessment Geologist, in a helicopter accident over the summer. We thank so many of our colleagues in the geological and mining communities for their tremendous sympathy and support. We are also adjusting to the departure of geologists Craig Hart and Julie Hunt to the sunny climes of Australia. We wish them well, and thank them for their significant contributions to Yukon geology. We welcome three new staff: Carrie Labonte took over from Monique Raitchey in March as office manager; Aubrey Sicotte came on board in January 2007 as spatial data administrator; and Yana Fedortchouk joined us for six months as a project geologist.

YGS has a new organizational structure (Fig. 2) with four main subdivisions. New responsibilities go to Mike Burke as Acting Head of Mineral Services; Diane Emond as Acting Head of Technical



**Figure 1.** Yukon Geological Survey staff from left to right: Grant Abbott, Tiffani Fraser, Don Murphy, Charlie Roots, Tammy Allen, Mike Burke, Lee Pigage, Karen Pelletier, Carrie Labonte, Lara Lewis, Jeff Bond, Olwyn Bruce, Leyla Weston, Panya Lipovsky, Diane Emond, Steve Israel, Ali Wagner, Maurice Colpron, Steve Traynor, Bill LeBarge, Rod Hill, Robert Deklerk. Absent: Grant Lowey, Yana Fedortchouk.

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Services; Don Murphy as Acting Head of Regional Geology; and Lee Pigage as Acting Head of Resource Assessments and Outreach.

YGS continued to enjoy stable core funding, and also benefited significantly from the DIAND Targeted Investment Program under the Strategic Investments in Northern Economic Development (SINED) Fund. SINED funding enabled us to undertake large geochemical and geophysical surveys that would not have otherwise been possible.

The Technical Liaison Committee to the YGS reviews our program twice a year. We are grateful to Chair Gerry Carlson and the committee for their valuable support and constructive advice. This year Greg Lynch from Shell Canada joined the committee to represent Oil and Gas interests. Other members are Rob Carne, Shawn Ryan, Al Doherty, Jean Pautler, Forest Pearson, Jim Mortensen and Jim Christie.

## PROJECTS

The YGS completed or supported 24 field projects in 2006. They are listed on the following pages. This year included a diversity of work that reflects our mandate to 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, an aeromagnetic survey and topical geology studies. However, with the tragic events of the summer, and departure of key staff, our capacity to undertake mineral deposits studies has been significantly diminished.

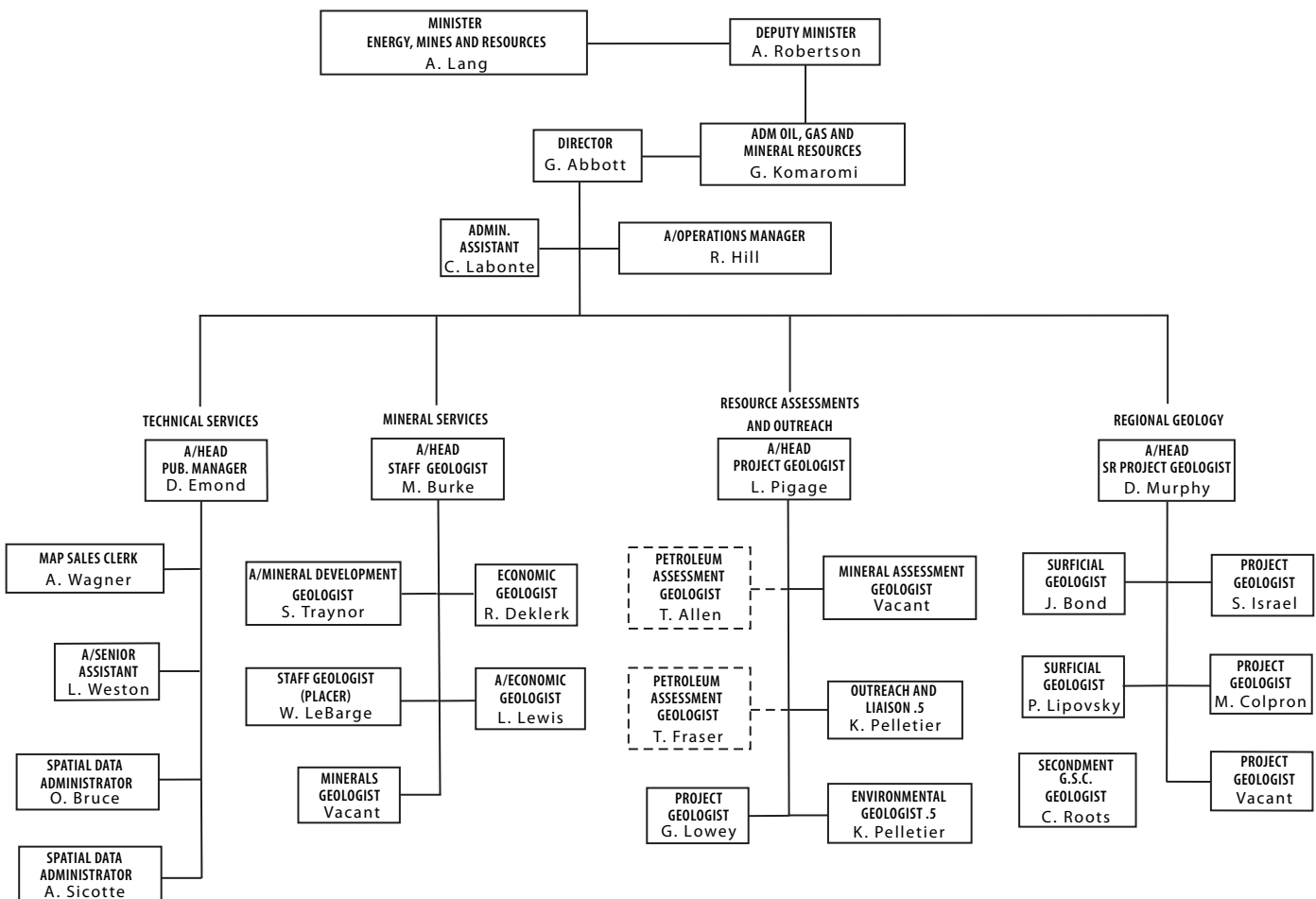


Figure 2. Yukon Geological Survey organization chart.

