U.S. Geological Survey
Woods Hole, MA 02543

August 6, 1991

MEMORANDUM

To: The Record - Foreign Trip Reports

From: Kim D. Klitgord
Atlantic Marine Geology Branch

Subject: Trip to Moscow USSR and Irkutsk, Siberia USSR
US-USSR Cooperative Research Geological Field Work at Lake Baikal

During the period June 16th to July 27th, I participated in a U.S.-USSR cooperative field program at Lake Baikal, Siberia USSR. This field work was part of a U.S.-Soviet cooperative study of the neotectonic evolution of the Baikal Rift and the geologic framework for paleoclimatic studies at Lake Baikal, supported jointly by the U.S. Geological Survey, the U.S. National Science Foundation, and the USSR Academy of Sciences. The primary purpose of this field program was to establish a viable land-based cooperative effort to link with the extensive marine cooperative project already underway. The U.S. geologist in charge of these initial field operations was Prof. Susan M. Agar, Department of Geological Sciences, Northwestern University, Evanston IL. The lead Soviet researcher for this part of the cooperative is Dr. Kiril Levi, Institute of the Earth's Crust, USSR Academy of Sciences, Irkutsk, USSR. The Soviet field team included four geologists in his research group plus a transport driver and an interpreter. In addition, we were joined in the field by Prof. Victor Mats, Irkutsk Polytechnic Institute, who is the leading expert on Cenozoic geology of the Ol'khon region. In Moscow we met with Prof. V. S. Fedorovskiy, Institute of Geology USSR Academy of Sciences, leading Soviet expert on the basement geology of the Ol'khon region.

The geologic field program was focused on the central Lake Baikal region and included 9 days of reconnaissance of coastal outcrops in the Ol'khon-Barguzin-Svyatoy Nos Peninsula areas (Figure 1) aboard the fishing vessel T/x Treskov and 17 days onshore in the Ol'khon Peninsula and Ol'khon Island region. We were in Irkutsk on June 19-21 for final planning and logistics preparation, aboard the T/x Treskov from June 22nd to June 30th, conducting geologic field mapping in the Ol'khon area from July 1st to July 17th, in Irkutsk from July 18th to 20th for initial progress evaluation, report writing, and 1992 field planning, and in Moscow from July 24th to 25th obtaining additional geologic information for Baikal from researchers at the Vernadsky Institute of Geochemistry and at the Institute of Geology of the USSR Academy of Sciences. A summary schedule and location of field stops is given in Table 1 and the general areas are shown in Figure 1.

**Coastal Reconnaissance Work**

The primary purpose of the work using the T/x Treskov was to enable us to examine rock outcrops and geologic structures along the coast of Ol'khon Peninsula, Ol'khon Island, Svyatoy Nos Peninsula, Ushkanji Island, and the Barguzin Range (Figure 1) that would not be readily accessible by land transport. This was the only opportunity to examine any of the features on the east side of the lake because of restrictions related to permits (Buriat is a separate republic), limited availability of geologic maps and information to our hosts, and logistics transportation support. We made an initial stop at Ust Barguzin for permits and then 18 stops along the coast of the east side of the lake to examine geologic features related to pre-Cenozoic basement and Cenozoic neotectonic activity. These stops are indicated in Table 1, and the general area is shown in Figure 2. On the west side of the lake we made 8 stops on the east coast of Ol'khon Peninsula and Ol'khon Island, two stops along the Primorskii Fault coast west of Ol'khon Island, and viewed from the boat the entire Ol'khon region coast from Bugul'deika (south tip of Ol'khon Peninsula), around Ol'khon Island, and up the Primorskii Range coast to Onguren. The stops were in areas we could not access by vehicle, and we used the offshore transits to identify places to which we would return when undertaking the land field work.

## Onshore Field Studies

The onshore field studies were limited to the Ol'khon region (Figures 3 and 4) on the west side of Lake Baikal. The large size and diverse interests of the field group made it more productive to divide into three field teams, two Soviet and one U.S., based out of a main camp at Mykhur Sound. The plans and initial results from the field studies of these teams were discussed at the base camp, which enabled US and Soviet scientists to observe each others' field techniques without duplicating efforts. Transport to the field areas was via a large field truck and a small motor boat, necessitated by the poor road conditions over much of the region. Three long trips were made away from the main field camp. One trip was made northward along the Primorskii Fault to the Zama area (4 days), one trip was made over to Ol'khon Island (3 days), and one trip was made south to Bugul'deika (3 days).

Land studies by Dr. Agar and myself were focused in seven areas (Figures 3 and 4). Along the Primorskii Fault, we examined Bugul-deika graben (southern end of Ol'khon Peninsula), the Mykhur graben (north end of Ol'khon Peninsula), Sarma delta and valley (southern end of Primorskii Fault adjacent to Maloye More Bay), and Zama delta (north end of Primorskii Fault adjacent to Maloye More Bay). We examined a series of ponds and related basement structures in central Ol'khon Peninsula (just north of the Anga River), which we had identified on LANDSAT images as potential recent tectonic features. This is the region of extensive basement mapping by Prof. Fedorovskiy and colleagues at the Institute of Geology. Prof. Mats spent three days with us examining Cenozoic sedimentary units along the west coast of Ol'khon Island, potential primary records of neotectonic activity. Finally we investigated the northeast coast of Ol'khon Island, the location of the onshore continuation of structural features identified with marine seismic studies over Academician Ridge. We conducted initial structural mapping, sampling, photo mosaicing in each of these 7 areas with the objective of identifying the most productive techniques and regions of investigation for examining neotectonic evolution of the rift system. Locations of these study areas are listed in Table 1 and the general locations are shown on Figures 3 and 4).

The Soviets focused their efforts on the basement-rock exposures in valleys that cut the major border faults. They examined fault structures and fractures in the footwall of the Primorskii Fault at Bugul'deika Valley, Anga Valley, Sarma Valley, and the main scarp wall just north of Zama delta. On Ol'khon Island they examined similar structures in the valley that cuts the Morskii Fault (eastern edge of Ol'khon Island) at Khaga-Yeman on the northeast coast. They used the small motor boat to investigate the islands around Ol'khon gate, the ancient river valley that now separates Ol'khon Peninsula from Ol'khon Island. Primary objective of these studies was to map fault and fracture patterns for evidence of reactivated structural control on neotectonic deformation.

