



Training Course:

**Management and Evaluation of River Catch and Effort
Information for Lower and Mid-Fraser River
Aerial-Roving-Access Creel Surveys**

May 2002

**Management and Evaluation of
River Catch and Effort Information for
Lower and Mid-Fraser River
Aerial-Roving-Access Creel Surveys**
(for MERCI 3 software system)

Training Course Manual

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Software required for this course can be obtained from:
<http://www.essa.com/downloads/merci/downloads.htm>

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Note to Participants

Things To Do *Before* Day 1

- Read through these course notes. While it is not expected that everything will make sense, these materials will help provide context for the workshop and improve your comfort with the content and exercises. The bulk of the workshop consists of an instructor presentation, hands-on exercises and open question and answers in each of the course’s 9 modules. Throughout, questions are encouraged.
- Complete the pre-course survey and provide a hard-copy to the course instructor the morning of the first day (Appendix I, enclosed).
- Install the software on the computer you will be bringing to/using at the training course. The steps required are outlined in Module 2 under “[Getting Started](#)”. (Note: if you do not have Internet access or otherwise cannot install the software in advance, please notify the course instructor. Install CDs will be available at the course location, but only a small amount of time is available the morning of Day 1 to install the software).

☞ Please report any installation problems to the course instructor prior to the course.

- You will be responsible for bringing a computer to the course location (or co-ordinating the provision of a workstation with the Lillooet Office). Ensure the computer you will be using at the course meets the following minimum specifications:
 - Windows 95/98/NT4/Windows 2000/XP
 - MS Excel and Access 97 (or later)
 - IBM PC compatible
 - 400 Mhz or greater Pentium, 128 MB RAM (64MB adequate)
 - monitor capable of 1024 x 768 resolution
 - minimum of 50 MB of hard disk space (considerably larger storage requirements needed for bootstrap confidence limit generation)
- Ensure the computer you are using has a Local Area Network (LAN) card/port for connecting to a file server computer (for multi-user data entry exercises). If you are unsure, contact your systems administrator.

Notes for Instructor

Basic Equipment Needed

- Install packs (software and training database from CD or downloaded from: <http://www.essa.com/downloads/merci/downloads.htm>)
- LCD computer projector
- 1 computer per participant meeting the following minimum specifications:
 - Windows 95/98/NT4/Windows 2000/XP
 - MS Excel and Access 97 (or later¹)
 - IBM PC compatible
 - 400 Mhz or greater Pentium, 128 MB RAM
 - monitor capable of 1024 x 768 resolution
 - minimum of 100 MB of hard disk space (considerably larger storage requirements needed for bootstrap confidence limit generation)
- Local Area Network (LAN) server computer for (multi-user data entry configuration only)

Things to Remember

- Obtain hard-copy printouts of the field data forms used for (a) catch interviews; (b) 24-hr effort surveys; (c) aerial overflights; and (d) weekly fishery regulations. Structure amount of data so that data entry module exercise can be completed in a reasonable time frame (e.g., <=45 minutes).
- Install the software the afternoon before the course begins.
- If course is to include a demonstration of multi-user data entry to a central file server (or LAN), make sure the system administrator is present (or readily available) during setup (most critical) and during the course. Review procedures for establishing user accounts to this LAN and determine if course participants need to be physically present the afternoon of the day before the course.
- Make sure the owner/user of any training computers with password protection are on hand during setup and the start of the course.
- Encourage participant questions, while ensuring that everyone stays on track with the course agenda and objectives.
- Emphasize the need to compact Access databases and make regular backups. Review NetMeeting as an option for circumventing e-mail/CD burning to work with large Access databases.

¹ MERC3 3 **does not** support Access 2000/XP database formats. However, Access 97 database can be operated using more recent versions of Access. Users should **NOT** convert the Access 97 database to the newer Access format(s).

Context and Objectives

Accurate catch estimates are integral to the assessment of fish stocks and the development and application of harvest rules for sustainable management. Producing accurate catch estimates is a skill that depends on knowing how to implement a statistically defensible survey design and properly use the management tool(s) available to manage the data generated. For Fraser River First Nation fisheries, aerial-roving-access creel surveys have been used for several years to generate catch estimates for sockeye and chinook salmon. During the winter of 2001/2002, the tool used since 1998 to manage the data and generate catch estimates – MERCİ² – was enhanced in a number of ways. Furthermore, key Fisheries and Oceans staff for both the Lower Fraser and Interior Areas have changed, and these individuals will be less experienced with the creel survey design and software system. **Because even the best tools can be misapplied under these conditions, a hands-on training course is a practical step towards effectively communicating the sophisticated statistical and software issues that must be understood.**

The purpose of this short 1½ day course is not to make participants experts in creel survey design and catch estimation. The goal of the course is to give participants an understanding of how the three components of the First Nations creel survey are used and practice with a powerful and flexible software application (MERCİ 3.0) for managing this data, so that they are able to take responsibility for the timely production of weekly species, gear and area specific catch estimates.

At the end of the course, you should have a good understanding of *how to*:

1. Calculate catch “by hand”, knowing how the raw survey data are used;
2. Prepare a MERCİ 3.0 database for data entry prior to the start of a new season;
3. Efficiently enter and update data using MERCİ 3.0;
4. Set appropriate pre-estimation options in MERCİ 3.0;
5. Generate catch estimates using MERCİ 3.0;
6. Generate and view catch reports *InExcel* using MERCİ 3.0;
7. Interpret and address special cases when the survey “breaks down”;
8. Work with the software and database between offices; and
9. Get further information on the creel survey.

² Management and Evaluation of River Catch Information

Workshop Agenda

MERC I 101

DAY 1 - May 29th 2002. 8:30AM - 11:45AM with a 15 minute break around 10:30.

Module 1: Catch estimation basics I (approx. 0.75 hour)

Module 1 provides an overview of the 3 independent surveys used to estimate catch in the lower and mid-Fraser River “aerial-roving-access” First Nations creel surveys. Using a simple spreadsheet, participants will be shown how catch is estimated from the raw survey data.

Module 2: Introduction to the MERC I software application (approx. 0.5 hour)

This module introduces the computer application and related components necessary to warehouse creel survey data and produce weekly catch and effort reports. How to obtain and install software updates from ESSA’s website.

Module 3: MERC I Access database file and management (approx. 0.75 hour)

This module introduces MERC I’s MS Access database and describes how to prepare the database prior to the beginning of a new fishing season. Topics include:

- purging a previous years data after copying and re-naming the most recent database;
- single vs. multi-user³ data entry configurations;
- cleaning lists of Harvesters, Observers, Native Bands, and Permit Numbers;
- establishing consistent naming conventions and other standards;
- compacting your database; and
- importance of frequent database back-ups.

Module 4: Data entry – hands on exercises (approx. 1.5 hours)

This module defines the basics of entering survey data from the EDIT – DATA ENTRY menu and leveraging MERC I 3’s new DATA EXPLORER.

Participant exercise: enter example data for all 3 components of the creel survey to a blank database. This data will be used in later exercises.

12:00-1:00: Lunch

DAY 1 – May 29th 2002. 1:00 – 4:45 with a 15 minute break around 2:45

Module 5: Catch estimation basics II (approx. 1 hour)

This module introduces MERC I’s pre-estimation setup options under the EDIT – ESTIMATION menu, introducing and explaining key assumptions:

- impact of different ratio estimators on estimated catch rates; and
- *spatial pooling of survey data (cpue and effort pooling scenarios).

³ Requires the ability to network participant computers to a common file server.

Module 6: Generating catch estimates (approx. 1 hour)

This module shows how to use MERCİ to generate weekly estimates of catch for each species, gear type, and management unit from the RUN – ESTIMATE menu.

Participant exercise: generate alternative catch estimates from the data entered in Module 4.

Module 7: Viewing output reports - InExcel (approx. 0.75 hour)

This module shows how to use MERCİ’s *InExcel* reporting tool to view estimates of catch, catch rate (cpue), and effort based on a pre-defined Excel template. Warnings related to manual extraction of catch estimates from the underlying database tables will be discussed.

Participant exercise: generate catch reports (and related statistics) in Excel from the estimates generated in Module 6.

DAY 2 - May 30th 2002. 9:00AM - 12:00AM with a 15 minute break around 10:15.

Adapt to change. Complete participant exercises (if necessary) and/or reconcile differences between catch estimates generated against the trainer database (“answer key”) and the participants database.

Module 8: When things go wrong – missing data and “estimator breakdown” (approx. 1.25 hours)

This module discusses a variety of catch underestimation problems that occur when the field program coverage is inadequate. Some suggestions are given for how to interpret and address these cases.

Open discussion / questions

Module 9: Remote communication using Microsoft NetMeeting / Other fundamental system administration topics (approx. 1.25 hours)

Module 9 introduces issues associated with distributed database maintenance and synchronization. Specific suggestions are made for working with MERCİ remotely (i.e., between offices) using Microsoft NetMeeting. Some “traditional” technology solutions are reviewed, with an emphasis on the use of FTP and VPN networking. Need for a clear assignment of a database administrator and procedures for checking-in and checking-out the database emphasized.

Open discussion / questions.

*** Participants complete anonymous course evaluation, adjourn...**

Module x: Making your own output reports – hands on exercise (*future topic*, approx. 2 hours)

This module walks you through the steps needed to produce your own output reports using MERCİ’s custom *InExcel* reporting tool. Requires familiarity with MERCİ database, relational database and referential integrity concepts, and how to construct queries in MS Access.

Module y: Advanced estimation features - generating estimates of precision using the Bootstrap (*future topic*, approx. 3 hours)

Generate standard error and confidence limit estimates from the data entered in Module 4.

MERCİ currently provides biased corrected bootstrap confidence intervals.

Currently, the generation of highly stratified precision statistics (area x week x species x gear) is performed using custom scripts in S-Plus. At the time of writing, these features have not been included directly in the MERCİ software.

Module 1 – Catch estimation basics I: example

Learning Objective:

At the end of Module 1, participants will understand how the field data is used to estimate catch.



Catch estimation basics

- Role of the 3 elements of the creel survey
 - [Simple example](#)



MERCİ 101

Training Course - 34

Catch in the upper Fraser River First Nation fishery is estimated using information gathered in three independent surveys:

- Roving and access site catch interviews;
- Aerial overflight counts of fishing gear (for entire management units); and
- 24-hr “around the clock” effort surveys (also called “24-hr spirals”).

MERCİ was designed to provide weekly estimates of catch for each species, gear type, and management unit (MU). MERCİ estimates catch as (subscripts pertaining to the gear type, species, MU, and week of interest are not indicated for ease of notation),

$$\hat{C} = f \cdot \hat{C}_{pue} \cdot \hat{E}$$

where, \hat{C} is the catch estimate, f is the number of days a particular fishery was legally open in a given MU and week, \hat{C}_{pue} is the estimated average catch.(net hour)⁻¹ for the fishery, and \hat{E} is the estimated average total daily effort (net hours.day⁻¹) in the fishery. This equation provides an accurate estimate of catch so long as each component is estimated independently without bias.

Estimates of the average catch rate, \hat{C}_{pue} , are obtained from the information gathered by roving and access site catch interviews. Estimates of average total daily effort, \hat{E} , are obtained by combining aerial overflight counts with 24-hr effort survey data. **The course instructor will provide a thorough overview of the study and demonstrate these calculations using a simple spreadsheet as part of the presentation.**

The most recent post-season review report describes the methodology in detail (see

<http://www.essa.com/downloads/merci/help.htm>).

Module 2 – Introduction to the MERCI software application

Learning Objective:

At the end of Module 2, participants will be comfortable navigating the MERCI application, understand the components required to properly run the software, and know how to obtain and install software updates.

