

**GEOLOGICAL SURVEY OF CANADA
OPEN FILE 1592**

**1986 GREAT LAKES SEISMIC REFLECTION SURVEY
MIGRATED DATA**

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ABSTRACT

As part of the Great Lakes International Multidisciplinary Program on Crustal Evolution (GLIMPCE), approximately 1350 km of deep reflection data were recorded along eight lines in Lakes Superior, Michigan and Huron. The survey was designed to resolve the deep structure of the Midcontinent Rift and the Hemlo and Michipicoten Granite/Greenstone Belts in Lake Superior, the Grenville Front and Huronian continental margin in Lake Huron and the Penokean Orogen and Niagara Fault in Lake Michigan. Data were generated using an approx. 128 litre airgun array, recorded with a 120 channel streamer, conventionally processed in CMP geometry, and migrated. The migrated data presented in this report are plotted at 1:200000. This format allows interested parties to interpret the data independently and to compare directly the results with a wide variety of seismic reflection data being released by other groups.

RÉSUMÉ

Dans le cadre du programme GLIMPCE (Great Lakes International Multidisciplinary Program on Crustal Evolution), environ 1350 km de sismique réflexion profonde furent recueillis le long de huit profils dans les lacs Supérieur, Michigan et Huron. Le levé était destiné à résoudre les structures profondes du rift Keweenawien et des ceintures de roches vertes d'Hemlo et de Michipicoten dans le lac Supérieur, le Front du Grenville et la marge continentale huronienne dans le lac Huron et l'orogénie Pénokéenne et la faille Niagara dans le lac Michigan. Les données furent enregistrées en utilisant un réseau de canons à air d'environ 128 litres comme source et une flûte à 120 canaux comme système d'écoute. Les données furent ensuite traitées conventionnellement selon la géométrie CMP et furent finalement migrées. Les données présentées dans ce rapport sont à l'échelle 1:200000. Ce format permet aux personnes intéressées d'effectuer leur propre interprétation ou encore d'effectuer une comparaison directe avec les autres données de sismique réflexion disponibles.

INTRODUCTION

The Geological Survey of Canada, through its contribution to LITHOPROBE, and the U.S. Geological Survey funded jointly the first experiment of the Great Lakes International Multidisciplinary Program on Crustal Evolution (GLIMPCE). GLIMPCE aims to resolve the structure and evolution of the crust beneath the Great Lakes region. In August and September 1986, approximately 1350 km of deep reflection data were collected along eight profiles using an approx. 128 litre tuned airgun array and a 120-channel data acquisition system. A generalized geological map of the Great Lakes region with the location of the seismic profiles is shown in Figure 1. Seismic reflection profiles A,B,C,F and G are located in Lake Superior, profile H is located in Lake Michigan, and profiles I and J are located in Lake Huron. The survey was designed to resolve the deep crustal structure of the Keweenawan Rift (profiles C,A,G,F and H), the Hemlo and Michipicoten Granite/Greenstone Belts (B), the Grenville Front (J), the Huronian continental margin (I) and the Penokean Orogen and Niagara Fault (H) [3].

Migrated reflection profiles are displayed in this report, and necessary information on data acquisition, processing and display parameters is documented. Details of the conventional CMP processing sequence that led to the stacked seismic sections are given in Lee and others [6]. A summary of the simultaneous acquisition of wide-angle reflection/refraction data by goverment and academic groups is given in Hutchinson and others [5]. No interpretations of GLIMPCE data are given here. Preliminary results have been reported by Behrendt and others [1], Green and others [4] and Cannon and others [2].

EXPÉRIENCE GLIMPCE EXPERIMENT 1986

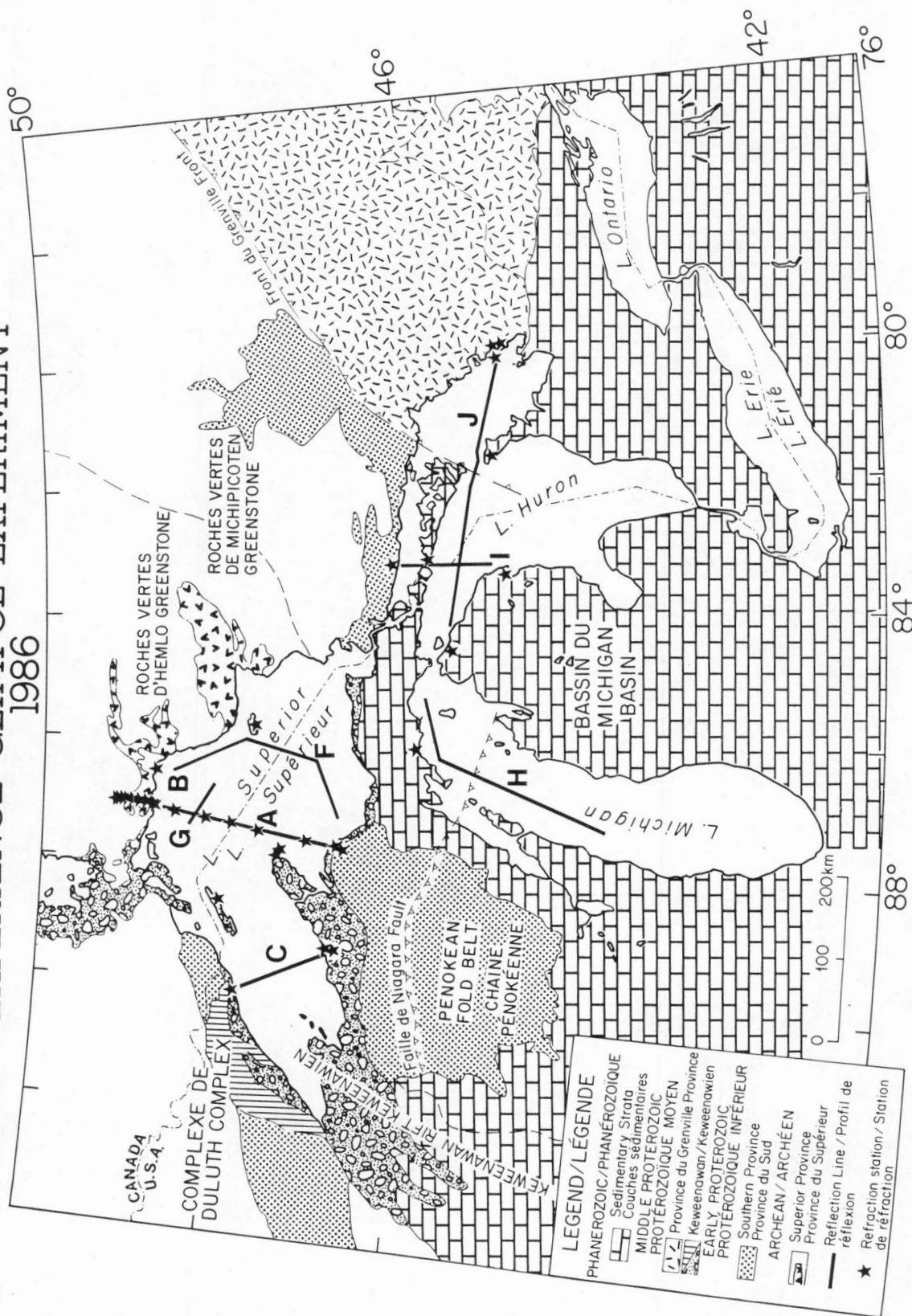


FIGURE 1

DATA ACQUISITION

The marine seismic survey for the Geological Survey of Canada and the U.S. Geological Survey was conducted by Geophoto Services, Ltd. (Calgary). The M/V Fred J. Agnich (Geophoto Party 2995) generated the energy for one line of seismic refraction data and collected 1345.35 km of reflection data during the period of 29/08/1986 to 23/09/1986.