## BEDROCK MAPPING

1. **Maurice Colpron** teamed up with **Steve Gordey** (Geological Survey of Canada [GSC]), **Grant Lowey**, **Steve Piercey** (Laurentian University) and **Don Murphy** to map the northwestern portion of Whitehorse Trough. This map provides ground control of the bedrock geology along the western portion of the seismic survey acquired in 2004 by GSC/YGS. Compilation and interpretation of the various geoscience datasets is underway and will provide the basis for reassessing the oil and gas potential of northern Whitehorse Trough.

2. **Lee Pigage** began a mapping project in the Otter Creek area (NTS 95D/6) of southeast Yukon. This project is a continuation of his earlier work in the Pool Creek and Toobally Lakes areas, and will improve our understanding of structure, stratigraphy and mineral potential of the southeast margin of Selwyn Basin.

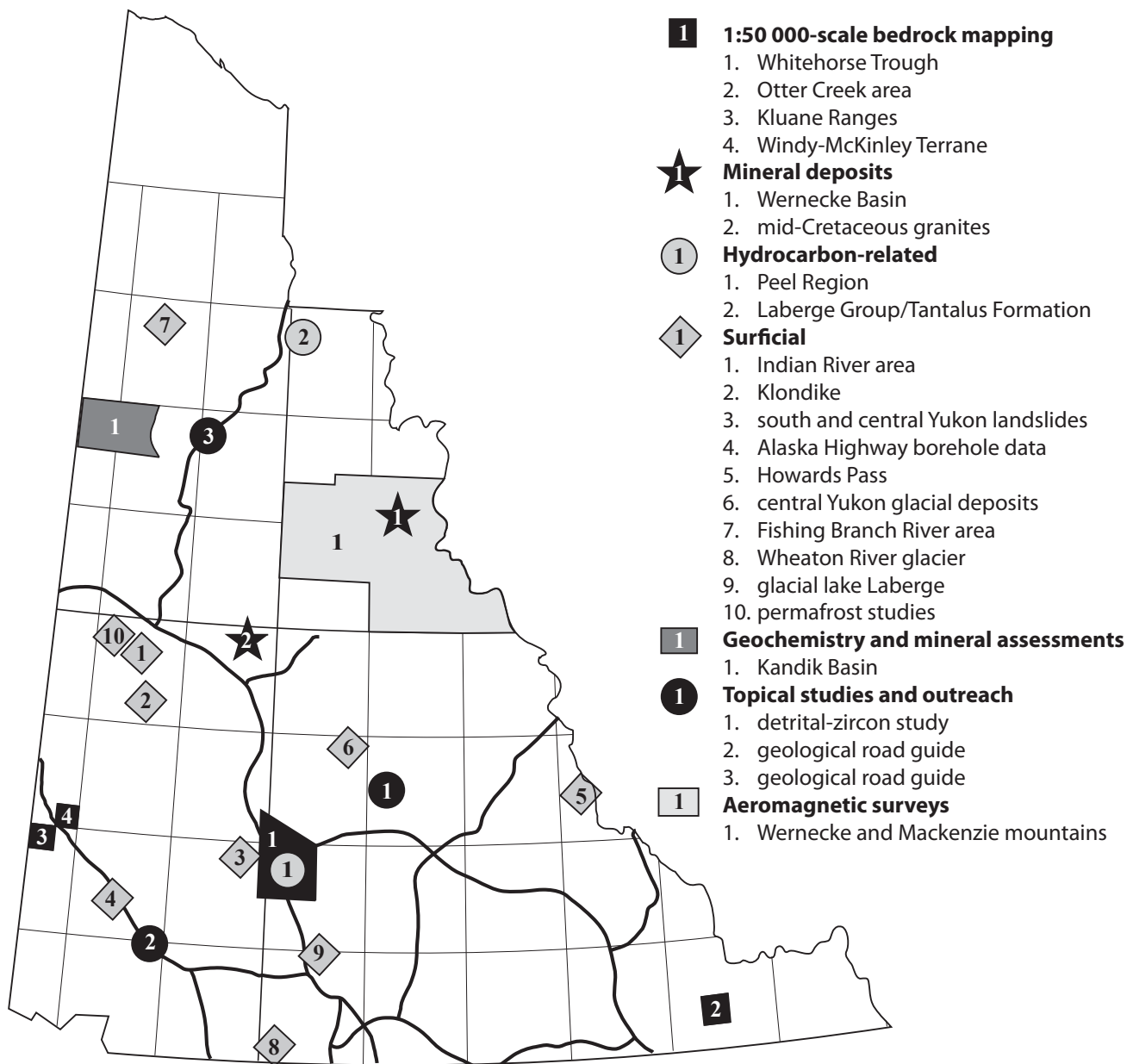


Figure 3. Field projects carried out or sponsored by the Yukon Geological Survey in 2006.

3. **Steve Israel** continued mapping in the Kluane Ranges, focusing on Late Paleozoic strata of the Skolai Group east of the White River where it is host to Triassic mafic-ultramafic intrusions that host nickel, copper and platinum-group-element mineralization. In conjunction with **Jim Mortensen** of the University of British Columbia (UBC), this project is also examining the provenance of Wrangell Terrane through detrital-zircon studies of Middle Triassic and Late Paleozoic sedimentary deposits. Studies of the young deformation associated with the Denali Fault are also taking place in collaboration with **Don Murphy** (YGS) and workers from the USGS in Alaska.
4. **Don Murphy** conducted a reconnaissance of the poorly exposed, poorly understood Windy-McKinley Terrane. As originally defined in central Alaska, the Windy and McKinley terranes comprise ophiolitic rocks of unknown age, and mélangé and flysch of Mesozoic age. Little is known about the original relationships, if any, between these components and adjacent rocks of Yukon-Tanana Terrane. Don's work will document the nature of these assemblages in Yukon, thereby providing a basis for mineral exploration decisions and land-use planning in the area.

#### MINERAL DEPOSIT STUDIES

1. **Lara Lewis** gathered data on intrusion-related and Wernecke Breccia uranium occurrences for a compilation on uranium exploration in Yukon. She is studying the enigmatic uranium occurrences associated with Wernecke Breccia. New U-Pb dates for uranium mineralization are expected to provide constraints on timing of mineralizing events.
2. **Jake Hanley** and **Ed Spooner** (University of Toronto) are continuing a post-doctoral study of the evolution and generation of magmatic fluids in mid-Cretaceous granites in Yukon and their relationship to gold mineralization.