Getting Started

Installation and System Requirements

If you do not have version 3.0 of the software installed on your computer, you should obtain a copy of the installation file on (<http://www.essa.com/downloads/merci/downloads.htm>) under “MERC3 Install pack / Software Updates”. Once you have provided login information, please choose “MERC3 3.0 (2002+)”. This will bring you to the secure download page for MERCI components. Select the “Complete installation” hyperlink and save the “merci3_full_install.zip” file to your hard disk. Unzip the file and double click the “Setupex.exe” file. Simply follow the on-screen prompts without changing any of the default options. (Note: you do not need to uninstall MERCI 2.3.2 prior to running Setupex.exe).

To obtain MERCI 3.0, you will require the following authentication information for these downloads at the time you click the “MERC3 Install pack / Software Updates” hyperlink:

User Name: xx

Password: xxxx

Do not distribute this user name and password information without prior consent from the responsible DFO project managers. As of May 2002, Bridget Ennevor (lower Fraser River area) or Les Jantz (mid Fraser River area) are authorized distributors.

Required Components

MERC3 will not operate appropriately without the following three components:

Application File

The executable file for the application. You have the correct version of the software if you have the file “MERC3_3.exe” on your system with a date of **14-Mar-2002, 04:14 PM**. After installation, this file should be located in the folder “..Program Files\ESSA Technologies Ltd\MERC3\”.

Updates to the MERCI application will occasionally be posted under the MERCI 3.0 downloads page (<http://www.essa.com/downloads/merci/downloads.htm>) under the heading “Minor Code Revisions” (hyperlink named “Download the MERCI 3.0 exe”). Notification e-mails will be sent when these postings are made. To apply the update, you simply *overwrite* your existing MERCI_3.exe with the updated MERCI_3.exe

file provided by the update.

Database

MERCİ uses its own MS Access 97 database. It is a recommended practice to create and save different database files for each fishing season, so the names of the files will depend on the whims of application users. To minimize errors and prevent unnecessary complications related to merging data, it is strongly recommended that only one database be used per season.

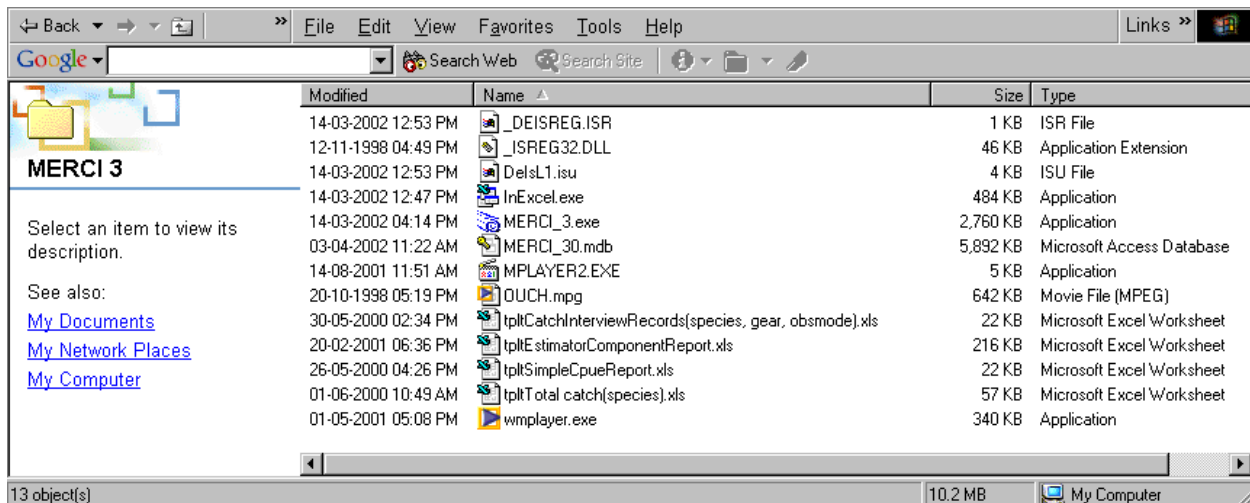
WARNING: Users of Access 2000/XP should not convert or update any MERCİ database to the format supported by these more recent editions of Access. Such a conversion will render the database unreadable by the MERCİ 3.0 application, effectively resulting in loss of data. Newer versions of Access may still be used to work with the database (by choosing not to update to the newer version).

At the start of a new fishing season, the previous season’s database should be “cleaned” (see Module 3), and used for data entry. By default, the MERCİ install program (Setup.exe) provides “MERCİ_30.mdb”. A trainee database will be supplied for the training course.

Updates to the MERCİ database will occasionally be posted under the MERCİ 3.0 downloads page (<http://www.essa.com/downloads/merci/downloads.htm>) under the heading “Database Templates” (hyperlink named “Empty MERCİ 3.0 database”). Notification e-mails will be sent when these postings are made.

Excel Report Templates

MERCİ 3.0 provides an easy to use [InExcel reporting feature](#) for generating custom catch reports in Excel. The required templates for generating catch statistics (prefixed with “tpl”) are installed in located in the folder “..\Program Files\ESSA Technologies Ltd\MERCİ 3\”. These 4 files are listed in the following screen shot:



These pre-defined Excel template files should not be moved, modified or deleted without knowledge of how to construct and implement *InExcel* reports.

Navigating MERC3

Refer to Sections 2.3.2 through 3.11 of the [MERC3 User’s Guide](#) for an overview of the basic features of the application. MERC3 has undergone a considerable overhaul between version 2 and 3, most notably in relation to the data entry interface and the underlying data design. The two previous enhancement projects did not include revisions to the software documentation or on-line help. As a consequence, the User’s Guide is somewhat out of date. However, the screens for setting pre-estimation options and generating estimates described in the User’s Guide are largely unchanged and the basic principles applicable.

Software Updates

The screenshot shows a web browser window displaying the ESSA Technologies website. The address bar shows the URL: <http://www.essa.com/downloads/merc3/downloads.htm>. The page features a blue header with the ESSA Technologies logo and navigation links: home, site map, contact us, About ESSA, Services, Our Team, Projects, Downloads, and Careers. The main content area is titled 'MERC3' and describes it as 'A data management and catch estimation system for aerial-access and aerial-roving creel surveys'. Under the 'Downloads:' section, there are three links:

- ◆ [MERC3 Training Course](#)
- ◆ [MERC3 2.0 User's Guide](#)
Adobe Acrobat .pdf file (917 kb)
- ◆ [MERC3 Install pack / Software Updates](#) - A password is required to download these files. Fisheries and Oceans Canada staff may contact:

Contact information for Clint Alexander is provided:

Clint Alexander
 ESSA Technologies Ltd. Telephone: (604) 733-2996
 Vancouver Fax: (604) 733-4657
 E-mail: calexander@essa.com

The page footer indicates 'Last modified: 05/10/2002 12:47:17'.

From time to time, Fisheries and Oceans may request minor software enhancements. Once such changes are complete, the DFO project manager or ESSA development team will advise all application users that the software has been updated. Updates can then be downloaded from the MERC3 3.0 downloads page (<http://www.essa.com/downloads/merc3/downloads.htm>) under the heading “Minor Code Revisions” (hyperlink named “Download the MERC3 3.0 exe”).

These updates provide new versions of the “MERCİ_3.exe” file. **To apply the updated exe file (which will have a more recent date), you must overwrite the previous “MERCİ_3.exe” file in the application folder “..\Program Files\ESSA Technologies Ltd\MERCİ 3”.**

For example, during construction of the trainer database for this course, the ESSA staff person responsible for data entry suggested a few simple changes that others may feel are warranted:

- The Enter key advances amongst fields in the same way as the Tab key;
- After a user clicks the Add button in a data entry form, the following fields are not re-set:
 - Lead Observer Name
 - Paper Sheet ID
- Use of a comma (and likely a few other special characters such as semicolons and colons) in Notes fields prevent data from being transferred; and
- The date element in the Filter feature of the MERCİ Data Explorer should use <= and >= equalities rather than just < and > (e.g., to see dates on August 10th, you must enter August 9th and August 11th).

With installation issues out of the way, the emphasis of Module 2 is an instructor-led, hands-on overview of how to operate and navigate the MERCİ application to perform the following core functions:

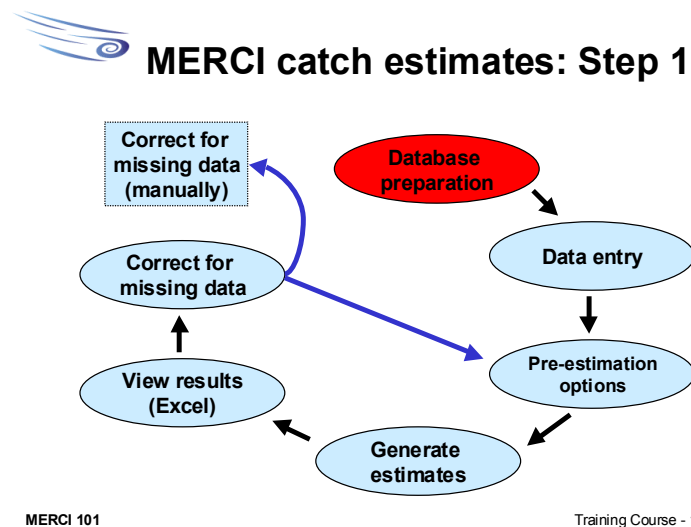
- data entry;
- setting estimation options;
- generating estimates; and
- viewing estimates.

Module 3 – MERCİ Access database preparation and management

Learning Objective:

At the end of Module 3, participants will be competent in completing the steps necessary to prepare a MERCİ database for use at the beginning of a new fishing season. You will also know how to properly maintain the database on a routine basis in-season.

Database Preparation



Purging a Previous Year's Data

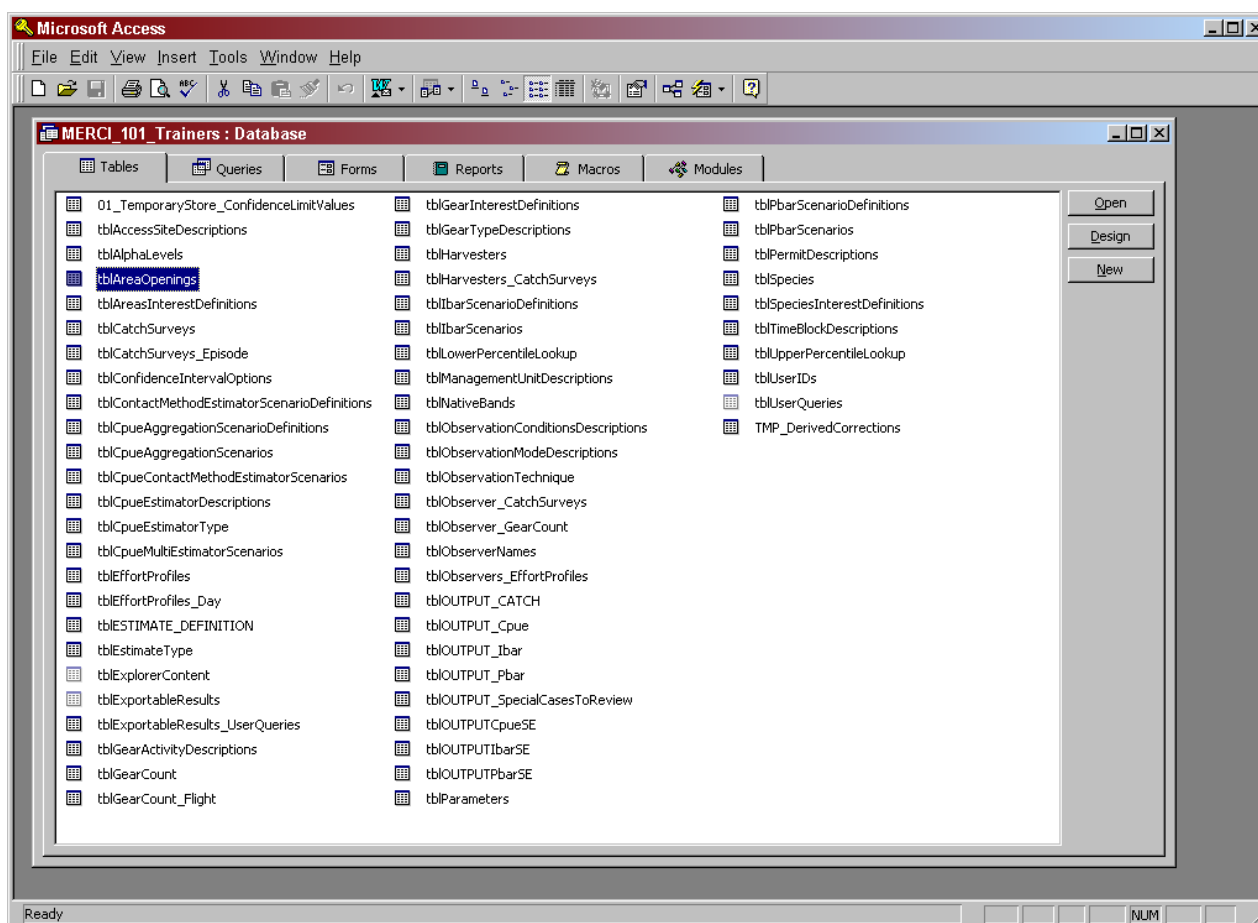
To maintain and protect each season's catch and effort data, **copy and re-name** the database at the end of each fishing season. This database will have the most up to date list of observers, harvesters, native bands, access sites, and other program elements from the current year. Copying and re-naming the database avoids the time consuming process of having to re-enter/update these variables from scratch each year.