Basic Field Parameters

Vessel	M/V Fred J. Agnich
Source	wide tuned airgun array 127.48 L total volume 60 active guns 80 m array width 6-12 m operating depth 74 m distance: antenna - array 228-236 m distance: array - near group source interval: 50 m or 62.5 m coverage: 3000 or 2400 %
Streamer	3024 m length 120 groups 25 m group length 27 hydrophones/group 10 - 14 m average towing depth

Recording Instrument

Texs Instruments DFS V

120 seismic channels

4 ms sample period

64.0 Hz High-cut

5.3 Hz Low-cut

20 s record length

Navigation

GEONAV, Loran-C

A detailed summary of shotpoint locations, water depths and dates for all eight reflection profiles is given in Table 2. The information given there should be sufficient to permit reprocesssing of the original data, or to merge GLIMPCE seismic profiles with existing geophysical data bases.

CMP DATA PROCESSING

Phase 1 processing of GLIMPCE reflection data was undertaken at the USGS seismic processing center in Denver, Colorado; a detailed description of the original CMP processing sequence is given in Lee and others [6]. Phase 2 processing, migration of the stacked profiles, was completed at the Lithosphere and Canadian Shield Division's seismic processing center in Ottawa.

A brief example of the basic CMP processing sequence leading to stacked seismic sections is listed below.

Processing Sequence

1. Demultiplex
2. Recording gain removal
3. Geometry definition
4. Trace editing
5. Resample to 8 ms
6. F-K filtering in shot domain
4 - 45 Hz, +/- 5 ms/trace
width: 13 traces, length: 31 points
7. CDP sort (24 or 30 fold)
- 8,18 Automatic gain control length: 1000 ms
- 9,11 Velocity analysis
10. Preliminary stack

12. Multiple suppression in CDP domain

correlation velocity: 1700 m/s

application gate: 0- 3000 ms

13. Normal moveout correction

14. First break noise suppression (mute)

15. Pre-stack deconvolution

type: spiking, operator: 59 points

3 windows: 0-4 s, 3-12 s, 10-20 s

16. Stack

24 or 30 fold

17. Bandpass filter

time: 0-2 s, filter: 4/8 - 30/36 Hz

time: 5-8 s, filter: 4/8 - 28/31 Hz

time: 12-20 s, filter: 4/8 - 25/30 Hz

linear interpolation between application windows

19. Post-stack predictive deconvolution

type: 2nd zero crossing, length: 53 points

windows: 0-5 s, 6-20 s

20. Vertical sum (4 to 1)

50 m CMP spacing

21. Automatic gain control

length: 2500 ms

22. Post-stack amplitude smoothing

2-d smoother: 3 traces x 3 samples

23. Display/Output to tape

SEG-Y data format

MIGRATION

Migration is an essential step before seismic data can be used for mapping reliably deep crustal structure. Dipping and curved reflections do not appear at their correct positions in CMP processed sections and diffraction patterns can make interpretation difficult; dipping and curved events are always defocused so that their apparent lengths are frequently overestimated and their apparent dips underestimated [8]. Migration is the process applied to seismic profiles by which these effects are corrected. Hence, structural interpretations of complex deep seismic reflection records should always be based on migrated data.

A frequency-wavenumber (F-K) migration scheme [11] was chosen to migrate the approximately 1350 km of deep crustal GLIMPCE reflection data. The F-K migration algorithm has proven to be exceptionally fast, providing stable results for all dips of interest in the presence of low to moderate noise levels [8]. F-K migration is correct only for constant velocity migration but in practice, smooth time dependent velocity variations and lateral velocity variations can be handled by the algorithm without distorting the seismic image significantly. The uniformly high average crustal velocities (i.e. 6.0 - 6.5 km/s) recorded by GLIMPCE data justify the application of F-K migration.

The following criteria have been used to determine the optimum migration velocities for each of the GLIMPCE reflection profiles: (a) focusing of diffraction patterns, (b) unraveling complex structure, and (c) minimizing migration noise (e.g., smiles). The final migrated sections have been stored in SEG-Y format. Pre-migration processing parameters

(where applicable) and migration velocities used are summarized in Table 1.

Migration Processing Sequence

1. Input stacked section from SEG-Y format tape
see data processing: step 23.
2. Bandpass filter
optional, pre-migration
7/9 - 35/40 Hz
or 14/17 - 35/40 Hz
3. Velocity filter
optional, pre-migration
taper: +/- (3.0 - 3.9) km/s
4. Constant velocity F-K migration tests
velocity interval: 4000 - 8500 m/s
velocity increment: ≤ 250 m/s
5. F-K migration
chosen velocity distribution
6. Display/Output to tape
SEG-Y data format

COHERENCY FILTER AND DISPLAY

“A current stumbling block to the use of deep seismic reflection data by the earth science community is the lack of easy access to conveniently-sized, inexpensive copies of seismic profiles displayed at a standard scale” [10]. For the release of GLIMPCE data we have adopted the COCORP Atlas format, with the following modifications: (a) we present migrated profiles (for reasons outlined above), and (b) we use a different filter for coherency enhancement.

Coherency Enhancement

A semblance-based filter in the time domain has been designed to enhance coherent seismic energy and suppress incoherent background noise. Let the dip passband be defined for slownesses p_j , sampled at J equally spaced steps between p_{min} and p_{max} :

$$p_{min} \leq p_j \leq p_{max}, \quad j \in (1, \dots, J) ,$$

which should cover all apparent dips of the seismic data $u(x,t)$. For a given slowness (dip) p_j , the local multichannel coherency estimate $W(t, p_j; x_c)$ of the wavefield $u(x,t)$ at x_c is defined as [7-9]:

$$W(t, p_j; x_c) = \frac{w(t, p_j; x_c)^2}{L \sum_{l=1}^L u(x_l, t_l)^2}$$

where $w(t, p_j, x_c)$ is the local slant stack of a finite L-trace aperture centered at x_c ,

$$w(t, p_j; x_c) = \sum_{l=1}^L u(x_l, t_l) ,$$

and where $u(x_l, t_l)$ is the seismic data at distance x_l and at time t_l :

$$t_l = t + p_j(x_l - x_c) \quad .$$

For the processing of GLIMPCE data we used a 9-trace aperture ($L=9$) to compute W for each point of the migrated wavefield. The coherency estimate W has values between 0 and 1; the lower bound describing complete incoherency and the upper bound indicating identical amplitudes $u(x, t)$ on all L traces across the aperture, associated with a coherent wavefront of slowness (dip) p_j . The coherency filter $C(x, t)$ for each point of the wavefield is defined as:

$$C(x, t) = \max(W(t, p_j; x))_j, \quad j \in (1, \dots, J) \quad .$$

The coherency enhanced data $U(x, t)$ are given by

$$U(x, t) = u(x, t)C(x, t)^y + d \quad ,$$

where y and d are scaling factors for display only.* It is worth emphasising that the enhanced data $U(x, t)$ are weighted versions of the input data $u(x, t)$ and no data mixing or **smearing** is involved.