## Summary

This summer's land field work demonstrated that a variety of land-based geologic and geophysical studies were both viable and likely to yield extensive scientific results. We identified 4 locations where onshore-offshore studies can be successfully undertaken: 1. northeast coast of Ol'khon Island and Academician Ridge; 2. Bugul'deika graben and the offshore intersection of the Primorskii and Morskii Faults and juncture between the southern and central basins of Lake Baikal; 3. Mykhur graben, Sarma Delta, and Ol'khon Gate; and 4. Zama delta where the Primorskii fault goes offshore into the northern basin of Lake Baikal. In addition, the studies of sedimentary units and structures along the west coast of Ol'khon Island would complement all of the proposed seismic stratigraphic and coring studies planned for offshore.

Primary limitations to any land program are the logistics for transport, fuel and food, the vast array of permits required to work in the region, and limited access for Soviet scientists (and foreign scientists) to general base-level geologic information in the area. These latter items include detailed topographic charts and aerophotographs which are still classified and detailed geologic reports by the Ministry of Geology which have limited access and distribution. In addition, significant amounts of geologic information collected by researchers at various institutes of the USSR Academy of Sciences have never been published or released. Therefore it is important to expand the field of cooperating Soviet scientists to organizations not directly involved with the Baikal International Research Center, because this group of scientists represent only a small part of Soviet researchers in the Baikal region. The problem of limited logistics support for transportation and food can be

partially remedied if we recognize up front that U.S. scientists will have to provide some of their own support within the Soviet Union. This should include the rental of vehicles at Baikal and bringing our own food. We have already initiated requests for alternate transportation for next year. The required permits will continue to be a problem, and we have tried to get the Soviets to itemize for us all required permits before hand so we would know what is or is not possible. Several of our planned studies could not be carried out because of the lack of permits or restrictions to enter certain areas. Some of these restrictions could have been overcome with more advanced planning but it was too late while in the field.

An initial report was prepared in Irkutsk summarizing our field work and indicating planned studies for a continuation of this part of the cooperative next summer. This planned work will focus on the seven areas we investigated this year, with a more restricted plan to be developed next winter after initial analyses have been completed on rock samples acquired during this field season. All rock samples acquired by us will be analyzed at Northwestern University, and we have offered to undertake selected analyses of samples collected by our Soviet colleagues (to be proposed by them after they have completed some initial studies). The possibility of some Soviet scientists coming to the U.S. as part of this cooperative was included in the report, but it was clearly stated that any such visit would be directly related to the scientific objectives of this project, the neotectonic evolution of the central Baikal rift, and focused on data analyses and interpretation of data from our joint studies. Exchange visits for field work in the U.S. were not within the scope or funding level of this project. We emphasize to our Soviet colleagues that funding in the U.S. for these projects was on an individual level, and that there was no blanket support from NSF or USGS for the U.S. side of a collaborative study.

# TABLE 1

U.S.-Soviet cooperative research at Lake Baikal
June 21st to July 17th 1991 geologic field work in the central Lake Baikal Region
Ol'khon Peninsula, Ol'khon Island, Svyatoy Nos Peninsula, Ushkanji Island, and Barguzin coast.
GPS positions for coastal reconnaissance sites and geologic field work sites.
Dr. Susan M. Agar, Department of Geological Sciences, Northwestern University, Evanston IL USA
Dr. Kim D. Klitgord, U.S. Geological Survey, Woods Hole, MA USA
Dr. Kiril Levi, Institute of the Earth's Crust, Irkutsk, Siberia, USSR