#### HYDROCARBON-RELATED STUDIES

1. **Tammy Allen** and **Tiffani Fraser** began a four-year project assessing the hydrocarbon potential of the Peel Region in northeastern Yukon. The study involves collaboration with the GSC, the Northwest Territories Geoscience Office, industry and university affiliates. The focus this year is the Upper Devonian – Lower Carboniferous Tuttle Formation. A major objective of this project is to assess the Tuttle as a potential petroleum reservoir, and to examine neighbouring units as petroleum sources. Another objective is to clarify stratigraphic relationships and sedimentology of Upper Paleozoic strata.
2. **Grant Lowey** continued studies of the sedimentology, stratigraphy and hydrocarbon potential of the Laberge Group and Tantalus Formation in the Whitehorse Trough, where studies last year discovered petroleum fluid inclusions and identified two potential petroleum source rocks. He also assisted M. Colpron in 1:50 000-scale bedrock mapping of the northern part of this frontier petroleum basin.

#### SURFICIAL STUDIES

1. Yukon Geological Survey placer geologist **William LeBarge**, **Dr. Vladimir Naumov** (Perm University, Russia) and **Dr. Rob Chapman** (University of Leeds, United Kingdom) are studying the sedimentology, stratigraphy and gold characteristics of gravel and conglomerate deposits in the Indian River area. These gravel terraces and the underlying conglomerates are currently the focus of exploration by Boulder Mining Corporation and Klondike Star. New interpretations of geology and data from this study will further characterize the nature of the placer gold distribution in the Indian River drainage and may help to identify new placer reserves, locally, and in nearby drainages. This research complements a study by **Dr. Jim Mortensen** at UBC, focusing on the trace-element characteristics of placer gold in the Klondike, which may help to reveal potential undiscovered lode gold sources.



2. **Jeff Bond**, in partnership with **Paul Sanborn** and **Scott Smith**, continued their studies of the unglaciated soils in the Klondike. This year, Jeff undertook a geochemical investigation of the soils at the original Boulder Lode mine site on the Lone Star property. In addition, upland cryosols (permafrost-affected soils) were studied on the Lone Star property. Assisting with this investigation is **Kathryn Denomme** from the University of Waterloo. Her undergraduate thesis involves mapping the surficial materials on a typical north-facing unglaciated slope from the Lone Star property.
3. **Panya Lipovsky** continued work monitoring permafrost-thaw-related landslides in south and central Yukon. In collaboration with C-CORE and the European Space Agency, InSAR, remote sensing technology and high-precision GPS surveys were used to monitor small-scale ground movements at five landslide sites near Beaver Creek, Carmacks and Little Salmon Lake. A reconnaissance inventory of landslides in the Pelly River watershed was also undertaken.
4. **Erin Trochim** and **Panya Lipovsky** continued their compilation of Yukon Department of Highways borehole data to capture detailed geotechnical and permafrost information. Their work has extended the data set to cover the Alaska Highway from Beaver Creek to east of Haines Junction.
5. **Derek Turner** and **Brent Ward** (Simon Fraser University), and **Jeff Bond** began a study looking at the glacial history of the Howards Pass property in the Selwyn Mountains. The work is being completed through Derek Turner's MSc thesis. His project involves reconstructing the late glacial history of the Selwyn Lobe of the Cordilleran ice sheet, mapping the surficial geology of Pacifica Resources' property and conducting a mobile metal ion geochemistry case study across the SEDEX deposit.
6. **Brent Ward** and **Jeff Bond** continued their investigation into the age of Reid glacial deposits in central Yukon. This involved sampling for cosmogenic dating and tephra chronology in the Pelly River area.
7. **Nicholas Utting** and **Ian Clark** (University of Ottawa), in cooperation with YGS, conducted a study on the water chemistry and noble gases in perennial springs at Bear Cave Mountain, Fishing Branch River area. This work is to address First Nation concerns about potential disturbance of groundwater during hydrocarbon exploration.
8. **Monica Bruckner**, **Mark Skidmore** and **Jeff Bond** – Monica conducted her Master's thesis field research (Montana State University) on one of the Wheaton River glaciers this past summer. She is investigating the biogeochemical characteristics of meltwater in a deglaciating basin.
9. **Stephen Horton** (University of Victoria), **Jeff Bond** and **Peter Von Gaza** (Geomatics Yukon) – Stephen's undergraduate research involves reconstructing the paleogeography of glacial lake Laberge.
10. **Dr. Antoni Lewkowicz** and graduate students from the University of Ottawa continued with a number of permafrost studies around the Territory. They have been documenting the effects of the 2004 forest fires near Dawson on slope stability and sedimentation into watercourses, investigating the origin and dynamics of thermokarst lakes and palsas in the Wolf Creek watershed near Whitehorse, and developing regional permafrost modelling/mapping techniques. Geophysical investigations of permafrost landforms and recent landslides were also carried out in collaboration with **Bernd Etzelmüller** (University of Oslo, Norway) and YGS personnel.
11. **Panya Lipovsky** and **Jeff Bond** are compiling a digital surficial geology map for the entire Yukon, with funding from DIAND under the Strategic Initiatives for Northern Economic Development Program (SINED).

## TOPICAL STUDIES AND OUTREACH

1. **Luke Beranek**, a UBC PhD candidate with **Jim Mortensen**, has been steadily adding to the detrital-zircon database for Late Paleozoic and Triassic rocks on both sides of the boundary between the North American continental margin sequence and Slide Mountain and Yukon-Tanana terranes. Luke's 2005 work showed that the terranes were already shedding debris into North America by the Early Triassic, substantially earlier than previously thought. This season, Luke collected samples from occurrences of Triassic rocks in the Pelly, Selwyn and Ogilvie mountains.