* For GLIMPCE data $y=1.5$ and $d=900$ have been used; the choice of y depends on the signal-to-noise ratio of the original data and the anticipated degree of enhancement of coherent seismic energy. Typical values for y are: $0.5 \leq y \leq 2.0$. The scaling factor d applies a dc-shift to the seismic data and improves the readability of variable area displays; the value of d is plotting software dependent.

Display Sequence

1. Input migrated section from SEG-Y format tape
see migration processing: step 6.
2. Vertical sum (2 to 1)
100 m trace spacing
3. Compute coherency filter
dip passband: +/- 3.0 km/s
4. Apply coherency filter
5. Display 16 s coherency enhanced data
vertical scale: 0.6 in/s
horizontal scale: 50 traces/in

Coherency enhanced migrated GLIMPCE reflection profiles are shown in the Appendix. Assuming an average crustal velocity of 6 km/s, these seismic profiles show no vertical exaggeration and the horizontal scale is approx. 1:200000. General survey information, profile direction, line intersections and shot point locations (see Table 2) are annotated.

SUMMARY

Results of phase 2 processing of the 1986 GLIMPCE seismic reflection data have been presented in this report. The approximately 1350 km of migrated data have been displayed in a format that allows interested parties:

- (a) to interpret the data independently,
- (b) to compare results with reflection data being released elsewhere,
- (c) to utilize compiled information for reprocessing the data, and
- (d) to merge results obtained from GLIMPCE data with other geophysical and geological data bases.

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TABLE 1

MIGRATION VELOCITIES

In this section we document pre-migration processing steps (where applicable) and migration velocities as applied to GLIMPCE sections shown in the Appendix. Migration velocities used represent the “best smooth velocity model” for each of the profiles. * Velocity functions for the F-K migration (see listing below) have been linearly interpolated and smoothed.

Lake Superior

Profile A	length: 211.0 km time: 0, 20 s velocity: 5750, 6250 m/s
Profile B	length: 99.1 km time: 0, 20 s velocity: 5750, 6250 m/s
Profile C	length: 112.7 km time: 0, 3.5, 6.0, 9.0, 20 s velocity: 4500, 5000, 5750, 6000, 6250 m/s

* Migration of **local** targets may require the use of slightly different velocity models.

Profile F length: 161.5 km
time: 0, 3.5, 6.0, 8.0, 20 s
velocity: 4500, 5000, 5500, 5750, 6250 m/s

Profile G length: 55.7 km
time: 0, 20 s
velocity: 5750, 6500 m/s

LakeMichigan

Profile H length: 284.9 km
time: 0, 20 s
velocity: 5750, 6250 m/s

LakeHuron

Profile I length: 109.1 km
pre-migration processing 1 s agc
bandpass 7/9 - 35/40 Hz
velocity filter (taper): +/- (3.0-3.9 km/s)
migration time: 0, 20 s
velocity: 5750, 6250 m/s

Profile J length: 306.0 km
pre-migration processing: 1 s agc
bandpass 7/9 - 35/40 Hz
velocity filter (taper): +/- (3.0-3.9 km/s)
migration time: 0, 20 s
velocity: 5750, 6250 m/s

TABLE 2

SURVEY INFORMATION DATA SUMMARY

1986 GLIMPCE Reflection Survey

In this section we document survey dates, shotpoint locations (in UTM coordinates and latitudes and longitudes), and associated water depths (m) for each of the eight GLIMPCE profiles. Survey data for start position, end position and every 50-th shotpoint (approximately 2500 or 3125 m) have been listed. A complete list of information for all shot points has been archived at the GSC and USGS.

Shot information for LINE A

Paramètres de tir pour le PROFIL A

Begin date and time (UT)/Date et heure (TU) du début: 09-09-86/0950

End date and time (UT)/Date et heure (TU) de la fin: 10-09-86/1428

Shot Nu. No. tir	UTM - Zone 16 East North Est Nord	Latitude N Latitude N	Longitude W Longitude O	Water depth Prof. eau m	
101	448794	5191245	46 52 29.0	87 40 19.0	34
151	449376	5193695	46 53 48.6	87 39 52.5	43
201	449870	5196178	46 55 9.1	87 39 30.2	80
251	450367	5198653	46 56 29.4	87 39 7.6	115
301	450850	5201142	46 57 50.2	87 38 45.8	121
351	451393	5203626	46 59 10.8	87 38 21.0	120
401	451998	5206088	47 0 30.7	87 37 53.3	104
451	452508	5208568	47 1 51.2	87 37 30.1	97
501	452954	5211069	47 3 12.3	87 37 9.9	111
551	453451	5213490	47 4 30.9	87 36 47.3	122
601	453920	5215962	47 5 51.1	87 36 25.9	121
651	454429	5218400	47 7 10.2	87 36 2.7	127
701	454934	5220680	47 8 24.2	87 35 39.5	119
751	455333	5223136	47 9 43.8	87 35 21.5	124
801	455833	5225568	47 11 2.7	87 34 58.6	119
851	456438	5227955	47 12 20.2	87 34 30.7	122
901	456994	5230375	47 13 38.7	87 34 5.1	109
951	457429	5232830	47 14 58.3	87 33 45.2	130
1001	457992	5235263	47 16 17.3	87 33 19.3	143
1051	458470	5237700	47 17 36.3	87 32 57.4	141
1101	458943	5240140	47 18 55.5	87 32 35.6	145
1151	459547	5242510	47 20 12.4	87 32 7.7	140
1201	459987	5244905	47 21 30.0	87 31 47.5	141
1251	460553	5247318	47 22 48.3	87 31 21.3	152
1301	461073	5249770	47 24 7.9	87 30 57.2	139
1351	461545	5252236	47 25 27.9	87 30 35.5	123
1401	461975	5254658	47 26 46.4	87 30 15.7	134
1451	462424	5257054	47 28 4.1	87 29 55.0	150
1501	462863	5259467	47 29 22.4	87 29 34.8	157
1551	463399	5261966	47 30 43.4	87 29 9.9	151
1601	463919	5264401	47 32 2.4	87 28 45.8	159
1651	464477	5266799	47 33 20.2	87 28 19.8	158
1701	464971	5269264	47 34 40.1	87 27 56.8	155
1751	465479	5271700	47 35 59.1	87 27 33.2	152
1801	465974	5274144	47 37 18.4	87 27 10.2	150
1851	466444	5276602	47 38 38.1	87 26 48.3	154
1901	466979	5279113	47 39 59.5	87 26 23.4	170
1951	467473	5281562	47 41 18.9	87 26 0.4	159
2001	467962	5284009	47 42 38.3	87 25 37.6	159
2051	468445	5286515	47 43 59.5	87 25 15.0	165
2101	468929	5288973	47 45 19.2	87 24 52.4	143
2151	469396	5291418	47 46 38.5	87 24 30.6	137
2201	469904	5293840	47 47 57.0	87 24 6.8	120
2251	470424	5296214	47 49 14.0	87 23 42.4	131
2301	471074	5298791	47 50 37.6	87 23 11.8	132
2351	471700	5301837	47 52 16.4	87 22 42.3	133