Reconnaissance of central Lake Baikal aboard T/x Treskov

| ID | Date | Time | Latitude | Longitude | Location |
|---|---|---|---|---|---|
| LYS | 21June91 | 1021h | 51d50.62'n | 104d52.64'e | Listvyanka - port of departure along west shore |
| LB | 22June91 | 0800h | 51d55.0'n | 105d13.0'e | Bolshoi Kotu - SW dipping plane in Jurassic |
| LB | 22June91 | 0900h | 52d01.0'n | 105d27.0'e | Goloustnaya Delta - uplifting delta |
| LB | 22June91 | 1100h | 52d05.5n | 105d33.0'e | Yelotka Valley - photo mosaic |
| LB | 22June91 | 1230h | 52d14.0'n | 105d40.0'e | Alluvial Fans |
| OL1 | 22June91 | 1530h | 52d30.42'n | 105d59.31'e | Bugul'deika - Primorskii Fault |
| OL2 | 22June91 | 2000h | 53d01.0'n | 106d53.0'e | Ol'khon Peninsula - MRS |
| OL3-C | 22June91 | 2100h | 53d01.94'n | 106d45.11'e | Ol'khon Peninsula - Mykhur Camp |
| OL4 | 23June91 | 0830h | 53d00.2'n | 106d58.4'e | Ol'khon Island - Morskii Fault - SW tip |
| OL5 | 23June91 | 0930h | 53d00.4'n | 106d58.8'e | Ol'khon Island - Morskii Fault - SW tip |
| OL6A | 23June91 | 1125h | 53d03.40'n | 107d13.45'e | Ol'khon Island - Morskii Fault -Ithuba Valley |
| OL6 | 23June91 | 1200h | 53d04.12'n | 107d19.26'e | Ol'khon Island - Morskii Fault - valley |
| OL7 | 23June91 | 1330h | 53d04.84'n | 107d24.70'e | Ol'khon Island - Cape Ukhan - uplifted fan |
| OL7A | 23June91 | 1530h | 53d05.57'n | 107d26.03'e | Ol'khon Island - Cape Ukhan - uplifted fan |
| OL8 | 23June91 | 1715h | 53d13.20'n | 107d39.40'e | Ol'khon Island - just west of Cape Ishimey |
| UB-C | 24June91 | 0800h | 53d25.36'n | 109d00.69'e | Ust Barguzin - stop for permits |
| SN | 24June91 | 1304h | 53d34.70'n | 108d49.12'e | Svyatoy Nos Peninsula - Offshore SE coast |
| SN | 24June91 | 1341h | 53d32.82'n | 108d39.68'e | Svyatoy Nos Peninsula - Offshore SE coast |
| SN9 | 24June91 | 1430h | 53d31.66'n | 108d36.39'e | Svyatoy Nos Peninsula - SE coast near cape |
| SN10 | 24June91 | 1730h | 53d29.86'n | 108d31.71'e | Svyatoy Nos Peninsula - Cape Nizhneye Lzgolov'ye |
| SN-C | 24June91 | 2200h | 53d38.0'n | 108d40.0'e | Svyatoy Nos Peninsula - night stop in fog |
| SN11 | 25June91 | 0900h | 53d51.33'n | 108d56.62'e | Svyatoy Nos Peninsula - north coast west of cape |
| SN12 | 25June91 | 1200h | 53d50.49'n | 109d02.54'e | Svyatoy Nos Peninsula - NE coast south of cape |
| SN13 | 25June91 | 1400h | 53d48.78'n | 109d05.00'e | Svyatoy Nos Peninsula - small island off NE coast |
| SN14 | 25June91 | 1530h | 53d45.96'n | 109d01.59'e | Svyatoy Nos Peninsula - hot springs |
| SN | 25June91 | 1630h | 53d41.8'n | 109d02.2'e | Svyatoy Nos Peninsula - Kurbulik - Bread stop |
| SN15 | 25June91 | 1845h | 53d40.24'n | 109d07.40'e | Chivyrkuyskii Bay - Baklaniy Island |
| SN-F | 25June91 | 2000h | 53d51.7'n | 108d58.0'e | Svyatoy Nos Peninsula - north coast - Fish stop |
| SN-C | 25June91 | 2200h | 53d51.98'n | 109d02.11'e | Svyatoy Nos Peninsula - camp |
| SN | 26June91 | 0852h | 53d51.98'n | 109d02.11'e | Svyatoy Nos Peninsula -Cape Verkhneye Lzgolov'ye |
| SN16 | 26June91 | 0930h | 53d48.6'n | 109d04.2'e | Svyatoy Nos Peninsula - East coast northern point |
| SN17 | 26June91 | 1200h | 53d47.62'n | 109d03.57'e | Svyatoy Nos Peninsula - East coast next point south |
| SN | 26June91 | 1430h | 53d41.8'n | 109d02.2'e | Svyatoy Nos Peninsula - Kurbulik - Bread stop |
| SN18 | 26June91 | 1600h | 53d39.91'n | 109d00.56'e | Svyatoy Nos Peninsula - East coast 4th point south |
| B19 | 26June91 | 1800h | 53d41.65'n | 109d09.85'e | Barguzin coast - east of Baklaniy Island |
| B20-C | 26June91 | 2200h | 53d50.36'n | 109d13.41'e | Barguzin coast - camp with raised shores |
| B20A | 27June91 | 1010h | 53d52.41'n | 109d14.51'e | Barguzin coast |
| B21 | 27June91 | 1019h | 53d53.28'n | 109d15.57'e | Barguzin coast |
| B21A | 27June91 | 1127h | 53d53.75'n | 109d16.07'e | Barguzin coast - northern turn point |
| UI22 | 27June91 | 1449h | 53d51.14'n | 108d44.26'e | Malyy Ushkanji Island - east side |
| UI22A | 27June91 | 1500h | 53d51.20'n | 108d42.68'e | Malyy Ushkanji Island - south tip |

| ID | Date | Time | Latitude | Longitude | Location |
|---|---|---|---|---|---|
| UI22B | 27June91 | 1505h | 53d51.35'n | 108d42.87'e | Malyy Ushkanji Island - south tip |
| UI23 | 27June91 | 1800h | 53d50.6'n | 108d38.5'e | Bolshoi Ushkanji Island - southeast side |
| SN24-C | 27June91 | 2058h | 53d44.48'n | 108d44.81'e | Svyatoy Nos Peninsula - camp site - fish stop |
| UI25 | 28June91 | 0927h | 53d51.64'n | 108d36.27'e | Bolshoi Ushkanji Island - west side - dyke |
| OLC1 | 28June91 | 1711h | 53d17.76'n | 107d50.36'e | Ol'khon Island - offshore NE coast - photo mosaic |
| OLC2 | 28June91 | 1722h | 53d16.35'n | 107d48.21'e | Ol'khon Island - offshore NE coast - photo mosaic |
| OLC3 | 28June91 | 1730h | 53d15.44'n | 107d47.00'e | Ol'khon Island - offshore NE coast - photo mosaic |
| OLC4 | 28June91 | 1740h | 53d14.23'n | 107d45.16'e | Ol'khon Island - offshore NE coast - photo mosaic |
| OLC5 | 28June91 | 1747h | 53d13.41'n | 107d43.55'e | Ol'khon Island - offshore NE coast - photo mosaic |
| OL26 | 29June91 | 0800h | 52d47.4'n | 106d36.4'e | Ol'khon Peninsula - Aya - port call |
| OL26A | 29June91 | 1051h | 51d48.99'n | 106d34.87'e | Ol'khon Peninsula - sag ponds |
| OL26B | 29June91 | 1110h | 52d49.05'n | 106d35.33'e | Ol'khon Peninsula - sag ponds |
| OL26C | 29June91 | 1150h | 52d50.11'n | 106d35.54'e | Ol'khon Peninsula - sag ponds |
| OL26D | 29June91 | 1340h | 52d47.26'n | 106d35.83'e | Ol'khon Peninsula - sag ponds |
| OL26E | 29June91 | 1405h | 52d47.39'n | 106d36.25'e | Ol'khon Peninsula - sag ponds |
| OL27-C | 29June91 | 2200h | 53d28.4'n | 107d33.0'e | Primorskii coast - Zama Delta - camp site |
| OL28 | 30June91 | 0830h | 53d35.36'n | 107d35.67'e | Primorskii Fault - north of Cape Khulgana |
| OL29 | 30June91 | 1235h | 53d24.46'n | 107d46.59'e | Ol'khon Island - north tip - Cape Khoboi |
| OL29A | 30June91 | 1516h | 53d15.76'n | 107d45.28'e | Ol'khon Island - NE coast - valley north of Ishimey |