2,3. **Karen Pelletier** and **Charlie Roots** (GSC) began work on a Yukon geological road guide this summer by scouting appropriate geological stops of interest along most roadways in Yukon. Charlie, along with **Tiffani Fraser** and **Tammy Allen**, also contributed to the Dempster Highway Log being prepared jointly with GSC/NWT. A draft of the guide, entitled *Roadside Geology of the Dempster Highway, Northwest Territories and Yukon: A traveller's guide to the Geology of Canada's most northwestern road link*, will be available for use by tourists for spring 2007, along with accompanying road brochures for designated highway segments. The final product is projected to be complete by spring 2008.

## REGIONAL GEOCHEMISTRY AND MINERAL ASSESSMENTS

1. GSC, in collaboration with **Geoff Bradshaw**, completed a stream geochemical survey of an area covering the Kandik Basin in northcentral Yukon, south of Fishing Branch Territorial Park. Funding for the survey was provided by DIAND through SINED. Results will be released in late spring 2007.

## AEROMAGNETIC SURVEYS

1. GSC, in collaboration with YGS, began an extensive aeromagnetic survey in the Wernecke and Mackenzie mountains. Funding was provided by DIAND under SINED. Inclement weather during the summer prevented completion of the survey. Completion is now expected in early 2007, with results released in late summer.

## PROGRAMS

### MINING AND PETROLEUM ENVIRONMENT RESEARCH GROUP (MPERG)

MPERG is a cooperative working group made up of government agencies, environmental, mining and petroleum resource companies, Yukon First Nations and Non-Government Organizations (NGOs). It was established to promote research into environmental issues for mining and petroleum development in the Yukon. Participants bring together their resources and knowledge to work cooperatively on industry-related environmental issues and projects. MPERG creates a favourable environment to facilitate finding solutions before environmental problems arise. The group is funded by

YGS and chaired by Grant Abbott, with administrative support from Karen Pelletier.

Five studies were approved for funding for 2006/07:

- John L. Bailey: Yukon River Basin Stream Bioassessment Modeling and Placer Mining Stream Gradient Analysis
- The Yukon Government Oil and Gas Management Branch: Preliminary Investigation of Seismic Lines and associated disturbances in the Eagle Plains and Peel Plateau regions of North Yukon
- EDI Environmental Dynamics Inc in partnership with Devon Energy Corp., Environment Canada, and the Yukon Department of Transportation and Engineering: Regeneration effects of Linear Development Subject to Wildfires in Continuous Permafrost Zones
- Gartner Lee Ltd.: Regional Water Quality Assessment of the South Macmillan River Watershed
- Laberge Environmental Services: Follow-up monitoring: Pilot Sale Erosion Control at Gold Run Creek and Shrub Trial Plots at Brewery Creek Mine

## YUKON MINING INCENTIVES PROGRAM

The Yukon Mining Incentives Program (YMIP) is currently administered by Steve Traynor. This year, funding was offered to 53 of 62 applicants, for a total of \$880 600. Proposals approved for funding included 5 under the Grassroots-Prospecting module, 17 under the Focused Regional module, and 31 under the Target Evaluation module.

Gold continued to be the main commodity of exploration interest and was the focus of 34 of the projects which received approval for YMIP funding. Projects targeting copper and zinc-lead accounted for nine and six projects, respectively. Two applicants explored for gemstones; one applicant explored for molybdenum and another for uranium. This year saw an increase in approved applicants proposing placer-related projects, with over 25% of the successful applicants undertaking placer exploration and testing programs.

## LIAISON TO INDUSTRY, FIRST NATIONS AND THE PUBLIC

The 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. Products developed this year to increase public awareness of the geology and mineral resources of the Yukon include new commodity and mineral potential brochures. Upgrades to our websites will be in place by the end of March.

Karen Pelletier also reviews Mining Land Use and Water License applications, and monitors reclaimed sites to document the effectiveness of mitigation practices. As well, she represents the YGS on several committees which sponsor environmental research involving 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 the YGS and others, and rapidly evolving digital technology, the Survey continues to put significant resources into making geological information more accessible. Our website and Map Gallery are both undergoing substantial revisions that will make them easier to use and provide greater online functionality to the MINFILE and publications databases. A large part of our effort has gone into developing and maintaining key databases and making all of our information internet-accessible. Ongoing activities include support for the H.S. Bostock Core Library and the Energy, Mines and Resources (EMR) library (Elijah Smith Building) in Whitehorse.

### DATABASES

Yukon MINFILE is a database containing over 2600 records on Yukon's mineral occurrences. It is maintained by Robert Deklerk and Lara Lewis. Recent efforts have gone toward making the database fully searchable online. As a result, the most current CD-ROM release dates back to November 2005, and will likely be the last CD-ROM of

the database we release. Online searching of the database will allow the user to access the most complete and up-to-date data, as it will link to a non-static dataset. This new direction has required conversion of the database from Access to Oracle and the standardization of data and data fields. The online search is expected to be completed in mid-2007.

The Yukon Placer Database, compiled by Bill LeBarge, was updated and a new version was released in May, 2006. 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 457 streams and rivers, and 1443 associated placer occurrences, of which 130 were updated for this version. It also includes location maps in Portable Document Format (PDF). A new release is planned for spring 2007, which will include detailed updated information from placer mining activity between 2003 and 2006.

YGS, in partnership with the GSC, is in the process of updating the Yukon Digital Geology compilation, which was last revised in 2003. The revised database will not only incorporate recent maps, but will also conform to the North American Data Model. This standard, which is slowly being adopted by geological surveys across North America, allows users to generate a seamless map from more than one source (i.e., two or more jurisdictions). The model will allow the selection of subsets of data to generate maps defined by lithology, age or map unit. It will also be possible to create generalized maps through a hierarchy of attributes (i.e., Group *versus* Formation or Paleozoic *versus* Devonian). The new map database is expected to be available online by April, 2007.

Jeff Bond and Panya Lipovsky began development of a Digital Surficial Geology Map of the Yukon, in partnership with the GSC, and with SINED funding. The map database will have the same functionality as the bedrock database. The release is planned for early 2008.

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 can be viewed online through the Map Gallery and is available on CD-ROM in Microsoft Excel 2000 format and in ESRI ArcView Shapefile format.