Shot information for LINE A

Paramètres de tir pour le PROFIL A

Begin date and time (UT)/Date et heure (TU) du début: 09-09-86/0950

End date and time (UT)/Date et heure (TU) de la fin: 10-09-86/1428

Shot Nu. No. tir	UTM - Zone 16 East Est	North Nord	Latitude N Latitude N	Longitude W Longitude O	Water depth Prof. eau m
2401	472324	5304883	47 53 55.1	87 22 13.0	160
2451	472948	5307969	47 55 35.2	87 21 43.7	188
2501	473571	5311228	47 57 20.8	87 21 14.4	220
2551	474169	5314319	47 59 1.0	87 20 46.2	229
2601	474886	5317340	48 0 39.0	87 20 12.2	250
2651	475540	5320456	48 2 20.0	87 19 41.3	231
2701	476213	5323611	48 4 2.3	87 19 9.4	269
2751	476895	5326819	48 5 46.3	87 18 37.1	282
2801	477576	5329984	48 7 28.9	87 18 4.8	226
2851	478165	5333091	48 9 9.6	87 17 36.9	214
2901	478839	5336090	48 10 46.8	87 17 4.8	225
2951	479407	5339092	48 12 24.1	87 16 37.8	232
3001	480047	5342177	48 14 4.1	87 16 7.3	233
3051	480666	5345226	48 15 42.9	87 15 37.8	241
3101	481288	5348293	48 17 22.3	87 15 8.1	254
3151	481975	5351339	48 19 1.0	87 14 35.3	225
3201	482614	5354424	48 20 41.0	87 14 4.7	214
3251	483250	5357509	48 22 21.0	87 13 34.2	203
3301	483849	5360556	48 23 59.7	87 13 5.5	196
3351	484520	5363664	48 25 40.4	87 12 33.3	156
3401	485158	5366744	48 27 20.2	87 12 2.7	165
3451	485770	5369842	48 29 0.6	87 11 33.2	122
3501	486406	5372869	48 30 38.7	87 11 2.6	113
3551	487047	5375917	48 32 17.5	87 10 31.7	139
3601	487696	5378892	48 33 53.9	87 10 0.4	138
3651	488289	5381897	48 35 31.2	87 9 31.7	188
3701	488889	5384926	48 37 9.4	87 9 2.7	114
3751	489580	5388064	48 38 51.1	87 8 29.3	221
3801	490319	5391341	48 40 37.2	87 7 53.4	164
3851	490915	5394374	48 42 15.5	87 7 24.5	119
3901	491552	5397412	48 43 53.9	87 6 53.6	141
3944	492190	5400068	48 45 20.0	87 6 22.5	75

Shot information for LINE B

Paramètres de tir pour le PROFIL B

Begin date and time (UT)/Date et heure (TU) du début: 06-09-86/1345

End date and time (UT)/Date et heure (TU) de la fin: 07-09-86/0216

Shot Nu. No. tir	UTM - Zone 16 East Est	North Nord	Latitude N Latitude N	Longitude W Longitude O	Water depth Prof. eau m
111	533966	5385078	48 37 11.3	86 32 20.9	118
161	534945	5382783	48 35 56.8	86 31 33.8	87
211	535925	5380489	48 34 42.3	86 30 46.6	81
261	536886	5378205	48 33 28.2	86 30 0.5	85
311	537869	5375932	48 32 14.3	86 29 13.2	102
361	538840	5373648	48 31 0.2	86 28 26.7	104
411	539795	5371357	48 29 45.7	86 27 40.9	136
461	540779	5369090	48 28 32.1	86 26 53.7	145
511	541704	5366731	48 27 15.5	86 26 9.5	167
561	542663	5364374	48 25 58.9	86 25 23.7	222
611	543738	5362133	48 24 46.1	86 24 32.2	217
661	544736	5359876	48 23 32.7	86 23 44.6	214
711	545709	5357216	48 22 6.3	86 22 58.3	203
761	546750	5354792	48 20 47.6	86 22 8.7	205
811	547799	5352431	48 19 30.8	86 21 18.7	190
861	548799	5350000	48 18 11.8	86 20 31.1	187
911	549857	5347682	48 16 56.4	86 19 40.7	156
961	550873	5345350	48 15 40.6	86 18 52.5	165
1011	551913	5342980	48 14 23.6	86 18 3.1	148
1061	552899	5340559	48 13 4.9	86 17 16.3	150
1111	553856	5338305	48 11 51.6	86 16 31.0	126
1161	554860	5336028	48 10 37.5	86 15 43.4	127
1211	555828	5333754	48 9 23.6	86 14 57.6	122
1261	556842	5331491	48 8 10.0	86 14 9.6	149
1311	557764	5329153	48 6 53.9	86 13 26.2	174
1361	558839	5326881	48 5 40.0	86 12 35.3	209
1411	559739	5324482	48 4 22.0	86 11 53.0	190
1461	560727	5322178	48 3 7.1	86 11 6.4	151
1511	561710	5319872	48 1 52.0	86 10 20.2	148
1561	562702	5317548	48 0 36.4	86 9 33.5	151
1611	563705	5315259	47 59 21.9	86 8 46.3	132
1661	564750	5312906	47 58 5.3	86 7 57.2	167
1711	565727	5310528	47 56 48.0	86 7 11.4	160
1761	566656	5308224	47 55 33.0	86 6 27.9	143
1811	567619	5305862	47 54 16.1	86 5 42.8	131
1861	568628	5303524	47 53 0.0	86 4 55.5	161
1911	569601	5301212	47 51 44.8	86 4 10.0	167
1961	570548	5298912	47 50 29.9	86 3 25.8	172
2011	571695	5296503	47 49 11.4	86 2 32.1	226
2061	573015	5294114	47 47 53.5	86 1 30.0	172
2063	573037	5294033	47 47 50.9	86 1 29.0	173