end of reconnaissance aboard T/x Treskov - start of land field work

| | | | | | |
|---|---|---|---|---|---|
| OL-C | 30June91 | 2100h | 53d01.94'n | 106d45.11'e | Ol'khon Peninsula - Mykhur Camp |
| OL30 | 01July91 | 1005h | 53d02.18'n | 106d45.02'e | Ol'khon Peninsula - Primorskii graben |
| OL30A | 01July91 | 1027h | 53d02.37'n | 106d44.63'e | Ol'khon Peninsula - Primorskii graben |
| OL31 | 01July91 | 1207h | 53d03.17'n | 106d43.47'e | Primorskii Fault - south of Sarma delta |
| OL31A | 01July91 | 1326h | 53d02.74'n | 106d44.61'e | Ol'khon Peninsula - Primorskii graben |
| OL-C | 01July91 | 2200h | 53d01.94'n | 106d45.11'e | Ol'khon Peninsula - Mykhur Camp |
| OL32 | 02July91 | 1506h | 53d24.12'n | 107d25.48'e | Primorskii Fault - Zunduk Valley |
| OL32A | 02July91 | 1630h | 53d24.24'n | 107d25.90'e | Primorskii Fault - Zunduk Valley |
| OL32B | 02July91 | 1706h | 53d24.52'n | 107d25.55'e | Primorskii Fault - Zunduk Valley |
| OL32C | 02July91 | 1801h | 53d25.0'n | 107d26.0'e | Primorskii Fault - Zunduk Valley |
| OL32D | 02July91 | 1900h | 53d25.28'n | 107d25.08'e | Primorskii Fault - Zunduk Valley |
| OL-C | 02July91 | 2200h | 53d31.38'n | 107d32.10'e | Primorskii coast - Kaltygey camp |
| OL33 | 03July91 | 0900h | 53d26.0'n | 107d31.3'e | Primorskii Fault - Zama Delta |
| OL34 | 03July91 | 1006h | 53d26.77'n | 107d31.47'e | Primorskii Fault - Zama Delta |
| OL35 | 03July91 | 1235h | 53d27.29'n | 107d31.79'e | Primorskii Fault - Zama Delta |
| OL35A | 03July91 | 1351h | 53d27.10'n | 107d32.02'e | Primorskii Fault - Zama Delta |
| OL35B | 03July91 | 1504h | 53d27.61'n | 107d32.70'e | Primorskii Fault - Zama Delta |
| OL35C | 03July91 | 1535h | 53d27.76'n | 107d32.69'e | Primorskii Fault - Zama Delta |
| OL35D | 03July91 | 1628h | 53d28.97'n | 107d31.69'e | Primorskii Fault - Zama Delta |
| OL-C | 03July91 | 2000h | 53d31.38'n | 107d32.10'e | Primorskii coast - Kaltygey camp |
| OL36 | 04July91 | 0917h | 53d30.62'n | 107d32.04'e | Primorskii Fault - Kaltygey block |
| OL36A | 04July91 | 1043h | 53d30.63'n | 107d32.14'e | Primorskii Fault - Kaltygey block |
| OL37 | 04July91 | 1445h | 53d34.49'n | 107d34.87'e | Primorskii Fault - Kulgana delta |
| OL38 | 04July91 | 1535h | 53d34.89'n | 107d34.89'e | Primorskii Fault - Kulgana delta |
| OL38A | 04July91 | 1530h | 53d34.87'n | 107d35.18'e | Primorskii Fault - Kulgana delta |
| OL39 | 04July91 | 1651h | 53d34.94'n | 107d35.31'e | Primorskii Fault - Kulgana delta |
| OL | 04July91 | 1800h | 53d38.0'n | 107d35.5'e | Primorskii coast - Onguren - no bread |
| OL-C | 04July91 | 2000h | 53d31.38'n | 107d32.10'e | Primorskii coast - Kaltygey camp |
| OL40 | 05July91 | 0957h | 53d22.39'n | 107d21.71'e | Primorskii Fault - south of Cape Zunduk |
| OL41 | 05July91 | 1105h | 53d18.93'n | 107d21.71'e | Primorskii Fault - south of Cape Oto-Khushun |
| OL42 | 05July91 | 1240h | 53d12.11'n | 106d59.94'e | Primorskii Fault - north of Kurma |
| OL-C | 05July91 | 2200h | 53d01.94'n | 106d45.11'e | Ol'khon Peninsula - Mykhur Camp |
| OL43 | 06July91 | 1030h | 52d53.5'n | 106d36.5'e | Ol'khon Peninsula - sag ponds |