The YukonAge Database, compiled by Katrin Breitsprecher and Jim Mortensen at the University of British Columbia, with funding from the YGS, was

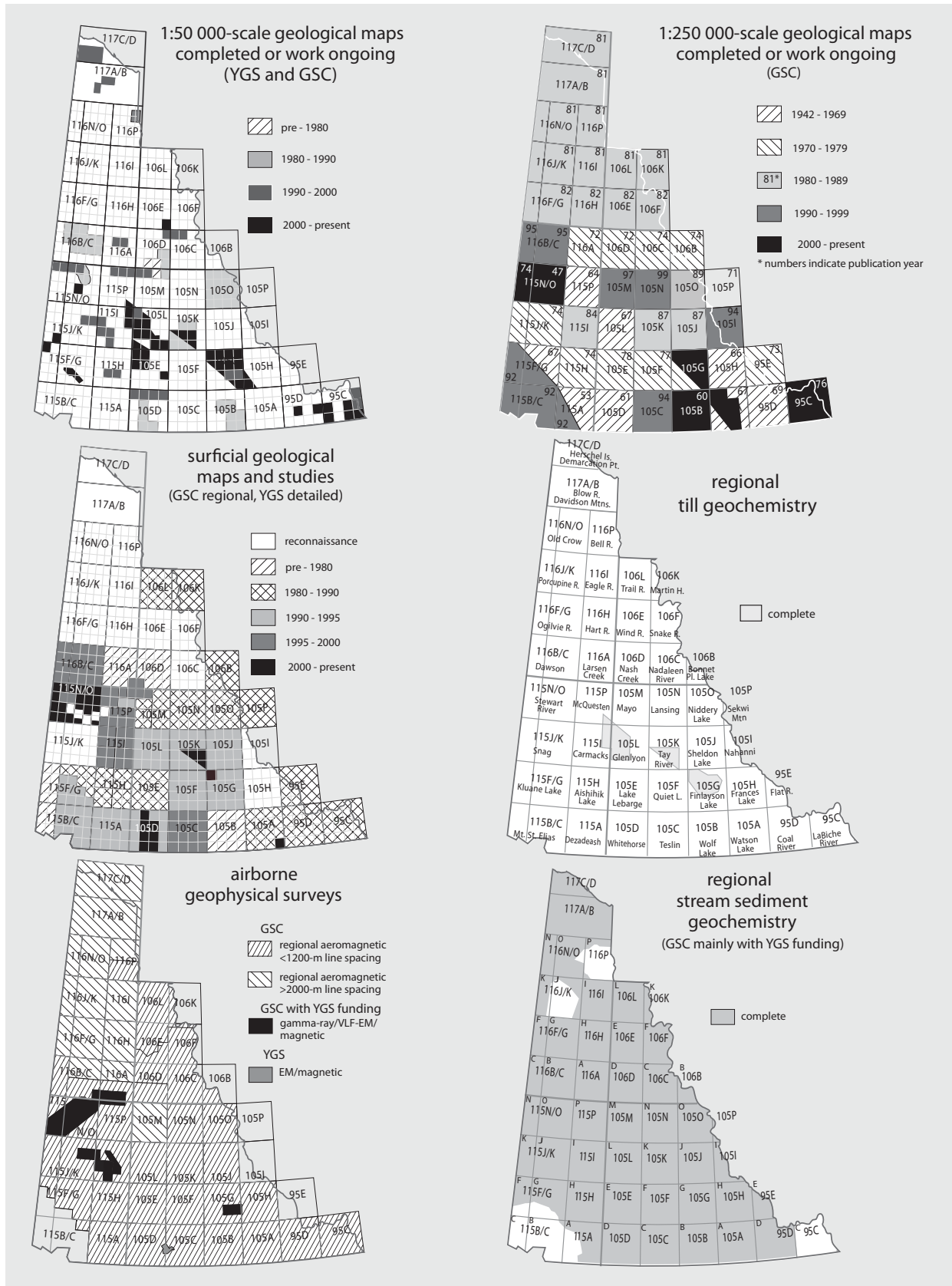


Figure 4. Summary of available geological maps, and regional geochemical and geophysical surveys in the Yukon.

updated in 2004. It can be viewed on 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 is available online. It is current and contains almost 8000 references to papers on Yukon geology and mineral deposits, including YGS publications.

All open assessment reports (more than 5000) are now in PDF format and accessible over the internet through the EMR library website. In the Yukon, reports remain confidential for five years. 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 maintains 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 Yukon Energy, Mines and Resources Library is the Yukon's largest scientific library and an invaluable resource. It is located in Room 335 of the Elijah Smith Building and is open to the public. The Library provides access to Yukon Mining Assessment reports, maps (geology, topographic and aeromagnetic), and aerial photographs. It holds many geology journals and a good selection of materials on general geology, Yukon geology and economic geology. The Library is also the access point for Faro exploration records. In addition to geological information, the Library has books, reports, and journals in other areas: oil and gas, forestry, agriculture and energy, as well as a very comprehensive collection of Yukon publications.

### **INFORMATION DISTRIBUTION**

The 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](http://www.geology.gov.yk.ca)), free of charge. A catalogue of assessment reports is also available online ([www.emr.gov.yk.ca/library](http://www.emr.gov.yk.ca/library)).

We are pleased to make spatial data available through our interactive map server, the Map Gallery, which can be accessed through the YGS website. We are continuing to improve the Map Gallery and 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  
Fax (867) 667-5150  
E-mail: [geosales@gov.yk.ca](mailto:geosales@gov.yk.ca)

To access publications and to learn more about the Yukon Geological Survey visit our website at [geology.gov.yk.ca](http://geology.gov.yk.ca), or contact us directly:

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

## 2006 PUBLICATIONS AND MAPS

### YGS ANNUAL REPORTS

Emond, D.S., Bradshaw, G.D., Lewis, L.L. and Weston, L.H. (eds.), 2006. Yukon Exploration and Geology 2005, Yukon Geological Survey, 339 p.

Burke, M., LeBarge, W., Traynor, S., Abbott, G., Colpron, M. and St. Amand, J., 2006. Yukon Mining, Development and Exploration Overview 2005, Yukon Geological Survey, 75 p.

Traynor, S. (compiler), 2006. Yukon Mineral Deposits 2006, Yukon Geological Survey, 14 p.

### 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. (compilers), 2006. Yukon Placer Database 2006 – Geology and mining activity of placer occurrences, Yukon Geological Survey, CD-ROM.