With the previous years database backup made and a copy of this file re-named, **manually delete all of the records in (only) the following tables:**

Access 97 Table

- tblAreaOpenings
- tblCatchSurveys_Episode
- tblEffortProfiles_Day
- tblGearCount_Flight
- tblESTIMATE_DEFINITION

These tables are located under the Tables tab in MS Access:



Opening the table, selecting all the records, and then pressing the delete key accomplish this.

Cleaning Secondary Record Identification Variables

Over the course of data entry within a season, various identification elements (e.g., harvesters, observers, native bands, permit numbers etc.) may become “messy”. Most commonly, harvester and observer names are duplicated or entered with slight variations (e.g., Thomas Spence vs. Tommy Spence vs. T. Spence). This creates confusion for data entry personnel, and slows data entry rates as users may be inclined to sift through

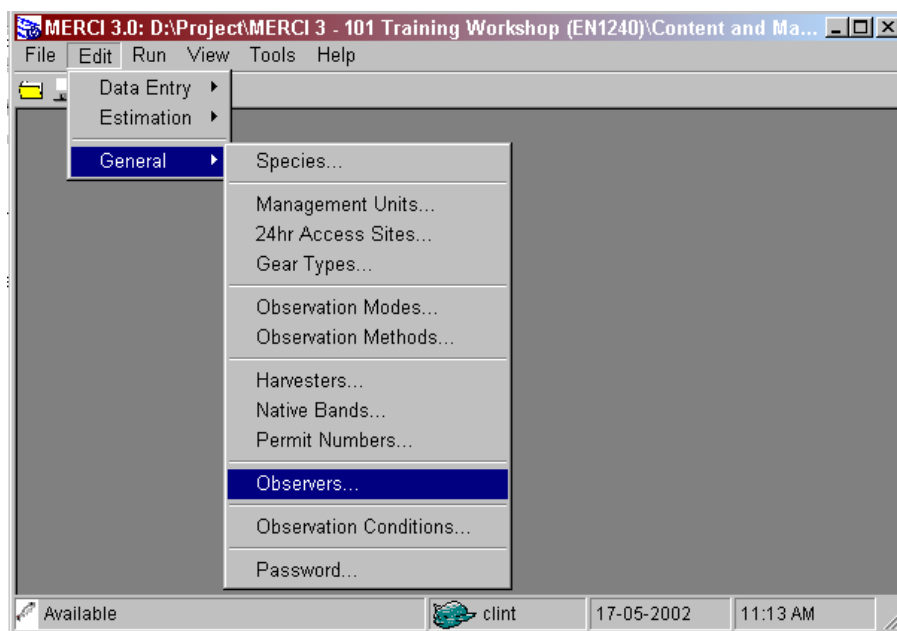
unnecessarily long or out of date lists of names. **Establish conventions and follow them!**

MERC3 allows users to delete, add, and replace record identification variables. The process involves:

1. Opening MERC3
2. Selecting the “new” re-named database file
3. Tidying up the lists of identification variables for:
 - Harvesters;
 - Observers;
 - Native Bands;
 - Permit Numbers; and possibly
 - adding any new Access sites, Management Units, gear types or species.

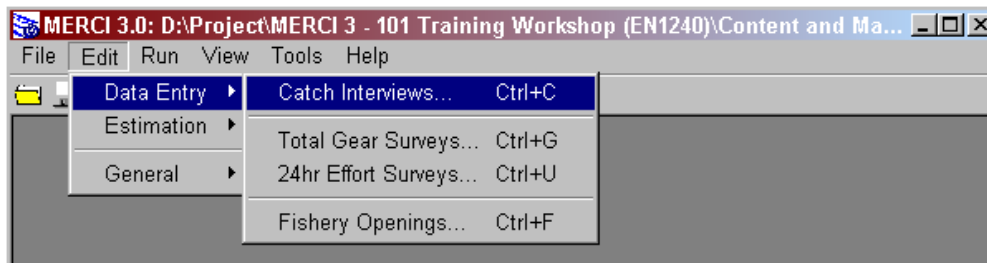
There are two basic “routes” for performing this cleaning:


(a) **If adding new records:**



Additions are made from a standard Edit form:

(b) If updating or deleting *existing* records:



To modify an existing record, MERCI requires you to first select the item you would like to change *from any one of the data entry screens* before making changes. To accomplish this, first select the item to be changed, and then click the  button:

Data Entry - Catch Interviews

View

Paper Sheet ID: UFR-2001-C-PE-4 (Optional)

Management Unit: D03: Sam Adams to Siwash Creek

Lead Observer: C. Narver

Date/Time Interview: 12-Aug-2001 17:05

Fishing Episode Start Date/Time: 12-Aug-2001 11:00

Fishing Episode End Date/Time: 12-Aug-2001 17:00 Hours: 6

All date formats follow: dd-mm-yyyy hh:mm

Primary | Secondary (Optional)

Gear Type: GN - GILL NET Number units of this gear: 1

Primary Gear Operator: - Not Provided - (Optional)

Catch by species

Survey Contact Mode: ROVING vehicle Completed Trip?

Chum

Species	Record Statistics	Catch	Release	Number Marked
Chinook	<input checked="" type="checkbox"/>		2	0
Sockeye	<input checked="" type="checkbox"/>		52	0
Coho	<input checked="" type="checkbox"/>		0	0
Pink	<input checked="" type="checkbox"/>		0	0
Steelhead	<input checked="" type="checkbox"/>		0	0

These checked species are those for whom data will be recorded (including zeros)

Marked - possible errors to primary data (due to translation of paper data forms)

Buttons: Add, Update, Delete, Clear All, OK, Cancel

Add Record | Delete | Update | Replace

Observer Name To Update:
C. Narver

New Observer Name:
Chris Narver

Description:

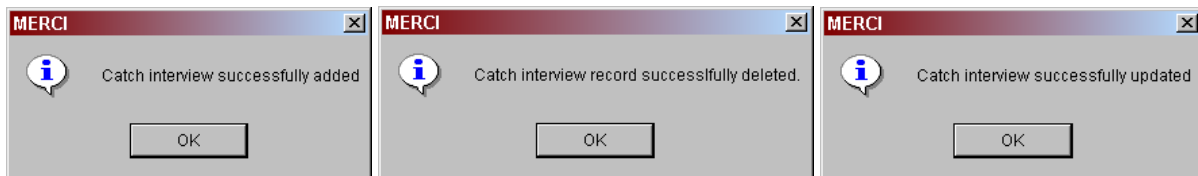
Update Cancel

You will find that the *Delete*, *Update* and *Replace* options will now be available.

Single vs. Multi-user Data Entry

Multi-user data entry has been improved considerably in MERCİ 3 and is highly recommended for efficiency reasons. To implement this time saving feature, the MERCİ Access database must be copied to a directory on a file server (LAN). Data entry technicians then open and work with the database on the network rather than their individual workstation. This allows multiple data entry technicians to simultaneously input data. MERCİ provides messages when another user is updating the same kind of data simultaneously, and prompts users to re-try. (This occurs by chance and for small groups of users (<10), will be exceedingly rare).

As with previous versions of MERCİ, *notification messages* are given when records have been successfully added, deleted or updated.

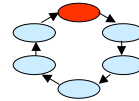


You may safely assume that records have been added, updated or deleted *only if this message is displayed*. If not, there has been an error or a record locking incident and the user should re-try the addition (or update).

Routine Practices



Database management



Good routine practices

- ✓ Consistent file naming
- ✓ Database compact and backup
- ✓ Sign-in sign out policy
- ✓ Data verification
- ✓ [Check error log](#)

Field data entry forms mirror software data entry screens

The system administrator should establish and implement a variety of routine practices aimed at maximizing efficiency and minimizing data entry errors or loss of data. These include:

- Consistent naming conventions for database files;
- Making frequent backup copies of the database;
- Establishing sign-in sign-out procedures between data entry staff and the lead technician responsible for producing catch estimates to ensure estimates are produced on the most up to date and complete data set. Most importantly:
 - Have any changes been made to last session’s database that have not been passed back to data entry staff (or vice versa)?
 - **Ensure the data entry staff do not continue to enter data to a copy of a database that is being used by the lead technician to produce catch estimates.**
 - * Some helpful technologies to assist with remote office data sharing and database synchronization are discussed in more detail in Module 9.
- Performing frequent data verification on randomly chosen records;
- Checking the MERCİ error log;
- Ensure field data entry forms correspond well to MERCİ’s data entry screens (new field data forms that meet this criteria will be provided at the course).

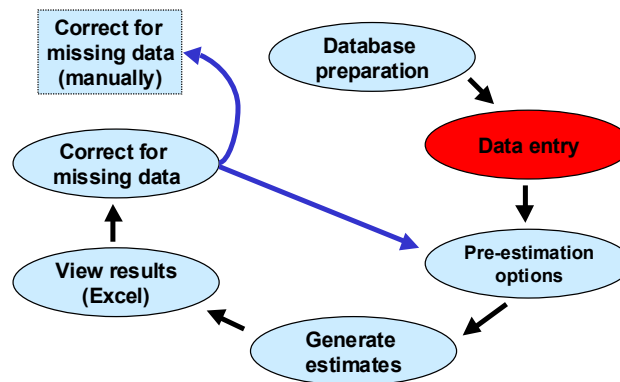
These practices must be clearly communicated and understood by all data entry staff. The course instructor will discuss the specific rationale for each item and give examples. Module 9 further emphasizes the role of database administrator in ensuring data synchronization amongst distributed users.

Module 4 – Data entry

Learning Objective:

At the end of Module 4, participants will be competent in entering, locating and updating fishery regulations, catch interviews, instantaneous gear count, and 24-hr effort data from field data forms.

MERCİ catch estimates: Step 2



MERCİ 101

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Field Data Forms

The Fraser River First Nation catch estimation program uses paper data forms for collecting three independent types of catch and effort information necessary to estimate catch. As part of training course material development, field data forms more consistent with the software data entry screens have been developed. It is strongly recommended that these forms – with required customizations – be used in 2002. (As these forms were not used in 2001, these forms will not be used for the training course). These improved forms are more consistent with MERCİ’s data entry screens and are provided below:

Note: the protocol for collecting data on these forms is outside the scope of this training course.