| ID | Date | Time | Latitude | Longitude | Location |
|---|---|---|---|---|---|
| OL43A | 06July91 | 1200h | 52d52.6'n | 106d34.8'e | Ol'khon Peninsula - sag ponds |
| OL43AB | 06July91 | 1230h | 52d53.0'n | 106d34.9'e | Ol'khon Peninsula - sag ponds |
| OL43B | 06July91 | 1400h | 52d53.48'n | 106d35.70'e | Ol'khon Peninsula - sag ponds |
| OL43C | 06July91 | 1500h | 52d53.92'n | 106d36.09'e | Ol'khon Peninsula - sag ponds |
| OL43D | 06July91 | 1700h | 52d54.05'n | 106d36.39'e | Ol'khon Peninsula - sag ponds |
| OL-C | 06July91 | 2200h | 53d01.94'n | 106d45.11'e | Ol'khon Peninsula - Mykhur Camp |
| OL44 | 07July91 | 1000h | 53d02.4'n | 106d49.3'e | Ol'khon Peninsula - NW most point |
| OL-C | 07July91 | 1500h | 53d00.2'n | 106d42.5'e | Ol'khon Peninsula - Charnarood |
| OL-C | 07July91 | 1500h | 53d00.2'n | 106d42.5'e | Irkutsk Polytechnic field Camp |
| OL-C | 07July91 | 2200h | 53d01.94'n | 106d45.11'e | Ol'khon Peninsula - Mykhur Camp |
| OL45 | 08July91 | 1300h | 53d09.8'n | 106d50.5'e | Primorskii Fault - Sarma Valley |
| OL46 | 08July91 | 1530h | 53d08.5'n | 106d49.9'e | Primorskii Fault - Sarma Valley |
| OL52 | 08July91 | 1800h | 53d07.6'n | 106d50.4'e | Primorskii Fault - Sarma Valley |
| OL-C | 08July91 | 2200h | 53d01.94'n | 106d45.11'e | Ol'khon Peninsula - Mykhur Camp |
| OL | 09July91 | 1100h | 53d01.2'n | 106d54.0'e | Ol'khon Peninsula - MRS ferry |
| OL | 09July91 | 1200h | 53d01.4'n | 106d56.2'e | Ol'khon Island - Tashkay ferry |
| OL53 | 09July91 | 1353h | 53d11.37'n | 107d19.56'e | Ol'khon Island - west coast - Khuzhir - lunch |
| OL-B | 09July91 | 1630h | 53d11.6'n | 107d20.3'e | Ol'khon Island - west coast - Khuzhir - Bread |
| OL54 | 09July91 | 1935h | 53d12.85'n | 107d23.39'e | Ol'khon Island - west coast - Kharantsi |
| OL-C | 09July91 | 2200h | 53d18.08'n | 107d37.39'e | Ol'khon Island - west coast - Cape Saga Camp |
| OL55 | 10July91 | 0753h | 53d18.08'n | 107d37.39'e | Ol'khon Island - west coast - Cape Saga |
| OL56 | 10July91 | 1032h | 53d18.54'n | 107d38.42'e | Ol'khon Island - west coast - Cape Saga |
| OL57 | 10July91 | 1239h | 53d19.18'n | 107d44.59'e | Ol'khon Island - NE coast - Khaga-Yaman |
| OL57A | 10July91 | 1417h | 53d18.75'n | 107d44.18'e | Ol'khon Island - NE coast |
| OL58 | 10July91 | 1500h | 53d18.39'n | 107d44.20'e | Ol'khon Island - NE coast |
| OL58A | 10July91 | 1554h | 53d17.91'n | 107d44.13'e | Ol'khon Island - NE coast |
| OL58B | 10July91 | 1630h | 53d17.57'n | 107d44.36'e | Ol'khon Island - NE coast |
| OL58C | 10July91 | 1708h | 53d17.39'n | 107d44.64'e | Ol'khon Island - NE coast |
| OL58C | 10July91 | 1708h | 53d17.39'n | 107d44.64'e | Ol'khon Island - NE coast - 3-D fix 914m |
| OL | 10July91 | 1239h | 53d19.18'n | 107d44.59'e | Ol'khon Island - NE coast - Khaga-Yaman |
| OL-C | 10July91 | 2000h | 53d18.08'n | 107d37.39'e | Ol'khon Island - Cape Saga Camp |
| OL59 | 11July91 | 1005h | 53d15.61'n | 107d29.85'e | Ol'khon Island - Cape Budun |
| OL60 | 11July91 | 1130h | 53d14.24'n | 107d27.25'e | Ol'khon Island - Kharantsi |
| OL61 | 11July91 | 1300h | 53d13.5'n | 107d24.7'e | Ol'khon Island - Kharantsi |
| OL-B | 11July91 | 1600h | 53d11.6'n | 107d20.3'e | Ol'khon Island - Khuzhir-Bread |
| OL-C | 11July91 | 2200h | 53d01.94'n | 106d45.11'e | Ol'khon Peninsula - Mykhur Camp |
| OL62 | 12July91 | 1202h | 52d48.56'n | 106d29.59'e | Ol'khon Peninsula - N. Anga Valley |
| OL63 | 12July91 | 1256h | 52d48.93'n | 106d29.59'e | Ol'khon Peninsula - N. Anga Valley |
| OL63A | 12July91 | 1350h | 52d49.09'n | 106d29.57'e | Ol'khon Peninsula - N. Anga Valley |
| OL64 | 12July91 | 1418h | 52d49.20'n | 106d29.33'e | Ol'khon Peninsula - N. Anga Valley |
| OL64A | 12July91 | 1442h | 52d49.53'n | 106d29.27'e | Ol'khon Peninsula - N. Anga Valley |
| OL64B | 12July91 | 1459h | 52d49.47'n | 106d29.21'e | Ol'khon Peninsula - N. Anga Valley |
| OL65 | 12July91 | 1556h | 52d49.63'n | 106d28.66'e | Ol'khon Peninsula - N. Anga Valley |
| OL-G | 12July91 | 1846h | 52d47.37'n | 106d22.83'e | Ol'khon Peninsula - Eulantsy-Fuel |
| OL-C | 12July91 | 2000h | 52d31.42'n | 106d01.89'e | Ol'khon Peninsula - Bugul'deika camp site |
| OL66 | 13July91 | 1017h | 52d31.29'n | 106d01.40'e | Ol'khon Peninsula - Bugul'deika graben W. |
| OL66A | 13July91 | 1100h | 52d31.21'n | 106d01.23'e | Ol'khon Peninsula - Bugul'deika graben W. |
| OL67x | 13July91 | 1245h | 52d31.66'n | 106d02.01'e | Ol'khon Peninsula - Bugul'deika graben W. |
| OL67x | 13July91 | 1245h | 52d31.66'n | 106d02.01'e | Ol'khon Peninsula - Bugul'deika 3-D fix 601m |
| OL67 | 13July91 | 1414h | 52d31.87'n | 106d02.31'e | Ol'khon Peninsula - Bugul'deika graben W. |
| OL67A | 13July91 | 1725h | 52d32.33'n | 106d02.43'e | Ol'khon Peninsula - Bugul'deika graben W. |
| OL67B | 13July91 | 1748h | 52d32.19'n | 106d02.52'e | Ol'khon Peninsula - Bugul'deika graben W. |
| OL68 | 13July91 | 1605h | 52d32.45'n | 106d02.70'e | Ol'khon Peninsula - Bugul'deika graben W. |
| OL68 | 13July91 | 1605h | 52d32.45'n | 106d02.70'e | Ol'khon Peninsula - Bugul'deika 3-D fix 670m |
| OL-C | 13July91 | 2000h | 52d31.42'n | 106d01.89'e | Ol'khon Peninsula - Bugul'deika camp site |