### YGS OPEN FILES

Bond, J.D. and Sanborn, P.T., 2006. Morphology and geochemistry of soils formed on colluviated weathered bedrock: Case studies from unglaciated upland slopes in west-central Yukon, Yukon Geological Survey, YGS Open File 2006-19.

Bond, J.D. and Church, A., 2006. McConnell ice-flow and placer activity map, Big Salmon Range, Yukon (1:100 000 scale), Yukon Geological Survey, YGS Open File 2006-20.

Colpron, M. (compiler), 2006. Tectonic assemblage map of Yukon-Tanana and related terranes in Yukon and Northern British Columbia (1:1 000 000 scale), Yukon Geological Survey, YGS Open File 2006-1.

Friske, P.W.B., McNeil, R.J., McCurdy, M.W., Wilson, R.S. and Day, S.J.A., 2006. Geochemical Data from a National Geochemical Reconnaissance Stream Sediment and Water Survey in the Yukon Portion of the Flat River Map Area, Southeast Yukon Territory (Part of NTS 95E), Yukon Geological Survey, YGS Open File 2006-18/GSC Open File 5329, CD-ROM.

Friske, P.W.B., McNeil, R.J., McCurdy, M.W., Wilson, R.S. and Day, S.J.A., 2006. Geochemical Data from a National Geochemical Reconnaissance Stream Sediment and Water Survey in the Area of Old Crow, Northern Yukon Territory (Parts of 116J, 116K, 116N, 116O, 116P, 117A, 117B), Yukon Geological Survey, YGS Open File 2006-17/GSC Open File 5319, CD-ROM.

### YGS MINERAL ASSESSMENT OPEN FILES

*These have been worked on over the last 10 years and were released in 2006.*

Fonseca, A., 2006. Mineral Assessment of the Ddhaw Ghro Habitat Protection Area, Yukon, Yukon Geological Survey, YGS Open File 2006-5.

Fonseca, A., 2006. Mineral Assessment of the proposed Frances Lake Special Management Area, Yukon, Yukon Geological Survey, YGS Open File 2006-6.

Fonseca, A., 2006. Protected Areas in Canada, Yukon Geological Survey, YGS Open File 2006-14.

Héon, D., 2006. Mineral Assessment of the Tombstone Study Area, Yukon, Yukon Geological Survey, YGS Open File 2006-2.

Héon, D., 2006. Mineral Assessment of the Eagle Plain Study Area, Yukon, Yukon Geological Survey, YGS Open File 2006-3.

Héon, D., 2006. Mineral Assessment of the Northern Klwane Wildlife Sanctuary, Yukon, Yukon Geological Survey, YGS Open File 2006-4.

Héon, D., 2006. Isotope dating of lead-zinc occurrences in the Bonnet Plume area, Preliminary report, Yukon Geological Survey, YGS Open File 2006-16.

Héon, D. and Sax, K., 2006. Investigations of 2000 RGS survey, Northern Yukon, Eagle Plains Ecoregion, Yukon Geological Survey, YGS Open File 2006-15.

Hulstein, R., 2006. Report on the Detailed Mineral Assessment of the Proposed Kusawa Natural Environment Park Special Management Area, Yukon, Yukon Geological Survey, YGS Open File 2006-7.

Hulstein, R., vanRanden, J., Stroshein, R. and Andersen, F., 2006. Report on 2002 Geochemical Procedures used during Mineral Resource Assessments, Yukon Geological Survey, YGS Open File 2006-13.



- Stroshein, R., 2006. Report on the Detailed Mineral Assessment of the Proposed Lewes Marsh/McClintock Bay and Tagish River Special Management Areas, Yukon, Yukon Geological Survey, YGS Open File 2006-9.
- Stroshein, R., 2006. Report on the Detailed Mineral Assessment of the Proposed Scottie Creek Special Management Area, Yukon, Yukon Geological Survey, YGS Open File 2006-12.
- Stroshein, R. and Hulstein, R., 2006. Report on the Detailed Mineral Assessment of the Proposed Pickhandle Lakes Special Management Area, Yukon, Yukon Geological Survey, YGS Open File 2006-10.
- Stroshein, R. and Hulstein, R., 2006. Report on the Detailed Mineral Assessment of the Proposed Wellesley Lake Special Management Area, Yukon, Yukon Geological Survey, YGS Open File 2006-11.
- vanRanden, J., 2006. Report on the Detailed Mineral Assessment of the Proposed Snafu/Tarfu Natural Environment Park Special Management Area, Yukon, Yukon Geological Survey, YGS Open File 2006-8.
- YGS CONTRIBUTIONS TO OUTSIDE PUBLICATIONS**
- Colpron, M.**, 2006. Contexte géodynamique du terrane de Yukon-Tanana, Cordillère canadienne: Faculté des Sciences et Techniques de Marrakech, Deuxièmes Journées De Launay, Marrakech, Morocco, p. 18-19.
- Buffett, G., White, D., Roberts, B. and **Colpron, M.**, 2006. Preliminary results from the Whitehorse Trough seismic survey, Yukon Territory. Geological Survey of Canada, Current Research, 2006-A2, 9 p.
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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., 2007. La Commission géologique du Yukon. *Dans : Yukon Exploration and Geology 2006*, D.S. Emond, L.L. Lewis et L.H. Weston (réds.), la Commission géologique du Yukon, p. 73-76.

## SOMMAIRE D'ACTIVITÉS

La commission géologique du Yukon (CGY) se remet de la perte tragique de notre géologue d'évaluation des ressources minérales, Geoff Bradshaw, dans un accident d'hélicoptère au cours de l'été dernier. Nous remercions les nombreux collègues et amis des communautés géologique et minière pour leur incroyable support. Nous nous ajustons aussi aux départs de deux de nos géologues, Craig Hart et Julie Hunt; nous leur souhaitons du succès sous le soleil d'Australie et les remercions pour leurs importantes contributions à la géologie du Yukon. Toutefois, jusqu'à leur remplacement, notre capacité de conduire des études de gîtes minéraux en sera réduite.

La CGY opère maintenant selon un nouvel organigramme comprenant quatre services. Les responsabilités de gérance des Services minéraux revient maintenant à Mike Burke en tant que chef intérimaire; alors que Diane Emond est chef des Services techniques, Don Murphy est chef du Service de géologie régionale, et Lee Pigage est chef du Service d'évaluation des ressources et des relations publiques.