2002 Fraser River First Nations Total Gear Count Form

Lead Observer (First & Last Name): _____

Other Observers (First & Last Name): _____

Date (dd/mm/yy): ____ / ____ / ____

Page: ____ of ____

For Data Entry Use Only

Paper Sheet ID: UFR-G-2002-

marked - possible errors to primary data
(due to translation of paper data forms)

Weather Conditions:

- ___ Clear ___ Raining
- ___ Overcast ___ Calm
- ___ Light Fog ___ Windy
- ___ Dense Fog

Observation Mode:

- ___ Vehicle
- ___ Boat
- ___ Heli

River (looking downstream):

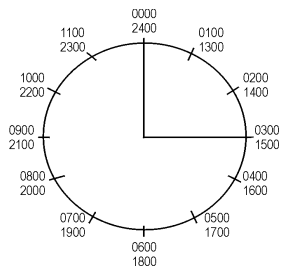
- ___ Right
- ___ Left
- ___ Both

Start Time (am / pm): _____

End Time (am / pm): _____

MU Location	Time Area Entered (24 - hr clock)	River Left				River Right				Total Gill Nets Active	Total Dip Nets Active	Total Rod and Reel Active	Total Gill Nets Inactive
		Gill Nets Active	Dip Nets Active	Rod and Reel Active	Gill Nets Beached	Gill Nets Active	Dip Nets Active	Rod and Reel Active	Gill Nets Beached				
D-01													
D-02													
D-03													
D-04													
D-05													
D-06													
D-07													
D-08													
D-09													
D-10													
D-11													
D-12													
Total													

Notes: _____



2002 Fraser River First Nations Catch Sampling Data Form

For Data Entry Use Only

Paper Sheet ID: UFR-C-2002- _____

marked - possible errors to primary data (due to translation of paper data forms)

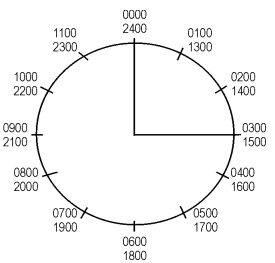
Lead Observer (First and Last Name): _____

Interview Date (dd/mm/yyyy): ____/____/____ Page: ____ of ____

Survey Contact Mode: Access Site Roving Boat Roving Vehicle Roving Foot

MU Location	Interview Time		Start of Fishing		End of Fishing		Gear Type	# of Nets	Primary Gear Operator (First and Last Name)	Complete Trip (x)	Chinook	Sockeye	Coho	Pink	Steelhead	Hail or Observed	Band Affiliation Permit Designation #
	dd/mm/yy	Time	dd/mm/yy	Time	dd/mm/yy	Time											
										C:							
										R:							
										M:							
										C:							
										R:							
										M:							
										C:							
										R:							
										M:							
										C:							
										R:							
										M:							
										C:							
										R:							
										M:							

Key: C = Catch No; R = Release No.; M = Marked No.



Secondary Information:
Other Observers (First and Last Name): _____

Please write comments on the back of this page.

Please fax data by noon on the Monday following the fishery to: Cynthia Breau (250) 256-2600.

2002 Upper Fraser River First Nations 24 Hour Effort Count Data Form

Lead Observer (First & Last Name):

Other Observers (First & Last Name):

24 Hr Access Site Name (use name not MU Location):

Start Date (dd/mm/yyyy): ____/____/____ Time: ____:____ (am / pm)

End Date (dd/mm/yyyy): ____/____/____ Time: ____:____ (am / pm)

For Data Entry Use Only

Paper Sheet ID: UFR-24Hr-2002-

marked - possible errors to primary data (due to translation of paper data forms)

Page: ____ of ____

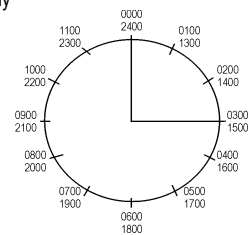
Time	Gill Nets Active	Dip Nets Active	Rod and Reel	Gill Nets Inactive	Time	Gill Nets Active	Dip Nets Active	Rod and Reel	Gill Nets Inactive
6:00 am (06:00)					6:00 pm (18:00)				
7:00 am (07:00)					7:00 pm (19:00)				
8:00 am (08:00)					8:00 pm (20:00)				
9:00 am (09:00)					9:00 pm (21:00)				
10:00 am (10:00)					10:00 am (22:00)				
11:00 am (11:00)					11:00 pm (23:00)				
12:00 noon (12:00)					12:00 midnight (24:00)				
1:00 pm (13:00)					1:00 am (01:00)				
2:00 pm (14:00)					2:00 am (02:00)				
3:00 pm (15:00)					3:00 am (03:00)				
4:00 pm (16:00)					4:00 am (04:00)				
5:00 pm (17:00)					5:00 am (05:00)				

Note: If no effort is seen at a particular time during a night spiral, please enter a zero for that time of the site visit

Weather Conditions:

____ Clear ____ Overcast ____ Light Fog ____ Dense Fog ____ Rainy ____ Calm ____ Windy

Comments:



Please Fax data by noon Monday following the fishery to: Cynthia Breau (250) 256-2600

MERCI Data Entry Screens

Field data is entered into one of three data entry screens under MERCI’s EDIT – DATA ENTRY menu.

Data Entry - Catch Interviews

View

Paper Sheet ID: (Optional)


Management Unit: ...

Lead Observer: ...

Date/Time Interview:

Fishing Episode Start Date/Time:

Fishing Episode End Date/Time: Hours:

 All date formats follow: dd-mm-yyyy hh:mm

Primary | Secondary (Optional)

Gear Type: ... Number units of this gear:

Primary Gear Operator: ... (Optional)

Catch by species

Survey Contact Mode: ... Completed Trip?

...

Species	Record Statistics	Catch	Release	Number Marked
Sockeye	<input checked="" type="checkbox"/>	0	0	0
Chinook	<input checked="" type="checkbox"/>	0	0	0
Coho	<input checked="" type="checkbox"/>	0	0	0

Number of fish that have or are likely to have experienced mortality due to harvest

Marked - possible errors to primary data (due to translation of paper data forms)

Data Entry - 24hr Effort Survey

View

Paper Sheet ID: MFR-2002-032 (Optional)
 Access Site: Tildon Site
 Lead Observer: A. ALECK
 Survey Start Date/Time: 19-Mar-2002 06:00 Day of week: Tuesday Applies to statistical week: 12

Primary | Secondary (Optional)

Survey Observation Mode: ACCESS SITE (By design, must be "Access site")

Units of gear observed for each hour of day

_BOAT GN (lower only) Record active only

GN - GILL N	Active
<input checked="" type="checkbox"/>	0
6:00:00 AM	1
7:00:00 AM	1
8:00:00 AM	1
9:00:00 AM	1
10:00:00 AM	1
11:00:00 AM	1
12:00:00 PM	1
1:00:00 PM	1
2:00:00 PM	1
3:00:00 PM	1
4:00:00 PM	1
5:00:00 PM	1
6:00:00 PM	1

Marked - possible errors to primary data (due to translation of paper data forms)

Buttons: Add, Update, Delete, Clear All, OK, Cancel

Data Entry - Total Gear Counts

View

Paper Sheet ID: MFR-2002-017 (Optional)
 Management Unit (MU): D03: Sam Adams to Siwash Creek
 Lead Observer: T. Joseph
 Date/Time Survey Enters MU: 19-Mar-2002 09:45 Applies to statistical week: 12

Reminders: +GN - GILL NET+ fishery regulations have not been defined for the specified location and week. If there were species-specific fishery regulations, it is strongly recommended you enter these before continuing to enter gear count information.

Primary | Secondary (Optional)

Survey Observation Mode: Helicopter (Should be an overflight mode)

Total units of gear observed in management unit

_BOAT GN (lower only) Record active only

	Active
GN - GILL NET <input checked="" type="checkbox"/>	11
DN - DIP NET <input checked="" type="checkbox"/>	3

Marked - possible errors to primary data (due to translation of paper data forms)

Buttons: Add, Update, Delete, Clear All, OK, Cancel

In addition to these three primary forms, fishery-opening data must also be entered before catch estimates can be generated.

Data Entry - Weekly Fishery Regulations

View

Opening Start Date/Time: 19-Mar-2002 00:00 ... All date formats follow: dd-mm-yyyy hh:mm

Opening End Date/Time: 21-Mar-2002 00:00 ...

Length opening (days): 2 Applies to statistical week: 12

Regulations

Species: Pink Sockeye Steelhead Sturgeon

Gear type(s): DN - DIP NET GN - GILL NET RR - ROD and REEL

Management Unit(s): D01: Sawmill Creek to Hells Gate D02: Hells Gate to Sam Adams D03: Sam Adams to Siwash Creek D04: Siwash Creek to Piglog Creek D05: Piglog Creek to Pooyelth Creek D06: Pooyelth Creek to Saw Creek (Skuppah) D07: Saw Creek to Stein River D08: Stein River to Texas Creek

When specifying regulations - you may select single or multiple species, gear types, and/or management units

Buttons: Add, Update, Delete, Clear All, OK, Cancel

Data entry examples will be shown during the on-screen presentation. You can also review some additional information about the features of these screens on the [MERC3 web site](#) (see "Highlights" and "Data Entry Interface").

Exercise

All course exercises require that field survey data be entered into MERC3 database. The first exercise does this. The instructor will provide each participant with the 3 primary types of data forms, and demonstrate their entry after which the participants will spend between 40 and 50 minutes entering the records. This exercise was designed to be completed using a multi-user configuration with a single database on a local file server (or LAN).

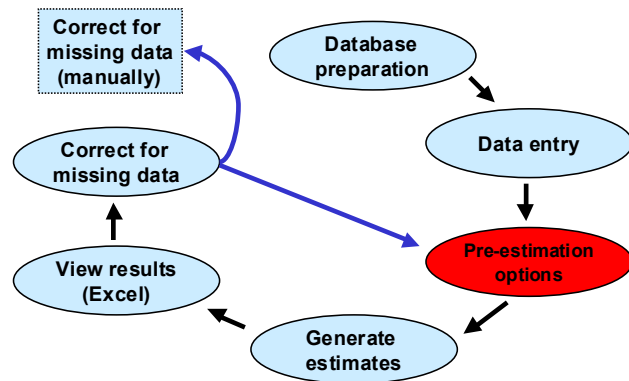
- Using information from the 2001 mid-Fraser River creel survey, enter the data from the supplied data forms. Only enter secondary information (e.g., harvesters, permit numbers, etc.) for the first page for each type of survey data then simply ignore this information. The task will be clear from earlier examples provided by your course instructor. In addition you will be free to ask questions.
 - You will have 45 minutes.

Module 5 – Catch estimation basics II: pre-estimation options

Learning Objective:

At the end of Module 5, participants will understand the importance of and be competent in changing MERCI’s various estimation options. These options determine what and how survey data are used to estimate catch in each management unit.

MERCI catch estimates: Step 3



MERCI 101

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Catch Rate

There are three options that determine what and how survey data are used to estimate the average catch rate in each management unit:

Option

- Exclude short soak times (n/a)
- Assign 1 of 2 estimators to different modes of contact (n/a)
- ***Interviews used to generate estimate in each MU**

Selecting the following menu option...



Opens the following form...

Use this form to choose the interviews used to generate catch rate estimates in each Management Unit.

Examples of setting these pre-estimation options will be shown during the on-screen presentation. You can also refer to Sections 5.4 through 5.6 of the [MERCİ Users Guide](#) to review these pre-estimation options under the EDIT – ESTIMATION menu.