Shot information for LINE C

Paramètres de tir pour le PROFIL C

Begin date and time (UT)/Date et heure (TU) du début: 12-09-86/1320

End date and time (UT)/Date et heure (TU) de la fin: 13-09-86/0609

Shot Nu. No. tir	UTM - Zone 16 East Est	North Nord	Latitude N Latitude N	Longitude W Longitude O	Water depth Prof. eau m
156	275245	5295026	47 46 16.8	89 59 59.3	217
206	276531	5292043	47 44 41.9	89 58 52.0	190
256	277821	5289132	47 43 9.4	89 57 44.8	176
306	279002	5286190	47 41 35.7	89 56 42.8	172
356	280261	5283320	47 40 4.4	89 55 37.3	178
406	281490	5280406	47 38 31.6	89 54 33.2	176
456	282742	5277513	47 36 59.5	89 53 28.1	181
506	283987	5274578	47 35 26.1	89 52 23.4	175
556	285254	5271687	47 33 54.0	89 51 17.7	175
606	286481	5268802	47 32 22.2	89 50 14.0	175
656	287762	5265966	47 30 51.9	89 49 7.9	176
706	289053	5263081	47 29 20.1	89 48 1.2	164
756	290468	5260252	47 27 50.2	89 46 48.9	164
806	291670	5257354	47 26 17.8	89 45 46.6	177
856	292846	5254439	47 24 44.9	89 44 45.6	192
906	294171	5251616	47 23 15.0	89 43 37.7	193
956	295383	5248776	47 21 44.5	89 42 35.3	203
1006	296533	5245838	47 20 10.7	89 41 35.7	206
1056	297704	5242929	47 18 37.9	89 40 35.2	207
1106	298980	5240096	47 17 7.6	89 39 29.9	206
1156	300310	5237230	47 15 36.4	89 38 22.0	211
1206	301654	5234374	47 14 5.4	89 37 13.6	207
1256	302993	5231511	47 12 34.2	89 36 5.4	208
1306	304187	5228614	47 11 1.7	89 35 4.2	208
1356	305432	5225728	47 9 29.7	89 34 0.6	192
1406	306751	5222834	47 7 57.4	89 32 53.5	191
1456	308024	5219961	47 6 25.8	89 31 48.7	188
1506	309256	5217024	47 4 52.0	89 30 45.8	177
1556	310503	5214082	47 3 18.1	89 29 42.3	160
1606	311761	5211187	47 1 45.7	89 28 38.4	135
1656	312961	5208078	47 0 6.3	89 27 37.0	113
1706	314200	5205158	46 58 33.0	89 26 34.1	106
1756	315468	5202306	46 57 2.0	89 25 29.9	84
1806	316747	5199495	46 55 32.3	89 24 25.4	62
1856	318007	5196668	46 54 2.0	89 23 21.8	36
1880	318643	5195353	46 53 20.1	89 22 49.9	24

Shot information for LINE F

Paramètres de tir pour le PROFIL F

Begin date and time (UT)/Date et heure (TU) du début: 07-09-86/1732

End date and time (UT)/Date et heure (TU) de la fin: 08-09-86/1541

Shot Nu. No. tir	UTM - Zone 16 East North Est Nord	Latitude N Latitude N	Longitude W Longitude O	Water depth Prof. eau m	
101	572472	5295310	47 48 32.5	86 1 55.4	211
151	571859	5292863	47 47 13.5	86 2 26.4	194
201	571230	5290481	47 45 56.6	86 2 58.0	176
251	570425	5288186	47 44 42.6	86 3 38.0	188
301	569752	5285815	47 43 26.1	86 4 11.7	145
351	569191	5283412	47 42 8.5	86 4 40.0	109
401	568502	5281055	47 40 52.4	86 5 14.4	108
451	567770	5278703	47 39 36.5	86 5 50.8	131
502	566552	5273714	47 36 55.4	86 6 51.9	141
552	565825	5270717	47 35 18.6	86 7 28.3	288
602	565162	5267611	47 33 38.2	86 8 1.7	194
652	564274	5264693	47 32 4.0	86 8 45.8	114
702	563525	5261683	47 30 26.8	86 9 23.2	112
752	562715	5258652	47 28 48.9	86 10 3.4	162
802	561804	5255525	47 27 7.9	86 10 48.5	259
852	560964	5252418	47 25 27.6	86 11 30.2	253
902	560394	5249889	47 24 5.8	86 11 58.6	272
952	559791	5246829	47 22 26.9	86 12 28.9	188
1002	559036	5243859	47 20 51.0	86 13 6.3	139
1052	558246	5240866	47 19 14.3	86 13 45.4	138
1102	557471	5237890	47 17 38.1	86 14 23.7	125
1152	556697	5234910	47 16 1.9	86 15 1.9	174
1202	556032	5231843	47 14 22.7	86 15 34.9	343
1252	555260	5228859	47 12 46.3	86 16 12.9	331
1302	554520	5225878	47 11 10.0	86 16 49.4	149
1352	553779	5222896	47 9 33.6	86 17 25.9	175
1402	553038	5219915	47 7 57.2	86 18 2.4	172
1452	552260	5216929	47 6 20.7	86 18 40.5	173
1502	551497	5213919	47 4 43.5	86 19 18.0	171
1552	550717	5210902	47 3 5.9	86 19 56.2	193
1602	549822	5210585	47 2 55.9	86 20 38.7	207
1652	547502	5209727	47 2 28.7	86 22 29.0	208
1702	545240	5208706	47 1 56.2	86 24 16.6	320
1752	542890	5207695	47 1 24.0	86 26 8.2	345
1802	540376	5206723	47 0 53.1	86 28 7.6	287
1852	537914	5205691	47 0 20.2	86 30 4.6	333
1902	535397	5204615	46 59 45.9	86 32 4.0	209
1952	533195	5203819	46 59 20.5	86 33 48.5	182
2002	530862	5202974	46 58 53.5	86 35 39.2	256
2052	528565	5202001	46 58 22.4	86 37 28.1	358
2102	526142	5200990	46 57 50.0	86 39 23.0	252
2152	523248	5199753	46 57 10.3	86 41 40.2	309
2202	520295	5198547	46 56 31.6	86 44 0.1	255
2252	517398	5197482	46 55 57.4	86 46 17.2	247
2302	514481	5196346	46 55 20.8	86 48 35.3	209
2352	511550	5195274	46 54 46.3	86 50 54.0	222

Shot information for LINE F

Paramètres de tir pour le PROFIL F

Begin date and time (UT)/Date et heure (TU) du début: 07-09-86/1732

End date and time (UT)/Date et heure (TU) de la fin: 08-09-86/1541

Shot Nu. No. tir	UTM - Zone 16 East North Est Nord	Latitude N Latitude N	Longitude W Longitude O	Water depth Prof. eau m
2402	508690 5194043	46 54 6.6	86 53 9.3	187
2452	505772 5192855	46 53 28.2	86 55 27.3	178
2502	502855 5191623	46 52 48.4	86 57 45.1	161
2552	499917 5190447	46 52 10.3	87 0 3.9	193
2602	497049 5189399	46 51 36.3	87 2 19.4	160
2652	494210 5188150	46 50 55.8	87 4 33.4	141
2702	491360 5186988	46 50 18.0	87 6 47.9	165
2752	488480 5185818	46 49 40.0	87 9 3.8	169
2802	485657 5184606	46 49 0.5	87 11 16.9	144
2843	483276 5183709	46 48 31.2	87 13 9.1	150