## TRAVAUX SUR LE TERRAIN

### CARTOGRAPHIE DU SUBSTRATUM ROCHEUX

1. **Maurice Colpron** a collaboré avec **Steve Gordey** (commission géologique du Canada [CGC]), **Grant Lowey**, **Steve Piercey** (université Laurentienne) et **Don Murphy** pour cartographier la partie nord-ouest de la fausse de Whitehorse. Cette cartographie complète les contôles de surface de la géologie le long de la partie ouest du relevé sismique acquit en 2004 par la CGY et la CGC. La compilation et l'interprétation des diverses données géoscientifiques sont en cours; elles formeront la base d'une réévaluation du potentiel pétrolier de la fausse de Whitehorse septentrionale.
2. **Lee Pigage** a entamé la cartographie de la région d'Otter Creek (STN 95D/6) dans le sud-est du Yukon. Ce projet continue ses travaux antérieurs dans les régions de Pool Creek et de Toobally Lakes. Il permettra d'améliorer nos connaissances de la stratigraphie, la structure, et le potentiel minéral à la limite sud-est du bassin de Selwyn.

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3. **Steve Israel** a continué la cartographie des monts Kluane, se concentrant cette année sur les strates Paléozoïques tardive du Groupe de Skolai à l'est de la rivière White. Dans cette région, ces strates contiennent des intrusifs mafiques à ultramafiques du Trias minéralisés en nickel-cuivre et éléments du groupe du platine. Ce projet examine aussi la provenance des strates sédimentaires du Paléozoïque tardif et du Trias moyen du terrane de Wrangel, à l'aide des zircon détritiques et en collaboration avec **Jim Mortensen** (université de Colombie-Britannique). L'étude de la déformation récente le long de la faille de Denali est aussi en cours en collaboration avec **Don Murphy** et des collègues du USGS en Alaska.
4. **Don Murphy** a conduit une cartographie de reconnaissance du terrane de Windy-McKinley : une région avec peu d'affleurements, donc peu connue. Tels que définis dans le centre de l'Alaska, les terranes de Windy et de McKinley comprennent des roches ophiolitiques d'âge inconnu, et du mélange et du flysch du Mésozoïque. On en sait peu sur les relations originelles entre ces diverses composantes, et entre celles-ci et le terrane de Yukon-Tanana. Les travaux de Don permettront d'établir la nature de ces assemblages au Yukon, et d'assister l'exploration minérale et la planification d'usage des terres dans la région.

### ÉTUDES DE GÎTES MINÉRAUX

1. **Lara Lewis** a recueillie des données de terrain sur les indices d'uranium associés aux brèches de Wernecke et reliés aux intrusions, dans le cadre d'une compilation portant sur l'exploration pour l'uranium au Yukon. De nouvelles datations de la minéralisation en uranium devraient établir la chronologie des événements minéralisateurs.
2. **Jake Hanley** et **Ed Spooner** (université de Toronto) poursuivent une étude post-doctorale portant sur l'origine et l'évolution des fluides magmatiques, et leurs relations à la minéralisation aurifère dans les granits du Crétacé moyen au Yukon.

### ÉTUDES PORTANT SUR LES HYDROCARBURES

1. **Tammy Allen** et **Tiffani Fraser** ont entamées une étude de quatre ans portant sur l'évaluation du potentiel en hydrocarbures de la région de Peel, dans le nord-est yukonnais. Ce projet est une collaboration de la CGY avec la CGC, le centre géoscientifique des Territoires du Nord-Ouest, et des partenaires industriels et universitaires. Cette année, Tammy et Tiffani ont concentrées leurs efforts sur la Formation de Tuttle, d'âge Dévonien tardif à Mississipien précocé. Les principaux objectifs de ce projet sont : a) d'évaluer le potentiel de la Formation de Tuttle en tant que réservoir pétrolier ; b) d'examiner les unités avoisinantes en tant que sources possible de pétrole ; et c) d'éclaircir les relations stratigraphiques et sédimentologiques entre les strates Paléozoïques supérieures de la région.
2. **Grant Lowey** a poursuivi ses études de la sédimentologie, la stratigraphie, et le potentiel en hydrocarbures du Groupe de Laberge et de la Formation de Tantalus dans la fausse de Whitehorse. Ses études antérieures ont révélées la présence d'inclusions fluides de pétrole et ont identifiées deux unités comme étant des roches sources possibles. Grant a aussi participé à la cartographie géologique de la partie septentrionale de ce bassin inexploré avec Maurice Colpron.

### ÉTUDES DES DÉPÔTS MEUBLES

1. **William LeBarge**, le géologue des placers de la CGY, **Valdimir Naumov** (université de Perm en Russie), et **Rob Chapman** (université de Leeds aux Royaumes Unis) étudient la sédimentologie, la stratigraphie et les caractéristiques de l'or dans les dépôts de graviers et de conglomérats de la région de la rivière Indian. Ces graviers de terrasse, de même que les conglomérats sous-jacents, font présentement l'objet de travaux d'exploration des sociétés de Boulder Mining Corporation et de Klondike Star Ltd. Cette étude devrait engendrer de nouvelles interprétations de la géologie permettant de mieux caractériser la distribution de l'or placérien dans le bassin versant de la rivière Indian et on espère d'identifier de nouvelles ressources en placers dans la région immédiate et dans les ruisseaux avoisinants. Ce projet complète l'étude de **Jim Mortensen** (université de Colombie-Britannique) portant sur la composition en éléments traces de l'or placérien du Klondike ; étude qui pourrait révéler de nouvelles sources d'or filonien.