Effort

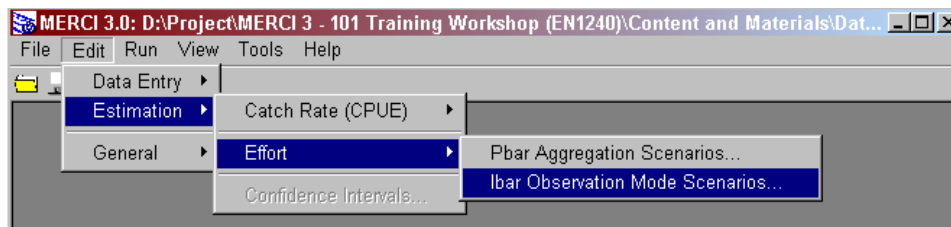
I_{bar} (average instantaneous net count)

MERCİ allows users to choose what combination of observation modes to use in computing the average instantaneous net count (I_{bar}). Normally, this should involve aerial overflight modes, but in some cases other modes of observation may be necessary. The minimum requirement is that the mode of observation covers the entire area encompassed by the management unit. If a mode of observation can only cover a portion of a management unit (e.g., for logistical/safety reasons), it should **not** be used to generate I_{bar} estimates in that location.

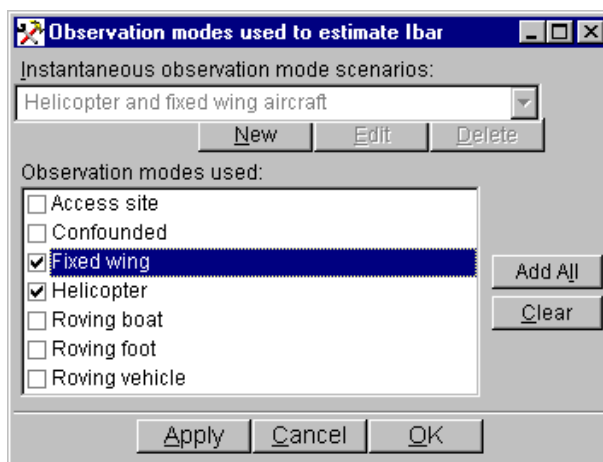
Option

- **Observation modes used in computing the average**

Selecting the following menu option...



...opens the following form.



Use this form to choose what combination of observation modes to use in computing the average instantaneous net count (Ibar).

Examples of setting these pre-estimation options will be shown during the on-screen presentation. You can also refer to Sections 5.4 through 5.6 of the [MERC3 Users Guide](#) to review these pre-estimation options under the EDIT – ESTIMATION menu.

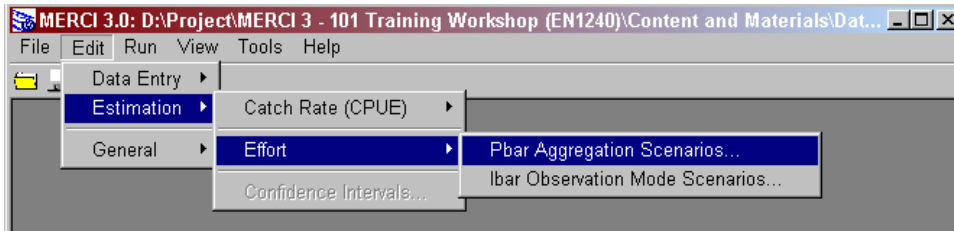
Pbar (proportion of harvesters fishing at the time(s) instantaneous counts were performed)

MERC3 allows users to choose the 24-hr effort survey observations that will be used to compute the average proportion of gear fishing at different times of the day in a particular management unit (Pbar). Because each access site only affords a view a small portion of the fishing area within any particular management unit, access site observations are usually pooled over several sites to better gauge the average pattern of fishing for the MU as a whole.

Option

- ***24-hr observations used to generate estimate in each MU**

Selecting the following menu option...



...opens the following form.

 A screenshot of the "Pbar aggregation scenarios" dialog box. At the top, it has a title bar with a close button. Below the title bar, there is a dropdown menu for "24-hour access site aggregation scenario" with "MID-FRASER - Default (2001)" selected. To the right of this dropdown are "New", "Edit", and "Delete" buttons. Below that is a "Description:" label followed by a text area containing the text: "Assumes 24-hour effort patterns are the SAME between Sawmill and Texas and Texas and Kelly. THIS SCENARIO SHOULD BE UPDATED WITH RESULTS OF IMPLEMENTING POST-SEASON REVIEW RECOMMENDATION TO INCREASE NUMBER AND". Below the description is a "Management Unit (MU):" label with a dropdown menu showing "D02: Hells Gate to Sam Adams". To the left of this dropdown is an information icon and a note: "Select the Access sites used to estimate the Management Unit's estimate of Pbar, by choosing Access site names from the list on the left and double-clicking them or pressing the 'Add' button." Below the note are two list boxes: "All Access site names:" and "Selected Access sites:". The "All Access site names:" list contains: Agassiz, Bridge River Rapids and Fountain, Chawathil, Chehalis, Coquihalla, Downstream of Old Bridge, Hunter Creek (Ohamil), Island 22, Kwoiek Site, Lakahahmen (McDonalds Beach), Mission Dock, Nicomen, Scowlitz (upriver), Seabird Bluffs, and Skway. The "Selected Access sites:" list contains: Elders Site, Lytton Ferry Site, and Siska Site. Between the two lists are "Add >>" and "<< Remove" buttons. Below the lists is an "Apply" button. At the bottom of the dialog are "OK" and "Cancel" buttons.

Use this form to choose what 24-hr observations will be used to generate Pbar estimates in each MU.

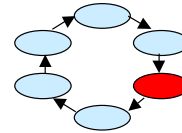
Examples of setting these pre-estimation options will be shown during the on-screen presentation. You can also refer to Sections 5.4 through 5.6 of the [MERC3 Users Guide](#) to review these pre-estimation options under the EDIT – ESTIMATION menu.

Recommended Defaults

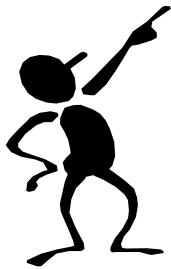
Different settings for these options will change the value of the estimated catch. Certain settings are more statistically defensible than others. The rationale for the suggestions in the next slide, and additional details will be discussed during the training course.



Different options change catch estimates



Recommended defaults:



MERCI 3 101

Catch rate	<p>Minimize spatial aggregation</p> <ul style="list-style-type: none"> • Isolate MUs with inherently high/low quality fishing sites • Isolate MUs with fishers of obviously higher or lower experience/catch capacity <p>Only use ratio of means Cpue estimator</p>
Ibar	<p>Only use aerial observation modes</p> <ul style="list-style-type: none"> • Use ground based methods if holes or unable to conduct enough overflights. • <i>But must cover entire MU!</i>
Pbar	<p>Minimize spatial aggregation</p> <ul style="list-style-type: none"> • Establish enough 24-hour monitoring sites to represent overall 24-hr pattern of fishing within management units

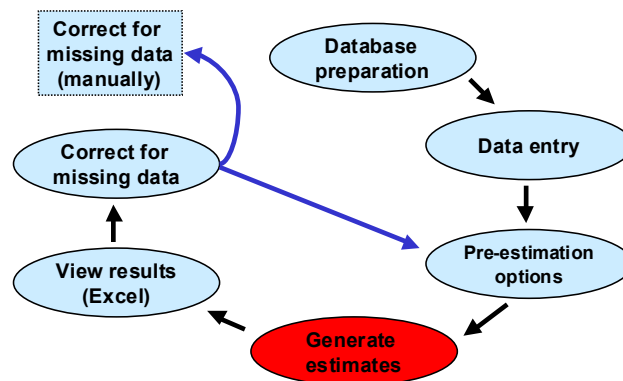
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Module 6 – Generating catch estimates

Learning Objective:

At the end of Module 6, participants will understand how to specify an estimation scenario and generate weekly catch estimates for each management unit, week, species, and gear type using MERCI.

MERCI catch estimates: Step 4



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Estimates are produced using MERCI’s RUN – ESTIMATE menu.



Selecting this menu option brings up the following screen:

MERC3 - Estimation Assumptions

Available estimate definitions:

TMP - test estimates on 1916 test date

Clint Alexander - ESSA Technologies March 13, 2002

Created: 13-03-2002 05:07:36 PM

Scope:

Areas of interest | Gear of interest | Species of interest | Dates of interest

D07: Saw Creek to Stein River

D08: Stein River to Texas Creek

D09: Texas Creek to Old Bridge (Lillooet)

D10: Thompson River to Bonaparte Confluence

D11: Old Bridge to Pavilion Creek

Add All

Clear

→

General:

Estimate type: Point estimates

Author: Clint Alexander

Use of survey data:

Effort | Cpu

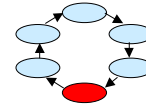
24-hour effort surveys used: MID-FRASER - Default (2001)

Mode(s) used to estimate total gear counts: Helicopter and fixed wing aircraft

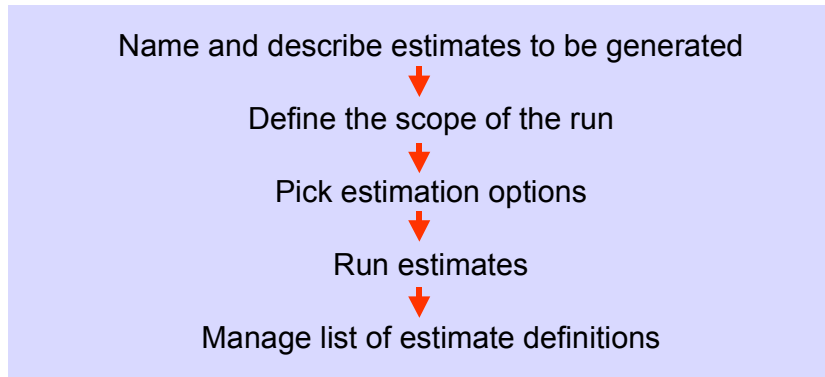
→

Apply All | Cancel | Perform Catch Calculations

This screen is used to perform the following five steps:



Generating catch estimates



MERCI 3 101

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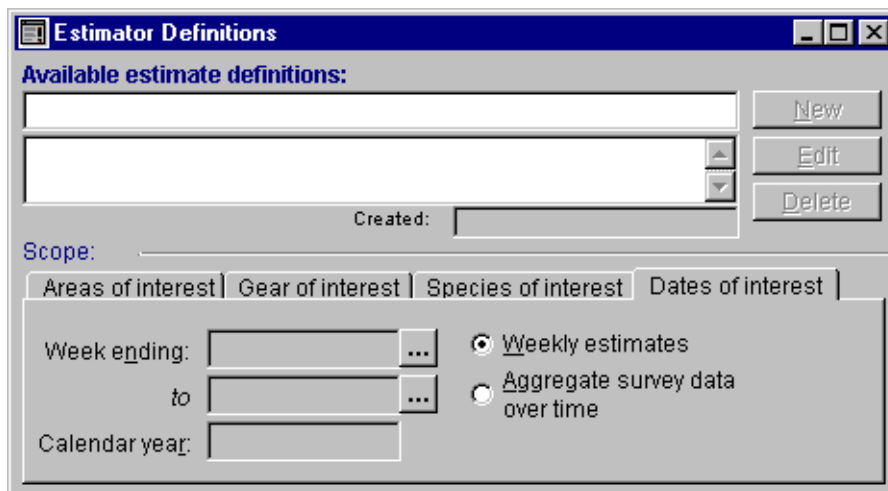
Examples of defining and generating estimates will be shown during the on-screen presentation. You can also refer to Sections 5.4 through 5.6 of the [MERCI Users Guide](#) to review these pre-estimation options under the RUN – ESTIMATE menu.