Shot information for LINE G

Paramètres de tir pour le PROFIL G

Begin date and time (UT)/Date et heure (TU) du début: 11-09-86/0312

End date and time (UT)/Date et heure (TU) de la fin: 11-09-86/0849

Shot Nu. No. tir	UTM - Zone 16 East Est	North Nord	Latitude N Latitude N	Longitude W Longitude O	Water depth Prof. eau m
101	517032	5332867	48 9 2.8	86 46 15.7	185
151	514348	5334450	48 9 54.4	86 48 25.4	146
201	511692	5336126	48 10 48.8	86 50 33.8	156
251	509175	5337761	48 11 41.9	86 52 35.6	190
301	506415	5339402	48 12 35.2	86 54 49.2	313
351	503734	5341014	48 13 27.5	86 56 59.0	287
401	501018	5342616	48 14 19.4	86 59 10.7	223
451	498375	5344223	48 15 11.5	87 1 18.8	212
501	495772	5345969	48 16 8.0	87 3 25.1	186
551	493134	5347643	48 17 2.1	87 5 33.2	177
601	490483	5349343	48 17 57.0	87 7 42.0	180
651	487829	5351022	48 18 51.3	87 9 51.0	206
701	485097	5352657	48 19 44.0	87 12 3.8	237
751	482366	5354331	48 20 38.0	87 14 16.7	216
801	479607	5355942	48 21 29.8	87 16 31.0	204
851	476865	5357633	48 22 24.3	87 18 44.6	181
901	474177	5359141	48 23 12.7	87 20 55.6	192
951	471418	5360831	48 24 7.0	87 23 10.2	175
969	470458	5361427	48 24 26.2	87 23 57.0	161

Shot information for LINE H

Paramètres de tir pour le PROFIL H

Begin date and time (UT)/Date et heure (TU) du début: 18-09-86/1306

End date and time (UT)/Date et heure (TU) de la fin: 19-09-86/1840

Shot Nu. No. tir	UTM - Zone 16 East Est	North Nord	Latitude N Latitude N	Longitude W Longitude O	Water depth Prof. eau m
101	477327	4868058	43 58 2.1	87 16 57.5	104
151	478468	4870923	43 59 35.1	87 16 6.7	107
201	479606	4873786	44 1 8.0	87 15 16.0	124
251	480751	4876626	44 2 40.1	87 14 25.0	143
301	482099	4879607	44 4 16.9	87 13 24.8	157
351	483329	4882476	44 5 50.0	87 12 29.8	165
401	484549	4885330	44 7 22.6	87 11 35.2	174
451	485730	4888210	44 8 56.0	87 10 42.4	174
501	486931	4891090	44 10 29.4	87 9 48.6	171
551	488132	4893968	44 12 2.8	87 8 54.7	182
601	489324	4896853	44 13 36.4	87 8 1.2	203
651	490515	4899726	44 15 9.5	87 7 7.7	211
701	491684	4902602	44 16 42.8	87 6 15.2	235
751	492831	4905495	44 18 16.6	87 5 23.6	243
801	494252	4908290	44 19 47.3	87 4 19.5	255
851	495460	4911169	44 21 20.6	87 3 25.1	249
901	496647	4914064	44 22 54.5	87 2 31.5	256
951	497779	4916937	44 24 27.6	87 1 40.4	242
1001	499009	4919798	44 26 0.3	87 0 44.8	241
1051	500248	4922647	44 27 32.7	86 59 48.8	226
1101	501541	4925532	44 29 6.2	86 58 50.2	237
1151	502865	4928331	44 30 36.9	86 57 50.3	244
1201	504030	4931281	44 32 12.5	86 56 57.4	244
1251	505142	4934133	44 33 44.9	86 56 6.9	250
1301	506377	4936983	44 35 17.2	86 55 10.8	249
1351	507580	4939869	44 36 50.7	86 54 16.1	252
1401	508713	4942762	44 38 24.4	86 53 24.5	250
1451	509971	4945579	44 39 55.6	86 52 27.2	252
1501	511229	4948440	44 41 28.3	86 51 29.9	259
1551	512445	4951328	44 43 1.8	86 50 34.4	262
1601	513635	4954217	44 44 35.4	86 49 40.0	260
1651	514841	4957089	44 46 8.4	86 48 44.9	255
1701	516086	4959949	44 47 40.9	86 47 47.9	253
1751	517267	4962844	44 49 14.7	86 46 53.8	247
1801	518426	4965741	44 50 48.4	86 46 0.6	232
1851	519608	4968634	44 52 22.1	86 45 6.4	219
1901	520822	4971530	44 53 55.8	86 44 10.6	199
1951	522047	4974404	44 55 28.8	86 43 14.3	205
2001	523321	4977243	44 57 0.7	86 42 15.7	209
2051	524520	4980102	44 58 33.2	86 41 20.5	204
2101	525717	4982961	45 0 5.7	86 40 25.4	199
2151	526911	4985854	45 1 39.3	86 39 30.3	196
2201	528179	4988751	45 3 13.0	86 38 31.7	189
2251	529406	4991621	45 4 45.8	86 37 35.0	191
2301	530612	4994488	45 6 18.5	86 36 39.2	198
2351	531833	4997356	45 7 51.3	86 35 42.7	186