2. **Jeff Bond** a continué son étude des sols dans les terrains non-glaciaires du Klondike en collaboration avec **Paul Sanborn** et **Scott Smith**. Cette année, Jeff a complété une étude géochimique des sols au site original de la mine Boulder Lode, sur la propriété Lone Star. Il a aussi étudié les sols gelés de plateau de la propriété Lone Star avec l'assistance de **Kathryn Denomme** de l'université de Waterloo. La thèse de baccalauréat de Kathryn porte sur la cartographie des dépôts meubles le long d'une pente d'aspect typique vers le nord sur la propriété Lone Star.
3. **Panya Lipovsky** a continué la surveillance des glissements de terrain reliés à la fonte du pergélisol dans le sud et le centre du Yukon. Grâce aux collaborations de C-CORE et d'InSAR, l'agence spatiale européenne, on a mesuré des mouvements de terrain de petite échelle à l'aide de techniques de télédétection et de relevés SPG de haute précision à cinq endroits près de Beaver Creek, de Carmacks et du lac Little Salmon. Un inventaire des glissements de terrain dans le bassin versant de la rivière Pelly a aussi été entamé.
4. **Erin Trochim** et **Panya Lipovsky** ont continuées leur compilation des données de forages du ministère des routes du Yukon afin d'en capturer des informations détaillées sur la géotechnique et le pergélisol. Ces travaux ont permis d'augmenter la banque de données telle que la route de l'Alaska est maintenant couverte de Beaver Creek jusqu'à l'est de Haines Junction.
5. **Derek Turner** et **Brent Ward** (université Simon Fraser) ont entamés en collaboration avec **Jeff Bond** une étude de l'histoire glaciaire de la propriété d'Howards Pass dans les monts Selwyn. Ces travaux forment la base de la thèse de maîtrise de Derek. Son étude comprend l'évolution tardi-glaciaire du lobe Selwyn de la couverture glaciaire de la cordillère, la cartographie des dépôts meubles sur la propriété de Pacifica Resources, et une étude géochimique des ions métalliques mobiles au travers de ce gisement de type SEDEX.
6. **Brent Ward** et **Jeff Bond** ont poursuivis leur étude portant sur l'âge de dépôts glaciaires de Reid dans le centre du Yukon. La région de la rivière Pelly fût le sujet d'échantillonnage pour des datations cosmogéniques et des téphras.
7. **Nicholas Utting** et **Ian Clark** (université d'Ottawa) étudiant, en collaboration avec la CGY, la composition chimique et en gaz nobles des eaux de sources annuelles de la montagne Bear Cave, dans la région de la rivière Fishing Branch. Ces travaux répondent aux inquiétudes des premières nations vis-à-vis les effets possibles de l'exploration pour les hydrocarbures sur les eaux souterraines.
8. **Monica Bruckner** (université de l'État du Montana) a poursuivie une étude de terrain d'un des glaciers à la source de la rivière Wheaton dans le cadre de sa maîtrise sous la tutelle de **Mark Skidmore** et **Jeff Bond**. Elle étudie les caractéristiques biogéochimiques des eaux de fonte dans un bassin périglaciaire.
9. **Stephen Horton** (université de Victoria) poursuit une étude de baccalauréat portant sur la paléogéographie du lac glaciaire de Laberge avec l'aide de **Jeff Bond** et **Peter Von Gaza** (géomatique Yukon).
10. **Antoni Lewkowicz** et ses étudiants gradués de l'université d'Ottawa ont poursuivie de nombreuses études du pergélisol à travers le territoire. En outre : a) ils enregistrent les conséquences des feux de forêt de 2004 sur la stabilité des pentes et l'accumulation de sédiments dans les ruisseaux ; b) ils étudient l'origine et la dynamique des lacs thermokastiques et des pases dans le bassin du ruisseau Wolf près de Whitehorse ; et c) ils développent des méthodes de cartographie régionale et de modélisation du pergélisol. Des études géophysiques du pergélisol et de glissements de terrain récents ont aussi été conduites en collaboration avec **Bernd Etzelmüller** (université d'Oslo, la Norvège) et les employés de la CGY.
11. **Panya Lipovsky** et **Jeff Bond** compilent une carte des dépôts meubles pour l'ensemble du territoire, à l'aide d'un financement du ministère des affaires indiennes et du nord canadien (MAINC) dans le cadre du programme de développement économique du Nord.

## ÉTUDES DÉTAILLÉES ET RELATIONS PUBLIQUES

1. **Luke Beranek** continue d'augmenter le nombre d'analyses des zircons détritiques dans les roches Paléozoïques tardives et du Trias de part et d'autre de la limite entre la marge continentale nord-américaine et les terranes de Slide Mountain et Yukon-Tanana. Cette étude forme la base de sa thèse de doctorat à l'université de Colombie-Britannique sous la tutelle de **Jim Mortensen**. En 2005, Luke a démontré que des débris provenant des terranes s'accumulaient sur la marge nord-américaine dès le Trias précoce, beaucoup plus tôt que l'on le croyait auparavant. La saison dernière, il a étendu son échantillonnage aux roches triassiques des monts Pelly, Selwyn et Ogilvie.
2. **Karen Pelletier** et **Charlie Roots** (CGC) ont entamés un guide géologique des routes yukonaises en visitant les sites géologiques d'intérêts le long de la plupart des routes du Yukon. Charlie s'est joint à **Tiffani Fraser** et **Tammy Allen** pour la préparation d'un guide de la route Dempster en collaboration avec la CGC et les Territoires du Nord-Ouest ; une version préliminaire de ce guide, de même que d'autres brochures couvrant certains segments des autres routes du Yukon devraient être disponible au publique au printemps 2007. Nous espérons compléter l'ensemble de ce projet pour le printemps 2008.

## GÉOCHIMIE ET ÉVALUATION DU POTENTIEL MINÉRAL

1. La CGC, en collaboration avec **Geoff Bradshaw**, ont complétés un relevé géochimique des ruisseaux pour une région couvrant le bassin de Kandik dans le centre-nord du Yukon, au sud du parc territorial de Fishing Branch. Le financement pour ce relevé provient du programme de développement économique du Nord du MAINC.

## RELEVÉS AÉROMAGNÉTIQUES

1. La CGC, en collaboration avec la CGY, ont débutés un programme majeur de relevés aéromagnétiques des monts Wernecke et Mackenzie. Le financement provient du programme de développement économique du Nord du MAINC. Toutefois, les pauvres conditions météorologiques au cours de l'été dernier ont empêcher la finalisation de ces relevés. On espère maintenant compléter ces relevés au début de 2007 et de publier les résultats vers la fin de l'été.

## 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 ([www.geology.gov.yk.ca](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 ([www.emr.gov.yk.ca/library](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 :

Bureau d'information et des ventes en géosciences  
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le ministère de l'Énergie, des Mines et des Ressources  
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