Choosing the Recommended Defaults

Refer to the heading of the same name in Module 5 above. The pre-estimation options discussed in Module 5 are applied to the estimation run using the RUN – ESTIMATE screen.

*The screen under the RUN – ESTIMATE menu also provides a few legacy options carried over from the first version of the software. These options are as follows, and users should specify the following settings:

(A) **Scope of run – Dates of interest** tab. Select “*Weekly estimates*” Weekly estimates



To obtain an estimate for just 1 week, select the same week ending dates.

(B) Use of survey data – Cpue tab. Select “*Weighted method*” under **Multi-estimator approach**:

The screenshot shows the 'Use of survey data' dialog box. At the top, 'Effort' is set to 'Cpue'. Below this, there are three dropdown menus: 'Catch interviews used' (MID-FRASER 2 - [D-03 and D-04 separated]), 'Contact method-estimator definition' (DEFAULT - Ratio of Means Only [RECOMMENDED]), and 'Multi-estimator approach' (DEFAULT - Weighted method). At the bottom, there is a section for 'Override pooling of survey data among MUs' with two radio buttons: 'Off' and 'On if n >= 20'. The 'On if n >= 20' option is selected, and the number '20' is entered in the adjacent text box. A left-pointing arrow button is located in the bottom right corner.

When computing Cpue, this option “weights” the two ratio estimators by the number of interviews obtained from roving and access site interview methods. **However, this option is overridden by specifying a scenario that estimates catch rates from the ratio of means only** (as shown).

The so called “*Hierarchical method*” should not be used.

(C) Use of survey data – Cpue tab. Option button settings:

This screenshot is identical to the one above, showing the 'Use of survey data' dialog box with the same settings: 'Effort' is 'Cpue', 'Catch interviews used' is 'MID-FRASER 2 - [D-03 and D-04 separated]', 'Contact method-estimator definition' is 'DEFAULT - Ratio of Means Only [RECOMMENDED]', 'Multi-estimator approach' is 'DEFAULT - Weighted method', and 'Override pooling of survey data among MUs' is set to 'On if n >= 20'.

MERC3 overrides the pooling of survey data specified by the “Catch interview pooling scenario” if n or more interviews are available for any one MU, in a particular week. It is a good practice to turn this option “On”, so that if ~ 20 or more catch interviews⁴ are realized within a given MU, in a particular week, the data pooling assumptions are not used.

The next screen shot shows an example of defaults for the effort tab. However, the details of “**24-hour effort surveys used**” will depend on user settings customized for the fishery with consideration of the trade-off between using a finer statistical stratification and sample size. Aerial observation modes are strongly preferred for providing complete, instantaneous gear counts.

⁴ The actual number is somewhat arbitrary, but variance usually stabilizes somewhere between 20-35 interviews.

Use of survey data:

Effort: Cpue

24-hour effort surveys used:
 MID-FRASER - Default (2001)

Mode(s) used to estimate total gear counts:
 Helicopter and fixed wing aircraft

➔

Managing the List of Estimate Definitions: A Warning



Delete

While it is a *good* practice to delete unneeded or out of date estimation scenarios, doing so while result in an irreversible loss of output data. Perform this house-cleaning operation with care.

Where Do the Catch Statistics Go?

MERCİ populates the following Access database tables with various catch statistics for each management unit, week, gear type, and species:

-  tblOUTPUT_CATCH
-  tblOUTPUT_Cpue
-  tblOUTPUT_Ibar
-  tblOUTPUT_Pbar

-  tblOUTPUTCpueSE
-  tblOUTPUTIbarSE
-  tblOUTPUTPbarSE

Run assumption information goes into:

 tblESTIMATE_DEFINITION

Deleting an “EstimateID” from this table from within MS Access deletes **all associated estimation output**.

Exercise

So that each user may learn how to configure catch estimates, these exercises should be conducted using a single-user configuration (i.e., database on local computer). If a multi-user configuration was used during the data entry exercise, participants should copy the main database from the file server to their individual workstations/laptops prior to performing these exercises.

1. Use the following assumptions to produce a base case estimate of catch for sockeye and chinook salmon between Sawmill Creek and Kelly Creek for the **week ending August 12th 2001**.

Name for catch statistics: **“Base case – (missed kwk)”**

Description: **“Catch estimation exercise 1”**

Effort estimation options (i.e., use...)

- **“MID-FRASER - Default (2001)”** for estimating average 24-hr effort patterns;
- **helicopter and fixed wing aircraft** observations to compute average instantaneous gear counts

Catch rate estimation options (i.e., use...)

- **“MID-FRASER - 1998 to 2000 Default”** for estimating catch rates;
- **“DEFAULT - Ratio of Means Only [RECOMMENDED]”** Cpue estimator;
- if **20 or more catch interviews** were realized within a given MU, data pooling assumptions are ignored.

2. Use the following assumptions to produce an **alternative estimate** of catch for sockeye and chinook salmon between Sawmill Creek and Kelly Creek for the week ending August 12th 2001.

Name for catch statistics: **“Base case – (kwk included)”**

Description: **“Catch estimation exercise 2”**

Effort estimation options (i.e., use...)

- **NEW “MID-FRASER - Default (kwk in) (2001)”** for estimating average 24-hr effort patterns;
- **helicopter and fixed wing aircraft** observations to compute average instantaneous gear counts

Catch rate estimation options (i.e., use...)

- **“MID-FRASER - 1998 to 2000 Default”** for estimating catch rates;
- **“DEFAULT - Ratio of Means Only [RECOMMENDED]”** Cpue estimator;
- if **20 or more catch interviews** were realized within a given MU, data pooling assumptions are ignored.

3. Use the following assumptions to produce a **third estimate** of catch for sockeye and chinook salmon between Sawmill Creek and Kelly Creek for the week ending August 12th 2001.

Name for catch statistics: **“Good stratification – (kwk included)”**

Description: **“Catch estimation exercise 3”**

Effort estimation options (i.e., use...)

- **“MID-FRASER - Default (kwk in) (2001)”** for estimating average 24-hr effort patterns;
- **helicopter and fixed wing aircraft** observations to compute average instantaneous gear counts

Catch rate estimation options (i.e., use...)

- **NEW “MID-FRASER 1 - [D01-D02; etc...”** for estimating catch rates;
- **“DEFAULT - Ratio of Means Only [RECOMMENDED]”** Cpue estimator;
- if **20 or more catch interviews** were realized within a given MU, data pooling assumptions are ignored.

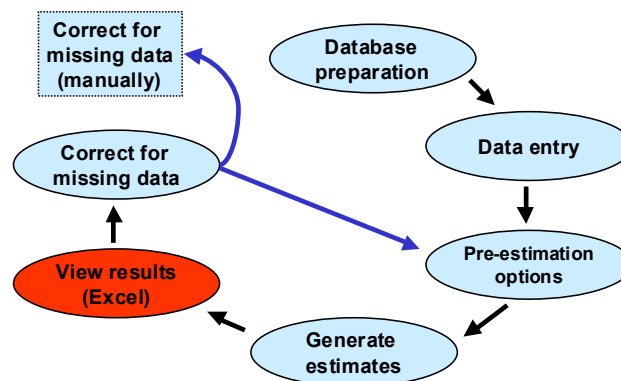
Module 7 – Viewing output reports *InExcel*

Learning Objective:

At the end of Module 7, participants will be able to use the *InExcel* feature of MERCI to export catch estimate results to Excel, where the results can be formatted, graphically displayed and analyzed to identify missing data and quickly build bottom-line reports.



MERCI catch estimates: Step 5

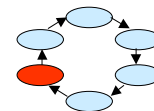


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Viewing catch estimates in Excel



Select "View|*InExcel*..." menu

↓

Select "Tools|Export Assistant..." menu

↓

Select desired report from "Reports" pane

↓

Highlight any query in "Associated User Queries" pane


↓

★ **Set parameters**

↓

Use "Primary Database Tables" pane to find parameters

↓

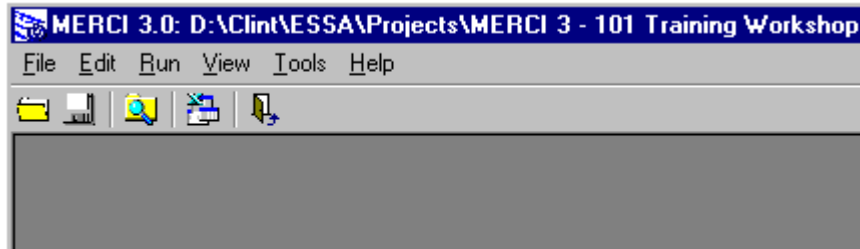
Click  to see results in Excel

MERCI 3 101

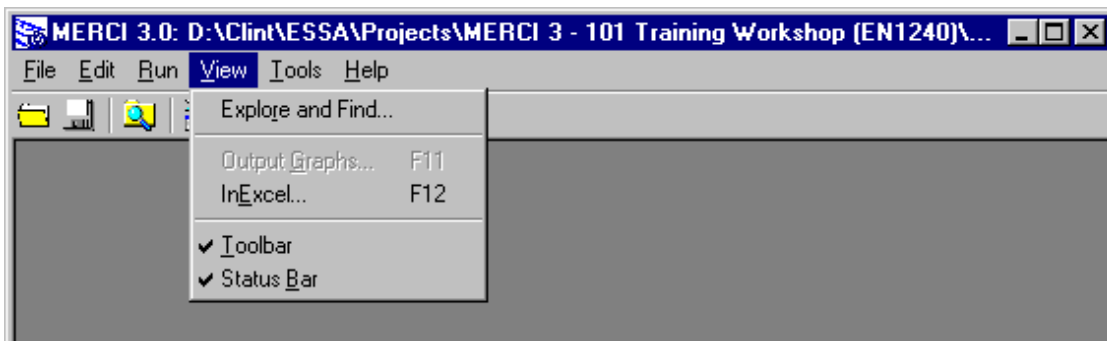
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Opening and Working with InExcel

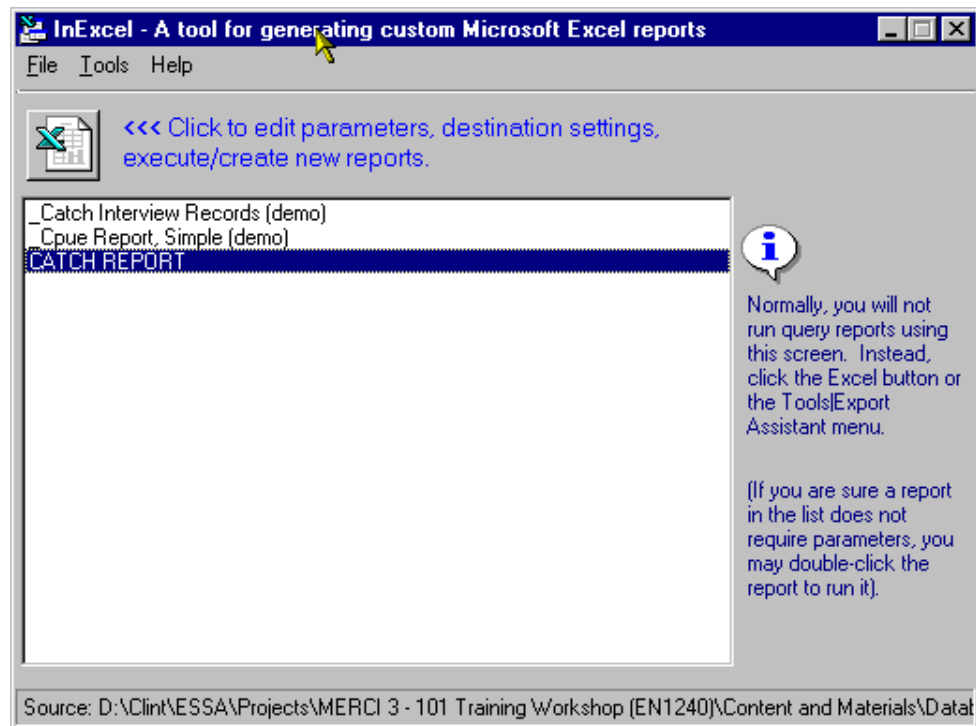
To open MERC3's InExcel reporting feature, either click the "In Excel" button :



or, use the InExcel menu.