| ID | Date | Time | Latitude | Longitude | Location |
|---|---|---|---|---|---|
| OL69 | 14July91 | 1053h | 52d31.93'n | 106d03.46'e | Ol'khon Peninsula - Bugul'deika graben E. |
| OL69A | 14July91 | 1143h | 52d31.88'n | 106d03.38'e | Ol'khon Peninsula - Bugul'deika graben E. |
| OL70 | 14July91 | 1340h | 52d32.86'n | 106d03.76'e | Ol'khon Peninsula - Bugul'deika Valley |
| OL70A | 14July91 | 1404h | 52d32.98'n | 106d03.78'e | Ol'khon Peninsula - Bugul'deika Valley |
| OL71 | 14July91 | 1426h | 52d33.37'n | 106d03.88'e | Ol'khon Peninsula - Bugul'deika Valley |
| OL | 14July91 | 1521h | 52d48.53'n | 106d03.39'e | Kosava Stepp |
| OL-C | 14July91 | 2200h | 53d01.94'n | 106d45.11'e | Ol'khon Peninsula - Mykhur Camp |
| OL72 | 15July91 | 1116h | 52d53.63'n | 106d37.54'e | Ol'khon Peninsula - sag ponds |
| OL73 | 15July91 | 1203h | 52d53.93'n | 106d37.12'e | Ol'khon Peninsula - sag ponds |
| OL73A | 15July91 | 1230h | 52d54.10'n | 106d37.18'e | Ol'khon Peninsula - sag ponds |
| OL74 | 15July91 | 1250h | 52d54.33'n | 106d37.83'e | Ol'khon Peninsula - sag ponds |
| OL75 | 15July91 | 1344h | 52d54.65'n | 106d37.62'e | Ol'khon Peninsula - sag ponds |
| OL76 | 15July91 | 1508h | 52d55.05'n | 106d37.81'e | Ol'khon Peninsula - sag ponds |
| OL77 | 15July91 | 1518h | 52d55.09'n | 106d37.39'e | Ol'khon Peninsula - sag ponds |
| OL77 | 15July91 | 1518h | 52d55.09'n | 106d37.39'e | Ol'khon Peninsula - sag ponds - 3-D fix 597m |
| OL78 | 15July91 | 1613h | 52d54.88'n | 106d37.32'e | Ol'khon Peninsula - sag ponds |
| OL78A | 15July91 | 1619h | 52d54.90'n | 106d37.34'e | Ol'khon Peninsula - sag ponds |
| OL78A | 15July91 | 1619h | 52d54.90'n | 106d37.34'e | Ol'khon Peninsula - sag ponds - 3-D fix 657m |
| OL-C | 15July91 | 2200h | 53d01.94'n | 106d45.11'e | Ol'khon Peninsula - Mykhur Camp |
| OL-C | 16July91 | 2200h | 53d01.94'n | 106d45.11'e | Ol'khon Peninsula - Mykhur Camp |
| OL | 17July91 | end of field work. transport by land back to Irkutsk. | | | |