Shot information for LINE H

Paramètres de tir pour le PROFIL H

Begin date and time (UT)/Date et heure (TU) du début: 18-09-86/1306

End date and time (UT)/Date et heure (TU) de la fin: 19-09-86/1840

Shot Nu. No. tir	UTM - Zone 16 East North Est Nord	Latitude N Latitude N	Longitude W Longitude O	Water depth Prof. eau m	
2401	533050	5000228	45 9 24.1	86 34 46.3	167
2451	534269	5003103	45 10 57.1	86 33 49.8	164
2501	535490	5005961	45 12 29.5	86 32 53.1	154
2551	536650	5008832	45 14 2.3	86 31 59.2	148
2601	537881	5011715	45 15 35.5	86 31 1.9	137
2651	539085	5014603	45 17 8.9	86 30 5.9	144
2701	540343	5017486	45 18 42.0	86 29 7.3	156
2751	541577	5020356	45 20 14.8	86 28 9.7	166
2801	542788	5023220	45 21 47.3	86 27 13.2	164
2851	543946	5026130	45 23 21.3	86 26 19.0	156
2901	545182	5029005	45 24 54.2	86 25 21.3	161
2951	546413	5031871	45 26 26.8	86 24 23.7	161
3001	547633	5034737	45 27 59.4	86 23 26.5	151
3051	548832	5037614	45 29 32.3	86 22 30.3	145
3101	550057	5040499	45 31 5.5	86 21 32.8	140
3151	551217	5043306	45 32 36.1	86 20 38.2	120
3201	552427	5046182	45 34 9.0	86 19 41.3	109
3251	553641	5049067	45 35 42.1	86 18 44.2	95
3301	554898	5051946	45 37 15.0	86 17 45.0	88
3351	556166	5054821	45 38 47.8	86 16 45.3	86
3401	557377	5057692	45 40 20.5	86 15 48.1	78
3451	558619	5060580	45 41 53.7	86 14 49.5	64
3501	559841	5063468	45 43 26.9	86 13 51.7	51
3551	561070	5066357	45 45 0.1	86 12 53.5	45
3601	563873	5067524	45 45 37.0	86 10 43.2	45
3651	566845	5068438	45 46 5.6	86 8 25.2	64
3701	569807	5069350	45 46 34.1	86 6 7.6	75
3751	572774	5070282	45 47 3.2	86 3 49.8	83
3801	575736	5071219	45 47 32.4	86 1 32.1	89
3851	578784	5072089	45 47 59.4	85 59 10.4	87
3901	581678	5073197	45 48 34.0	85 56 55.7	71
3951	584611	5074118	45 49 2.6	85 54 39.2	72
4001	587606	5075026	45 49 30.7	85 52 19.9	43
4051	590596	5075981	45 50 0.2	85 50 0.7	58
4101	593545	5076942	45 50 29.9	85 47 43.4	38
4151	596543	5077750	45 50 54.6	85 45 23.8	47
4201	599567	5078685	45 51 23.4	85 43 3.0	42
4251	602512	5079703	45 51 54.8	85 40 45.7	36
4301	605488	5080719	45 52 26.1	85 38 26.9	33
4351	608472	5081636	45 52 54.1	85 36 7.8	37
4401	611474	5082712	45 53 27.2	85 33 47.6	25
4451	614536	5083651	45 53 55.8	85 31 24.8	20
4501	617584	5084583	45 54 24.2	85 29 2.6	18
4551	620615	5085524	45 54 52.8	85 26 41.1	21
4601	623490	5086569	45 55 24.8	85 24 26.7	32
4636	625590	5087221	45 55 44.5	85 22 48.7	18

Shot information for LINE I

Paramètres de tir pour le PROFIL I

Begin date and time (UT)/Date et heure (TU) du début: 20-09-86/1943

End date and time (UT)/Date et heure (TU) de la fin: 21-09-86/0701

Shot Nu. No. tir	UTM - Zone 16 East Est	North Nord	Latitude N Latitude N	Longitude W Longitude O	Water depth Prof. eau m
102	794460	5011845	45 12 1.7	83 15 3.3	62
152	794438	5014992	45 13 43.5	83 14 57.6	61
202	794315	5018138	45 15 25.4	83 14 56.6	64
252	794140	5021296	45 17 7.8	83 14 57.8	69
302	794015	5024450	45 18 50.0	83 14 56.8	73
352	793848	5027563	45 20 30.9	83 14 57.8	76
402	793702	5030617	45 22 9.9	83 14 58.0	93
452	793553	5033730	45 23 50.7	83 14 58.2	98
502	793404	5036859	45 25 32.2	83 14 58.3	110
552	793249	5039992	45 27 13.7	83 14 58.7	101
602	793111	5043132	45 28 55.4	83 14 58.3	86
652	792978	5046249	45 30 36.4	83 14 57.7	97
702	792829	5049367	45 32 17.5	83 14 57.9	115
752	792686	5052495	45 33 58.8	83 14 57.7	120
802	792539	5055612	45 35 39.8	83 14 57.8	130
852	792407	5058716	45 37 20.4	83 14 57.1	128
902	792265	5061819	45 39 0.9	83 14 57.0	108
952	792133	5064936	45 40 41.9	83 14 56.3	104
1002	791980	5068046	45 42 22.7	83 14 56.7	90
1052	791832	5071174	45 44 4.1	83 14 56.7	87
1102	791611	5074280	45 45 44.8	83 15 0.2	88
1152	791458	5077393	45 47 25.7	83 15 0.5	65
1202	791318	5080520	45 49 7.1	83 15 0.2	49
1252	791214	5083715	45 50 50.5	83 14 58.0	49
1302	791160	5086922	45 52 34.3	83 14 53.5	71
1352	790997	5090145	45 54 18.7	83 14 54.1	65
1402	790895	5093208	45 55 57.9	83 14 52.1	63
1452	790764	5096098	45 57 31.6	83 14 51.9	55
1502	790613	5099223	45 59 12.8	83 14 52.0	34
1552	790334	5102339	46 0 54.0	83 14 58.2	65
1602	790247	5105424	46 2 33.9	83 14 55.4	59
1652	790093	5108549	46 4 15.2	83 14 55.7	58
1702	789840	5111656	46 5 56.0	83 15 0.7	51
1752	789668	5114719	46 7 35.3	83 15 2.0	45
1802	789564	5117851	46 9 16.7	83 14 59.9	20
1823	789575	5119169	46 9 59.3	83 14 56.5	16

Shot information for LINE J

Paramètres de tir pour le PROFIL J

Begin date and time (UT)/Date et heure (TU) du début: 22-09-86/0649

End date and time (UT)/Date et heure (TU) de la fin: 23-09-86/1631

Shot Nu. No. tir	UTM - Zone 16 East Est	North Nord	Latitude N Latitude N	Longitude W Longitude O	Water depth Prof. eau m
101	1037809	5015599	45 5 27.1	80 9 56.4	58
151	1034619	5016096	45 5 51.8	80 12 19.4	52
201	1031358	5016600	45 6 16.9	80 14 45.7	59
251	1028209	5017159	45 6 43.3	80 17 6.6	70
301	1025094	5017734	45 7 10.2	80 19 26.1	63
351	1022035	5018276	45 7 35.8	80 21 43.1	54
401	1018857	5018871	45 8 3.3	80 24 5.4	54
451	1015757	5019380	45 8 27.9	80 26 24.5	57
501	1012673	5019886	45 8 52.2	80 28 42.9	50
551	1009597	5020383	45 9 16.2	80 31 1.0	69
601	1006506	5020904	45 9 41.0	80 33 19.8	57
651	1003462	5021548	45 10 9.6	80 35 36.0	60
701	1000396	5022136	45 10 36.4	80 37 53.5	61
751	997305	5022664	45 11 1.2	80 40 12.3	64
801	994241	5023193	45 11 26.0	80 42 30.0	66
851	991169	5023720	45 11 50.7	80 44 48.1	58
901	988118	5024247	45 12 15.3	80 47 5.2	88
951	985092	5024812	45 12 41.0	80 49 21.2	95
1001	982056	5025415	45 13 7.9	80 51 37.4	80
1051	979106	5025958	45 13 32.6	80 53 50.0	81
1101	975965	5026497	45 13 57.7	80 56 11.4	82
1151	972853	5027046	45 14 22.9	80 58 31.5	84
1201	969751	5027612	45 14 48.6	81 0 51.0	81
1251	966700	5028189	45 15 14.5	81 3 8.3	98
1301	963665	5028743	45 15 39.6	81 5 24.9	106
1351	960599	5029352	45 16 6.5	81 7 42.8	121
1401	957577	5029907	45 16 31.4	81 9 59.0	136
1451	954541	5030450	45 16 56.0	81 12 15.8	110
1501	951509	5031003	45 17 20.9	81 14 32.4	113
1551	948409	5031513	45 17 44.5	81 16 52.4	117
1601	945261	5031971	45 18 6.4	81 19 14.7	122
1651	942174	5032523	45 18 31.3	81 21 34.0	126
1701	939098	5033056	45 18 55.4	81 23 52.9	134
1751	936014	5033559	45 19 18.5	81 26 12.3	136
1801	932936	5034080	45 19 42.2	81 28 31.4	100
1851	929750	5034296	45 19 56.2	81 30 56.4	65
1901	926623	5033820	45 19 47.7	81 33 20.8	46
1951	923506	5033134	45 19 32.4	81 35 45.5	56
2001	920567	5032541	45 19 19.6	81 38 1.7	22
2051	917487	5032850	45 19 36.2	81 40 21.7	21
2101	914516	5033939	45 20 17.6	81 42 34.3	32
2151	911448	5034794	45 20 51.7	81 44 52.1	75
2201	908363	5035581	45 21 23.6	81 47 10.9	33
2251	905322	5036201	45 21 50.0	81 49 28.3	44
2301	902245	5036636	45 22 10.4	81 51 47.9	40
2351	899292	5037431	45 22 42.1	81 54 0.8	51