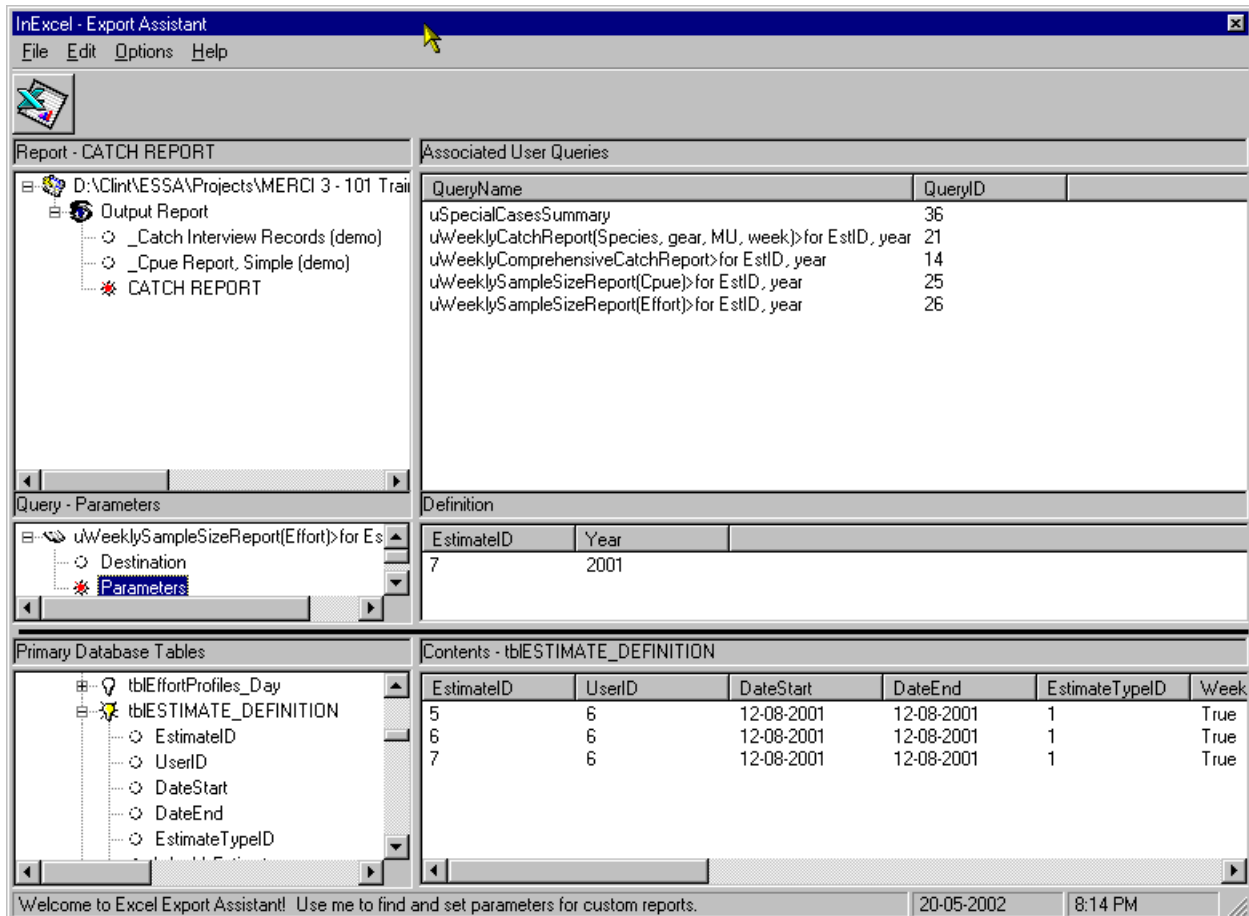
Both these actions have the same effect, and will bring up the initial list of Excel reports available in the selected database:



Double-clicking a report in the list from this screen will run the selected report *with whatever parameters and destination settings happen to be in the database*. As such, you will usually not want to run reports from this screen.



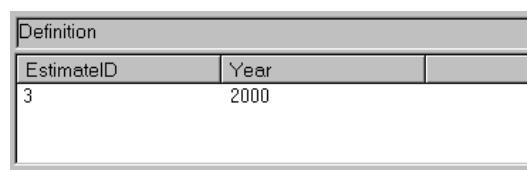
Clicking the “Edit and build reports with Export Assistant...” button provides *InExcel’s* **Export Assistant**:




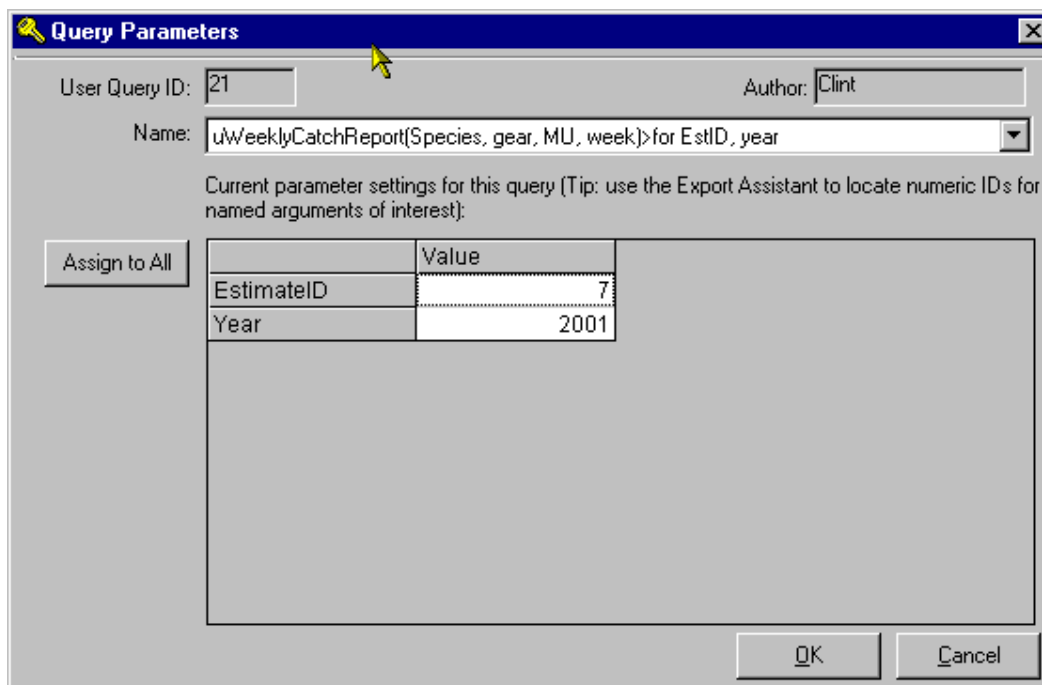
The Report pane (upper left), shows you the same list of reports you find under the simple *InExcel* report list screen. The Query list pane (upper right) shows you the list of Access database queries associated with the selected report * CATCH REPORT . By selecting any one of the individual queries in the Query list pane, you can learn their underlying **destination** and **parameter** settings using the Query specifics pane (middle left),



with values given in the Definition pane (middle right).



The most common operation you will need to perform is updating these parameters (because each batch of catch statistics has a unique ID assigned by the database). After choosing one of the queries comprising the desired report, this is achieved by selecting the parameters node  and right-clicking your mouse and selecting the Edit option:



User Query ID: 21 Author: Clint

Name: uWeeklyCatchReport(Species, gear, MU, week)>for EstID, year

Current parameter settings for this query (Tip: use the Export Assistant to locate numeric IDs for named arguments of interest):


Assign to All

Parameter	Value
EstimateID	7
Year	2001

OK Cancel

IMPORTANT TIP:

The Query Parameters screen is designed to edit parameters for individual queries, one at a time.

*It is critical that the **Assign to All**  button is pressed prior to closing this screen. This updates all other queries that belong to the selected report.

This will avoid “apples and oranges” problems

The bottom two panes are used to search for the numeric values (ids) of various parameters required by the various queries. The most notable table used for this purpose is tblESTIMATE_DEFINITION. It stores the EstimateID of different catch statistics. Use the bottom two panes to find the EstimateID associated with named estimation scenarios.

The course instructor will demonstrate navigating the Export Assistant as part of the on-screen presentation to clarify these steps. Hands-on exercises will help provide you with practice.

Export Assistant Do Nots

Unless you have completed training modules on creating your own custom InExcel reports for MERCİ (not covered in this course), **NEVER**:



- Delete a default report or a query member;
- Change or delete any system supplied queries when working directly within MERCİ’s MS Access database; or
- Change or delete a report’s template file (prefixed with “tplt” by default).

The Export Assistant is an open source component. Users are free to add new reports, update lists of available user queries, change report template files, and update destination and parameter information for the various reports. This provides maximum flexibility, and unshackles users from requiring code modifications every time they wish to change the layout of a report, or add something new. The trade-off is the possibility of accidentally deleting or modifying required components.

If you would like additional training in the use of this component, please contact Clint Alexander.

Exercise

The course instructor will lead you through the production of 3 catch reports using *InExcel* for the catch estimation exercises you completed in Module 6. We’ll quickly be able to find out whether everyone obtained the same answers!

Module 8 – When things go wrong: missing data and “estimator breakdown”



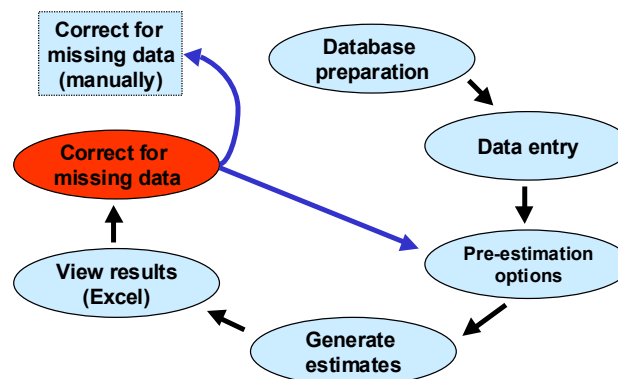
tblOUTPUT_SpecialCasesToReview

Learning Objective:

At the end of Module 8, participants will be aware of potentially serious underestimation problems that occur when one or more components of the sample survey fail to produce adequate data (due to chance sampling events or insufficient survey effort). You will learn to identify and document these special cases using MERCI’s standard InExcel catch report. Some suggestions will be provided to address these special cases of “estimator breakdown” to avoid underestimation bias. As most of these suggestions involve subjective corrections open to various biases of their own another learning objective is to emphasize the importance of adequate field survey coverage to supply the required data.



MERCI catch estimates: Step 6



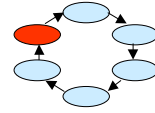
MERCİ 101

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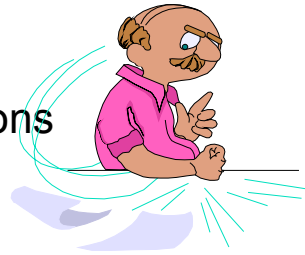
Data Hunger...



MERC3 Does Not



- Create field data
- Automatically compensate for missing statistics because of:
 - missing data
 - “bad” pre-estimation options



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Modules 5 and 6 demonstrated the manner in which catch is calculated by the MERC3 program. As you will recall, catch estimates require information gathered in three independent surveys:

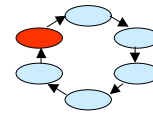
- Roving and access site catch interviews;
- Aerial overflight counts of fishing gear; and
- 24-hr “around the clock” effort surveys (also called “24-hr spirals”).