# BAIKAL RIFT ZONE: OL'KHON-BARGUZIN REGION TOPOGRAPHY

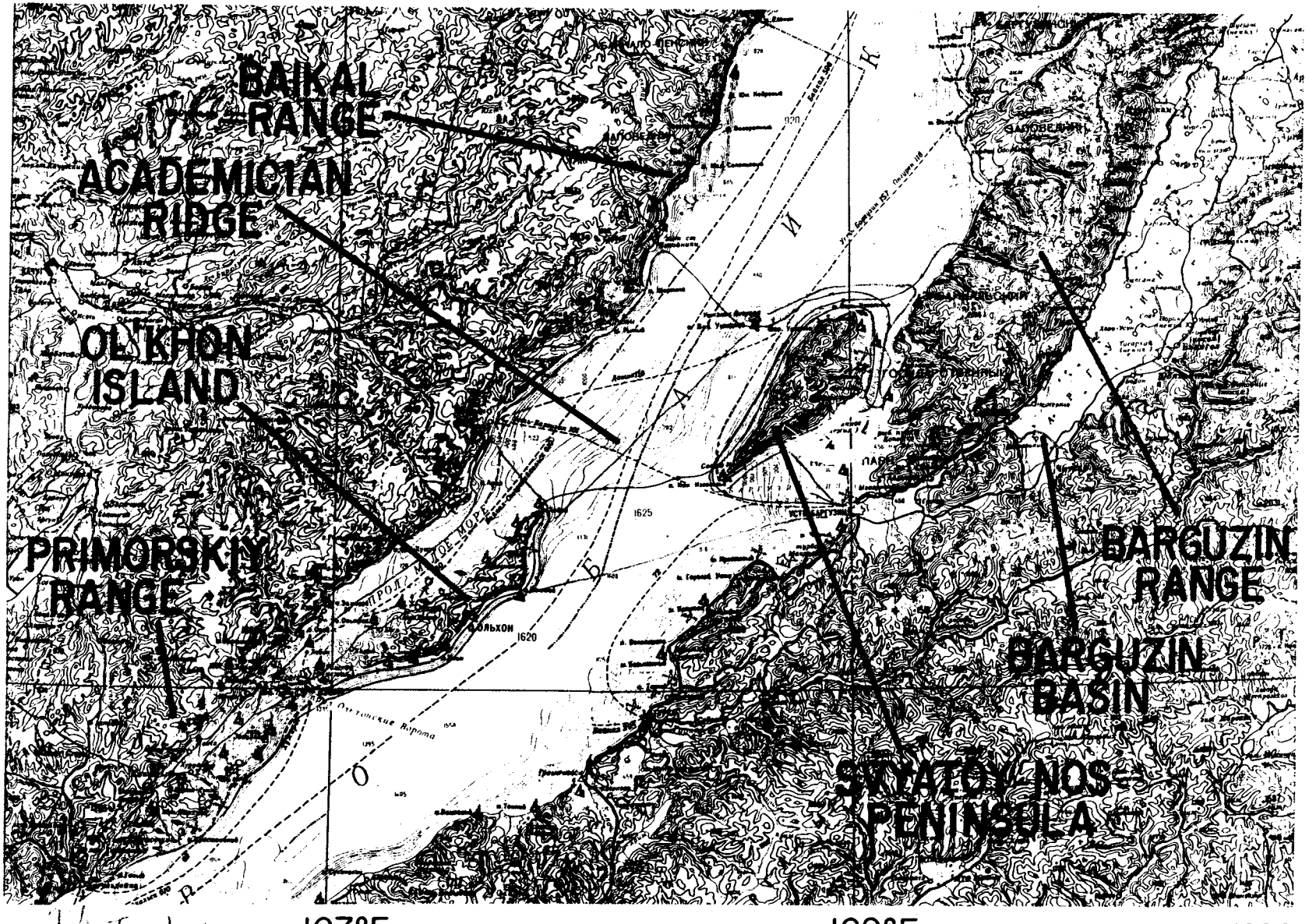
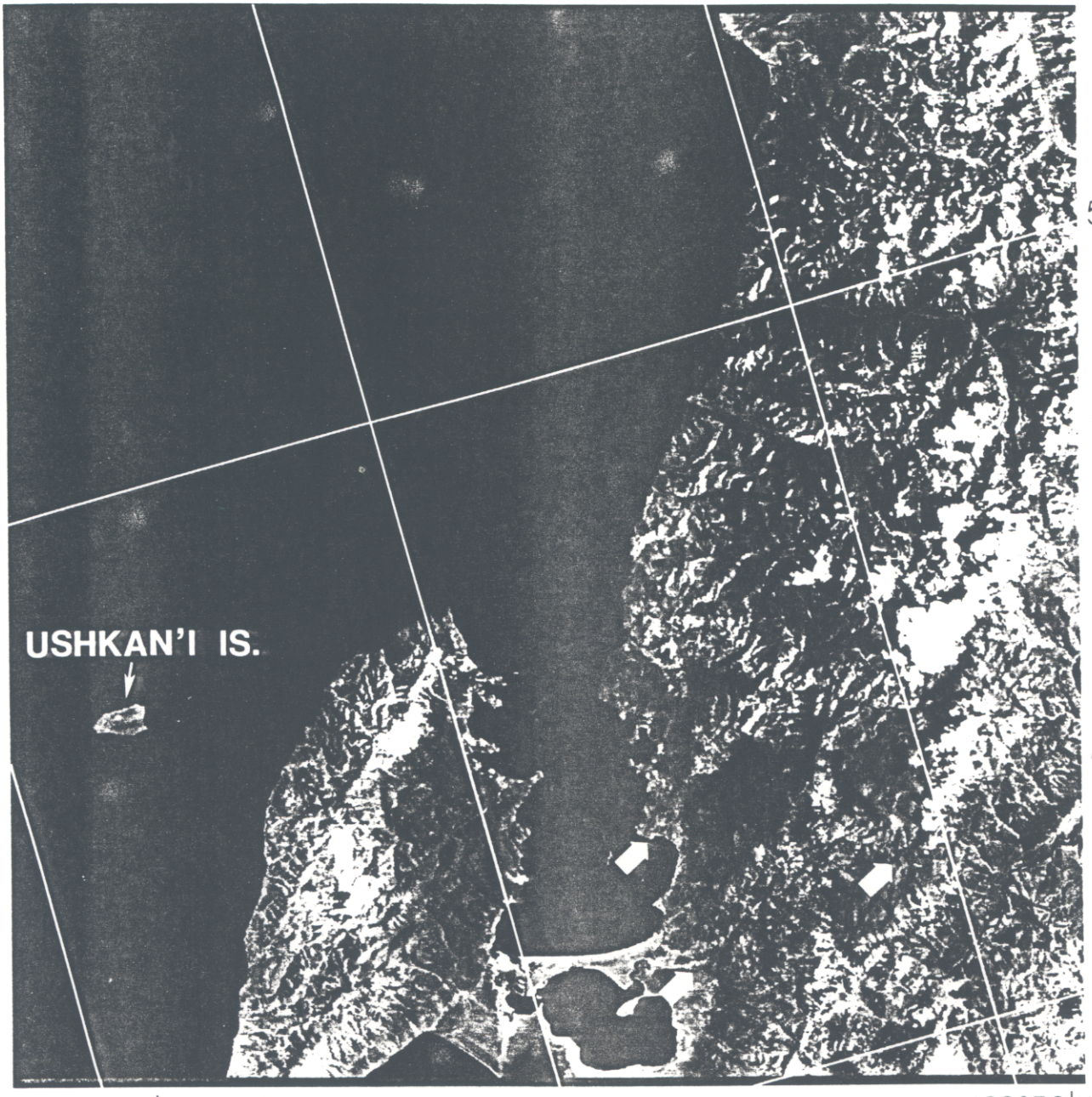