Shot information for LINE J

Paramètres de tir pour le PROFIL J

Begin date and time (UT)/Date et heure (TU) du début: 22-09-86/0649

End date and time (UT)/Date et heure (TU) de la fin: 23-09-86/1631

Shot Nu. No. tir	UTM - Zone 16 East Est	North Nord	Latitude N Latitude N	Longitude W Longitude O	Water depth Prof. eau m
2401	896260	5038109	45 23 10.2	81 56 17.7	63
2451	893223	5038921	45 23 42.6	81 58 34.5	57
2501	890162	5039554	45 24 9.2	82 0 52.9	68
2551	887024	5039858	45 24 25.2	82 3 15.9	100
2601	883917	5040187	45 24 42.0	82 5 37.3	105
2651	880808	5040597	45 25 1.4	82 7 58.7	95
2701	877721	5040966	45 25 19.3	82 10 19.2	96
2751	874660	5041303	45 25 36.1	82 12 38.7	106
2801	871507	5041683	45 25 54.4	82 15 2.2	111
2851	868533	5042013	45 26 10.7	82 17 17.7	122
2901	865441	5042387	45 26 28.7	82 19 38.6	119
2951	862318	5042566	45 26 40.3	82 22 1.4	108
3001	859217	5042882	45 26 56.3	82 24 22.8	121
3051	856151	5043227	45 27 13.0	82 26 42.6	129
3101	853042	5043559	45 27 29.5	82 29 4.5	142
3151	849951	5043902	45 27 46.1	82 31 25.5	159
3201	846884	5044308	45 28 4.7	82 33 45.2	131
3251	843848	5044767	45 28 25.0	82 36 3.5	152
3301	840681	5044980	45 28 37.5	82 38 28.4	137
3351	837539	5045268	45 28 52.2	82 40 52.0	166
3401	834407	5045559	45 29 7.1	82 43 15.1	174
3451	831308	5045918	45 29 24.0	82 45 36.6	144
3501	828208	5046216	45 29 38.9	82 47 58.3	134
3551	825109	5046571	45 29 55.6	82 50 19.9	107
3601	822007	5046922	45 30 12.1	82 52 41.6	103
3651	818915	5047271	45 30 28.5	82 55 2.9	80
3701	815756	5047612	45 30 44.7	82 57 27.3	89
3751	812615	5047943	45 31 0.5	82 59 51.0	89
3801	809532	5048309	45 31 17.3	83 2 11.9	93
3851	806464	5048685	45 31 34.3	83 4 32.1	108
3901	803399	5049023	45 31 50.1	83 6 52.4	113
3951	800323	5049346	45 32 5.3	83 9 13.1	121
4001	797203	5049681	45 32 21.0	83 11 35.9	124
4051	794078	5049966	45 32 34.9	83 13 59.1	108
4101	790923	5050298	45 32 50.4	83 16 23.6	112
4151	787797	5050700	45 33 8.1	83 18 46.6	109
4201	784670	5051069	45 33 24.7	83 21 9.7	107
4251	781557	5051415	45 33 40.4	83 23 32.3	129
4301	778444	5051729	45 33 55.1	83 25 55.0	146
4351	775305	5052050	45 34 10.0	83 28 18.9	100
4401	772175	5052393	45 34 25.5	83 30 42.3	98
4451	769059	5052742	45 34 41.1	83 33 5.1	100
4501	766198	5052983	45 34 52.9	83 35 16.4	95
4551	763075	5053308	45 35 7.7	83 37 39.6	94
4601	759956	5053656	45 35 23.2	83 40 2.7	97
4651	756828	5053984	45 35 38.0	83 42 26.2	96

Shot information for LINE J

Paramètres de tir pour le PROFIL J

Begin date and time (UT)/Date et heure (TU) du début: 22-09-86/0649

End date and time (UT)/Date et heure (TU) de la fin: 23-09-86/1631

Shot Nu. No. tir	UTM - Zone 16 East Est	North Nord	Latitude N Latitude N	Longitude W Longitude O	Water depth Prof. eau m
4701	753706	5054345	45 35 53.8	83 44 49.3	86
4751	750608	5054665	45 36 8.2	83 47 11.5	90
4801	747504	5055023	45 36 23.7	83 49 33.9	86
4851	744422	5055442	45 36 41.2	83 51 55.2	86
4901	741310	5055754	45 36 55.2	83 54 18.2	80
4951	738200	5056066	45 37 9.2	83 56 41.0	74
5001	735097	5056418	45 37 24.4	83 59 3.5	69
5051	732010	5056747	45 37 38.8	84 1 25.3	68
5101	728941	5057078	45 37 53.2	84 3 46.2	54
5151	725845	5057313	45 38 4.4	84 6 8.7	49
5201	722780	5057718	45 38 21.1	84 8 29.4	40
5251	719701	5058029	45 38 34.7	84 10 50.9	24
5264	718898	5058123	45 38 38.6	84 11 27.8	24

APPENDIX

MIGRATED CRUSTAL SECTIONS

Number of Plates : 10

GLIMPCE profiles H (Lake Michigan) and J (Lake Huron)* have been plotted on two separate plates (Part 1 and Part 2). Each of the remaining profiles (A,B,C,F,G and I) has been plotted on a single plate. The start and end locations of each profile are listed. Further control points have been specified for bending profiles (i.e. F,H).

* Note: the westernmost 5 km of Profile J data are not displayed