SCICEX ACCOMMODATION DATA
USS SCRANTON (SSN 756) LANTSUBICEX 1-01

1. Background.

   a. From 1993 through 1999, the U.S. Navy supported six Arctic missions dedicated solely to the collection of environmental data. These six Submarine Arctic Science Cruise (SCICEX) missions collected a wide variety of scientific data using both Navy- and scientist-provided sensors operated both by Navy personnel and embarked scientists.

   b. Because of the reduction in the size of the U.S. Submarine Force, such dedicated cruises are not currently possible. In 2000, the Navy signed a Memorandum of Agreement with the Office of Naval Research and National Science Foundation to continue data collection insofar as was possible using "SCICEX Accommodation" cruises. These are classified Navy deployments to the Arctic that spend part of their time collecting environmental data based on priorities established by a Science Advisory Committee. Because of time and classification constraints, this collection will be made using normally-installed Navy sensors and embarked Navy personnel. Though this collection will necessarily be smaller in scope than that collected on the dedicated missions, it still constitutes the majority of what was considered "baseline" SCICEX data.

   c. This is the second SCICEX Accommodation cruise. It is also the first SCICEX mission of any kind conducted using the Improved LOS ANGELES (688I) class submarine. Because the Navy has been operating this class in the Arctic for less time than the STURGEON (637) class (used for all previous SCICEX/SCICEX Accommodation missions), not all of the "baseline" sensors and equipment have been modified for installation. The number and variety of such systems carried aboard this class of submarine should increase over the next years to equal those which had been installed on the earlier 637 class missions.

2. Data Collected.

   a. Description. There were three types of data collected during this mission, described below. Their format, and that of supporting data, are described in paragraph 4 below.

      (1) Expendable CTD Data. The bulk of the data was collected using Submarine-Launched Expendable Conductivity-Temperature-Depth (U/I SSXCTD or, more simply, "XCTD") probes. These are launched from the submarine at any depth (in this case, all launches were made from 350 feet), ascend to a depth of 40 feet then begin their descent. During the descent, temperature and conductivity are measured and transmitted back to the submarine over a telemetry wire. Onboard, they are recorded on a computer along with an associated depth derived from a drop-rate algorithm. These are the same types of probes used on all previous SCICEX/SCICEX Accommodation cruises.

      (2) Topsounder Data. Ice draft measurements were made using a high-frequency, upward-looking, narrow-beam sonar. These were recorded continuously on an analog strip chart. This system is different than that used on previous missions and was not digitized onboard. It is intended that these strip charts be digitized ashore (post-cruise) and the corresponding ice draft data distributed at a later date.

      (3) Bottom Soundings. Bottom soundings were made using a high-frequency, narrow-beam sonar. They were recorded every half-hour and in conjunction with the launch of each XCTD, and are listed in the Operations Log.

b. Track. The SCICEX Accommodation Science Advisory Committee has designated that the highest priority data to be collected during these cruises is to repeat all or part of the cross-basin transects which played a key role in the dedicated SCICEX cruises. SCRANTON was able to complete approximately half of this transect, starting from the Eurasian terminus (85N/46E) and continuing along a straight line eastward across the Arctic to the Makharov Basin (about 87N/180E). Following the convention established during the dedicated SCICEX cruises; XCTDs were launched at 16 nm intervals. Also, as best as could reasonably be accomplished, the submarine attempted to resume its transect following each probe launch at the location at which it broke off in order to permit the reconstruction of a continuous ice profile trace.

3. Conventions. The following conventions are used for this mission:

- All times are ZULU.

- Ship's heading is given in Polar Transverse

- Ship's depth is given in feet, measured at the keel

- Ship's speed is given in knots

4. Data Logs/Files. The following data is provided:

a. XCTD Data. These are given in three different formats. In all cases, the number used in the data file refers to the sequence number used in the Expendable CTD and Operations Logs.

(1) Raw Data Files ("RDFs"). These are the data in their original format, readable using Sippican's Mk 12 software program.

(2) English Export Data Files ("EDFs"). This is the XCTD data in English units exported to a data file capable of being imported into a wide variety of spreadsheet and other software programs.

(3) Metric Export Data Files ("EDFs"). This is the XCTD data in metric units exported to a data file capable of being imported into a wide variety of spreadsheet and other software programs.

b. Expendable CTD Log. This is a summary listing of all probes dropped. It includes the following information:

- Sequence Number. A serial listing of the probes, used to reference to the data file.

- Date and Time of Launch. Note that the time recorded in the data file is normally slightly different than the time given in this log. These differences result from clock errors in the recording computer and the fact that the Sippican program records the time at which the probe begins its descent. Where differences exist, the Expendable Probe Log should be relied upon as the accurate time of launch.

- Latitude/Longitude. The ship's position at the time of launch, given in geographic coordinates, to the nearest 0.1 minute.

- Launch Depth. Ship's depth at the time of launch.

- TWD. Total Water Depth, as measured by the ship's bottomsounder at the time of launch. This is the raw sounding corrected for ship's depth but not for sound velocity.

- Serial Number ("S/N"). The probe serial number. Note that all probe serials begin with "9911" indicating November 1999 manufacture date except for one "9903" (March 1999) probe.

- Remarks. Any amplifying information.

c. Operations Log. This is a tabular summary of the ship's operations during the period of SCICEX Accommodation. It is in the form of an Excel spreadsheet with different tabs for the two days involved. The following information is provided:

- Time (in Z).

- Course/Speed/Depth. A value is given for these parameters when a given course, depth, or speed is established. Thereafter, that value remained constant until a different entry is made. Where the ship was constantly maneuvering for probe launch or housekeeping, the entry "Various" is made.

- Position (Geographic Latitude/Longitude).

- TWD. Total Water Depth, as measured by the ship's bottomsounder every half hour and at the time of probe launches. This is the raw sounding corrected for ship's depth but not for sound velocity.

- XCTD No. When probes were launched, the sequence number of that launch.

- Remarks. Any amplifying information.

5. Narrative. The following narrative amplifies the events during the SCICEX Accommodation period. Because times of breaking/resuming track are enumerated in the Operations Log and the times of probe launch listed in both the Expendable CTD and Operations Logs, these events are not included in this narrative unless specific amplifying information is provided.

	3 June
0016	At start point for SCICEX. Launched first probe.
0030	Commenced transect.
0323	Temporarily lost topsounder recorder.
0334	Topsounder recorder still not back in operation. Will break track & circle back to our position before it failed, then resume the transect from that point once topsounder is regained.
0351	Resumed transect.
1256	Got no data from XCTD #11. Will launch another.
1306	Launched XCTD #12 (backup for #11). Again no data. Because we had good data at the last station, we'll move on rather than linger here any longer.
1531	Launched XCTD #14. Only got data down to about 900 feet. Although the trace obtained should be satisfactory to indicate all major changes in the water column since the last launch, we will launch a backup to try to get the deeper data.
1542	Launched XCTD #15 (backup for #14). No data – we'll move on. Post-facto note: this spate of problems (11, 12, 14, & 15) was the only difficulty we had with obtaining data throughout the entire transect.
1830	Launched XCTD #17. Will now break for daily housekeeping.
2209	Resumed transect.
	4 June
1452	Launched XCTD #31. Completed SCICEX data collection.

6. Photographs. A collection of photographs are provided showing SCRANTON on the surface. These may also be treated as unclassified. If used in a context in which the source should be cited, these may be credited as "U.S. Navy".