Fig. 1

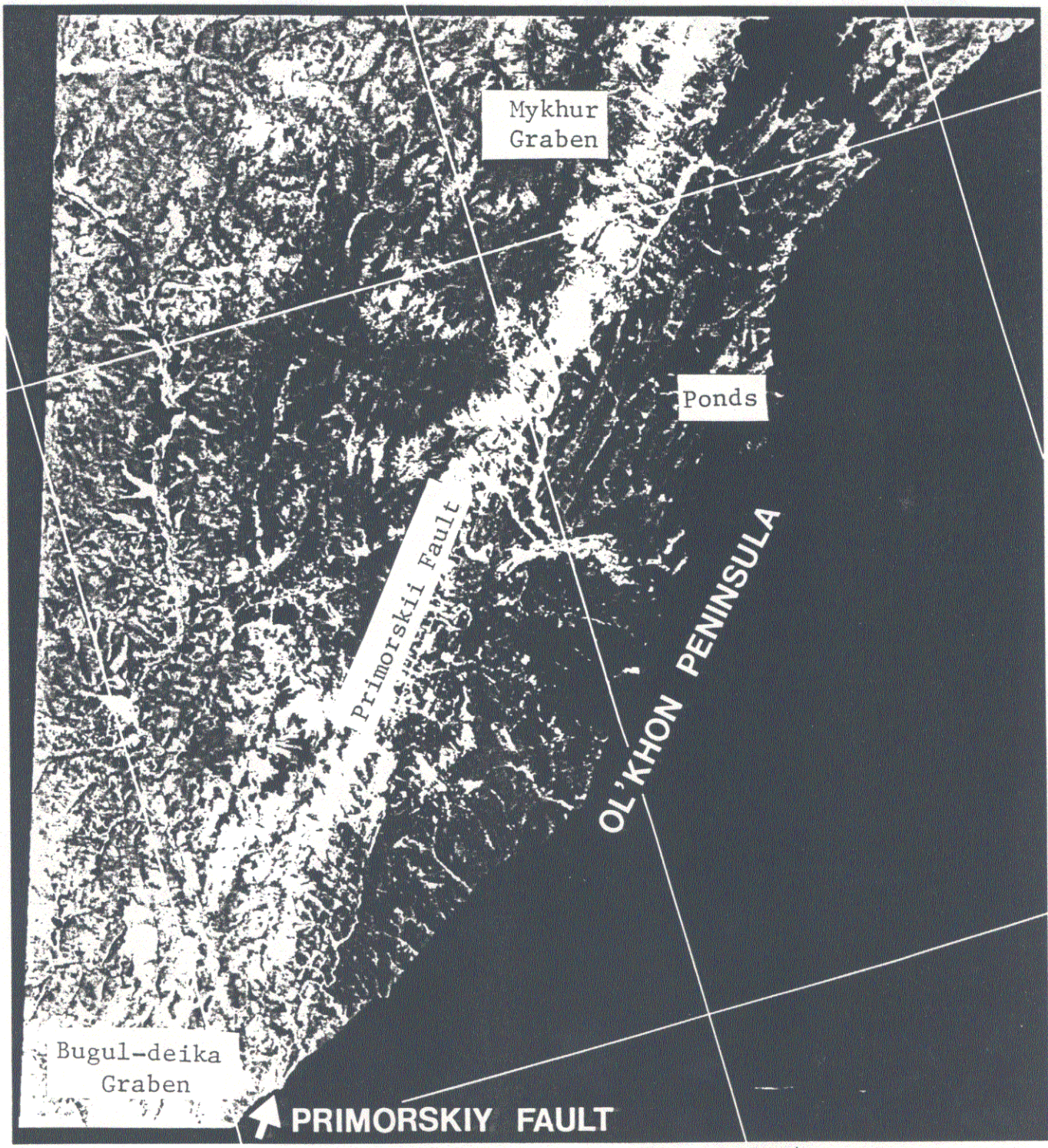
# LAKE BAIKAL - BARGUZIN REGION




LANDSAT 2 (MSS) BAND 7
8 JULY 1975

Fig 2

# LAKE BAIKAL-OL'KHON REGION

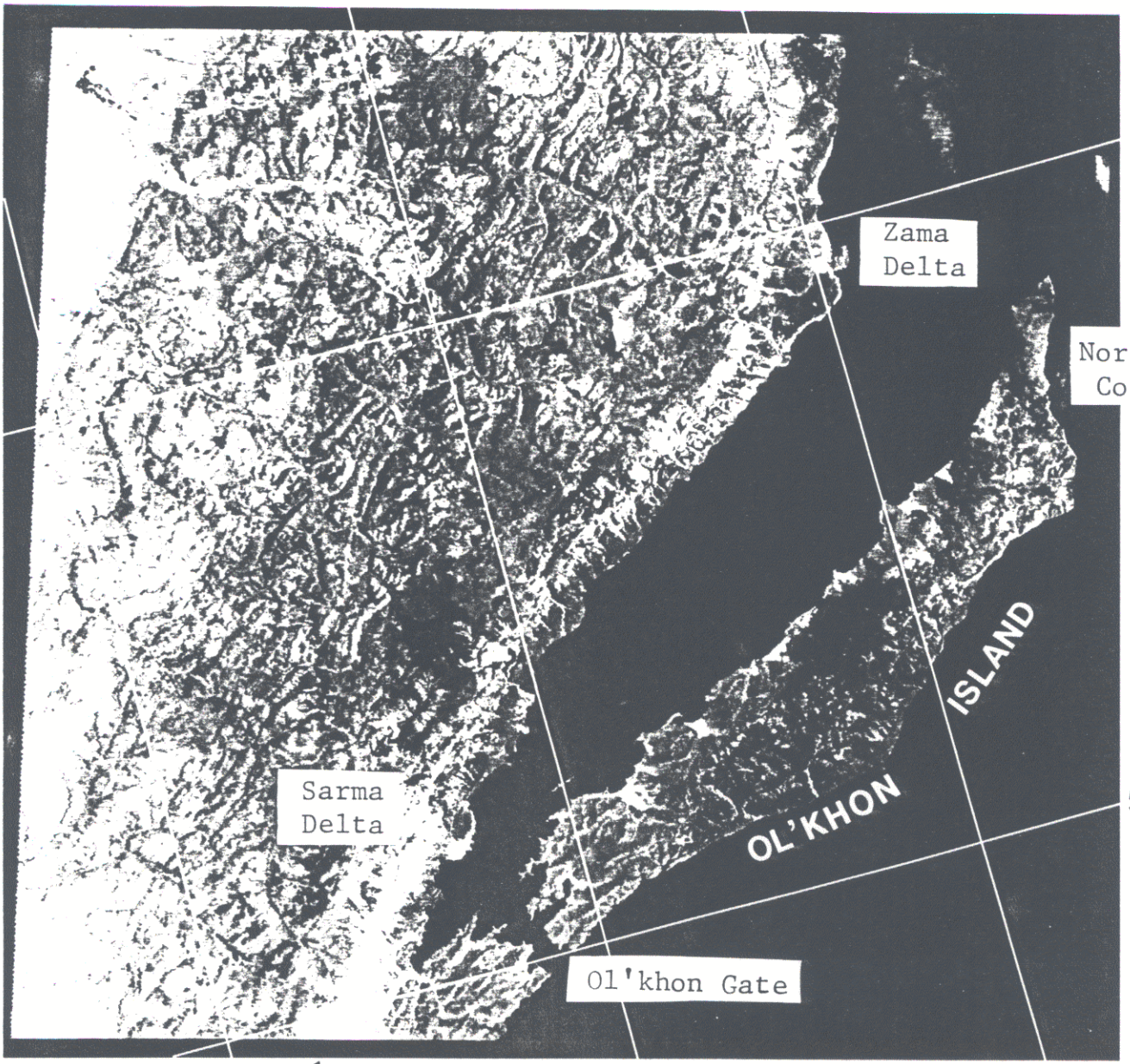



LANDSAT 2 (MSS) BAND 7
21 JUNE 1975

0 5 10 15 KILOMETERS

Fig 3

# LAKE BAIKAL-OL'KHON AREA




LANDSAT 2 (MSS) BAND 7
21 JUNE 1975

PRIMORSKIY FAULT

Fig 4