This information is combined in the equation $\hat{C} = f \cdot \hat{C}_{pue} \cdot \hat{E}$ to produce each week's, areas, gear, and species catch estimate. If the survey fails to provide statistics for **any one** of these components ($f, \hat{C}_{pue}, \hat{E} = \text{lbar}/\text{Pbar}$), a catch estimate cannot be generated.

If these cases are not individually evaluated and (some) corrected, MERCİ will underestimate the total catch⁵.



Underestimation bias!



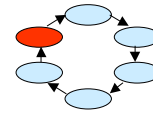
By definition:

- If any of the following are >0 then estimated catch is *likely* >0 ;
 - e_24T (Pbar denominator);
 - lbar

⁵ Though speculative, the total catch may be underestimated between 5 to 10% without correcting for these cases.



Cases to ignore, i.e., if...



Cpue=0,
e_24T=0 (Pbar denominator), **and**
lbar=0

- Catch most likely is (or is very close to) 0

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Using the resultant output reports completed as part of Module 7, the course instructor will demonstrate how to identify cases of estimator breakdown for any given estimation scenario.

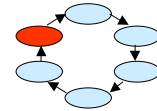
Finding “Work-arounds”

Adjusting Pre-estimation Options

Changing pre-estimation options may reduce cases of estimator breakdown.



Possible Solutions



- **Adjust pre-estimation options:**
 - increase spatial pooling
 - more observation modes to generate lbar (if other modes cover *entire* management units)

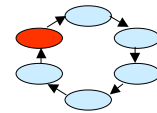


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Adjusting pre-estimation options



Be aware that...

- **excessive spatial pooling can introduce bias, i.e., among MUs...**
 - differences in catch rates
 - differences in patterns of 24-hr fishing

don't assume things “average out” (non-linear effects)
- Modes of counting gear to make lbar estimates must observe the **entire** MU

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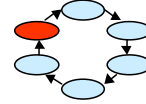
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Manual Corrections

Time permitting, the course instructor will raise the notion of manual corrections to reduce cases of estimator breakdown.



Possible Solutions



- **Manual corrections:**
 - take a previous time period’s average value for the missing statistic
 - apply knowledge or make assumptions (subjective)
 - e.g., assume constant effort ($e_{t/e_{24T}} = 1/24$);

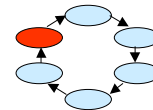
MERC3 101



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Manual corrections



Be aware that...

- **Taking previous time periods average can introduce bias, i.e., over time...**
 - catch rates change
 - patterns of 24-hr fishing change

don't assume things “average out” (non-linear effects)
- Are open to debate/criticism

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Discussion: Field Survey Improvements

Previous post-season reviews have recommended increasing sampling effort (Alexander 2000). Participants will be invited to discuss the feasibility of implementing these types of recommendations, and encouraged to document specific changes in field protocol that may help reduce the frequency of estimator breakdown and lead to greater overall accuracy in the catch estimates.



Summary of ESSA Review Recommendations (2000 Mid-Fraser program)

- **Increase (a) number of 24-hour effort monitoring sites (Sawmill Creek to Texas Creek) and (b) use roving boat patrols/if possible add access sites**
 - Recommended *minimum* sample sizes:
 - 4 overflights (even for 48hr openings)
 - 8 24-hour effort surveys
 - 30 catch interviews (per MU or MU pair)
- **Improve program stratification**
 - Do not pool catch interviews and 24-hour effort information over large spatial units
 - Introduce new management unit boundary at the Thompson River's confluence with the Fraser
- **Test assumptions: develop and implement independent random verification studies**
 - Accuracy of Cpue estimates from verbal reports?
 - Visibility bias and overflight gear counts?
 - *Correlation between effort profiles from small slices within management units vs. overall management units?

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Summary of ESSA Review Recommendations (2001 Lower- Fraser program)

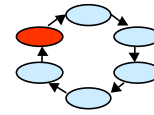
- **Collect gear type specific statistics (i.e., enter records for “pole set” and “boat set” gill nets separately, for ALL 3 survey components)**
 - Currently, no gear type differentiation, may overestimate catch by as much as 20% to 30% between Hope and Sawmill Creek (2,500 sockeye per 24hr opening)
 - Recommended *minimum* sample sizes:
 - 4 overflights (even for 48hr openings)
 - 8 24-hour effort surveys
 - 30 catch interviews (per MU or MU pair)
- **Improve program stratification**
 - Introduce 2 new management unit boundaries between Harrison and Sawmill creek
- **Test assumptions: develop and implement independent random verification studies**
 - Accuracy of Cpue estimates from verbal reports?
 - Visibility bias and overflight gear counts?
 - *Correlation between reconstructed effort profiles from repeat interviews of same harvesters vs. overall management units?

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Real world trade-offs



Option	Accuracy	Cost
• <i>Spatial pooling</i>	Low-Medium?	\$0
• <i>Previous time periods data</i>	Low-Medium?	\$0
• <i>Subjective</i>	Low-Medium???	\$0
• <i>Increase survey effort</i>	Medium-High	High (\$0000s)

location to be available and used at other locations with the challenge of how this data can be used simultaneously in a manner which ensures that different users have a consistent view of the data.

Problems with distributed databases

- Simultaneous update of shared data.
- Require data administrator and data synchronization protocol.
- Security.
- Scalability (this architecture does not work well for large numbers of distributed users on different networks is >5 or so, because of the administrative fortitude required).

Conventional Solutions

Some technology definitions

FTP

- Stands for File Transfer Protocol.
- An Internet protocol for transferring files over the Internet.
- Used to upload/download large files.
- Most easily implemented by agreeing to use a specific FTP site. Security provided optionally in form of password to FTP site.
- Access to an FTP site is very straightforward—simply enter the appropriate Internet address in a Web Browser. For example, click or type <ftp://ftp.essa.com/pub/essa> into your web browser.

VPN

- Stands for Virtual Private Network. A VPN also uses the Internet as its transport mechanism. However, it maintains the security of the data on the main internal network and provides partial or full access to all resources that are there.
- A VPN is really one or more remote nodes that provide a secure tunnel to a main central network. They give you access to files on the network through standard Windows interfaces (e.g., Windows Explorer).
- Establishing a VPN network connection requires expertise of a network administrator. (Note: Fisheries and Oceans Canada uses VPN technology. For example, if you can see a Pacific Region server volume from Lillooet, Annacis Island, or Kamloops – that’s being provided via VPN).

A conventional solution for overcoming some of the shortcomings of distributed databases involves two things:

1. Leveraging large file transfer technology (usually FTP or a VPN).
2. Assigning a database administrator to enforce a strict synchronization protocol upon all distributed data users.

Step “1” usually involves use of the Internet to gain access to a designated FTP site or network file location (VPN). FTP is exactly what it standards for – a protocol for transferring files. FTP sites can be secured, and provide a means to move large amounts of data without resorting to the need to create and courier physical media (e.g., compact disks). Most government agencies or private companies maintain an FTP site for any number of uses. The drawback to FTP or VPN file transfer is that the speed of uploading (e.g., placing files on the FTP site) and downloading them (e.g., getting them off the FTP computer and onto a local computer)

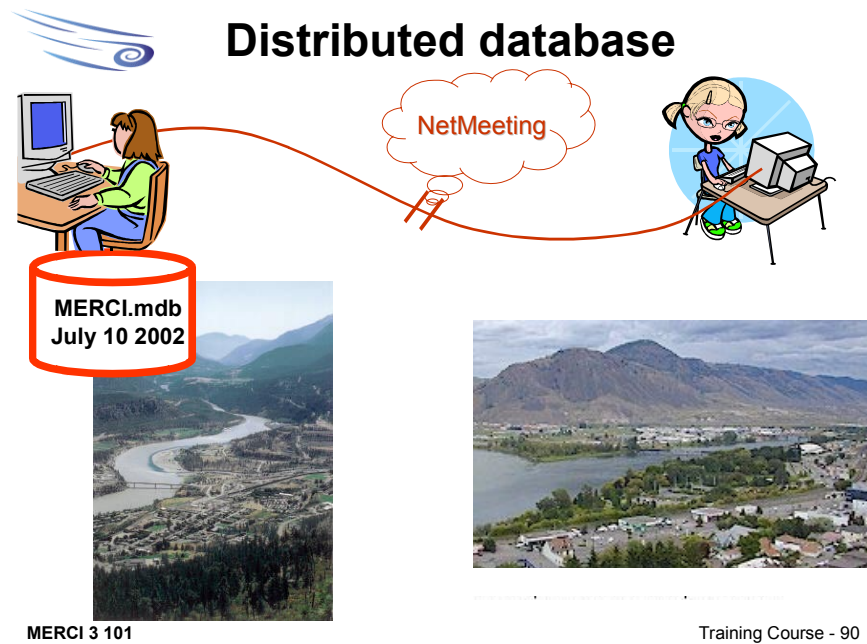
depends on the Internet connection speed, security protocols and volume of traffic on the server computer. Moving a 25MB database may take anywhere from 2 minutes on a fast connection to 3 hours over a 56K dial-up connection.

Now that users can access and exchange data, step “2” is about ensuring that various users have a consistent view of it. That is to say that everyone is working with the same data set and avoiding the tedious and *dangerous* practice of manually merging data into one or more copies of the database. This is usually performed by assigning a database administrator to take responsibility for:

- (a) enforcing a strict sign-in, sign-out policy on the database; and
- (b) tracking the database to ensure the most recent copy is always available to the users who need it (i.e., using file transfer technology discussed in step 1).

“Sign-in/sign-out” requires that all users are aware of the functions performed by other users and the relationships among their activities. The goal is to **eliminate simultaneous work on multiple copies** of the database. This requires scheduling of file transfer, data entry and catch estimation functions by the database administrator.

NetMeeting



You will notice that one of the drawbacks to distributed databases not addressed by either of the two-steps discussed above is “**simultaneous update of shared data**”. The best solution to this problem is an Internet-based application, with the database and software deployed on a server computer that is accessed through a web-browser. However, such a venture is expensive – especially when converting an existing application – and difficult to justify for a small number of users.

Real time multi-way interaction can be supplied through Microsoft’s simple application – *NetMeeting*. NetMeeting is available at no charge at <http://www.microsoft.com/windows/netmeeting/default.asp>, and provides a highly efficient way of communicating. NetMeeting allows multiple people to share information over the Internet. How is NetMeeting different from FTP or VPN technologies? The most notable difference is that it provides a simple way for individuals to **simultaneously view and operate one another’s computers** in real-time over the Internet “from the comfort” of any workstation, located anywhere. NetMeeting provides access to remote computer resources *in situ*. Second, it is considerably easier to install and configure. This negates the latency (lags) associated with operating data-driven applications over a VPN because the host computer’s resources are being used to perform the activities without the need to transmit instructions over the Internet. (NetMeeting merely transmits an image of the desktop over the Internet, which is much faster).



NetMeeting is very easy to use and once installed, can be run almost immediately with minimal up front configuration. The only requirement is Internet access and about 15 minutes of hands on training. In rare cases when a NetMeeting connection cannot be readily established a support person may be needed to provide a one-time, secure “tunnel” through a troublesome firewall.

To connect to another computer, you must ensure you have an active Internet connection and then type in the IP of the computer you wish to work with. IP is short for Internet Protocol; every computer on the Internet has one. Once you start NetMeeting, click Help | About to see your IP address listed at the bottom. If your Internet connection is permanent, this address will be fixed or will change infrequently. If you connect through a modem, the IP address will likely be different each time you connect.

Sharing Programs

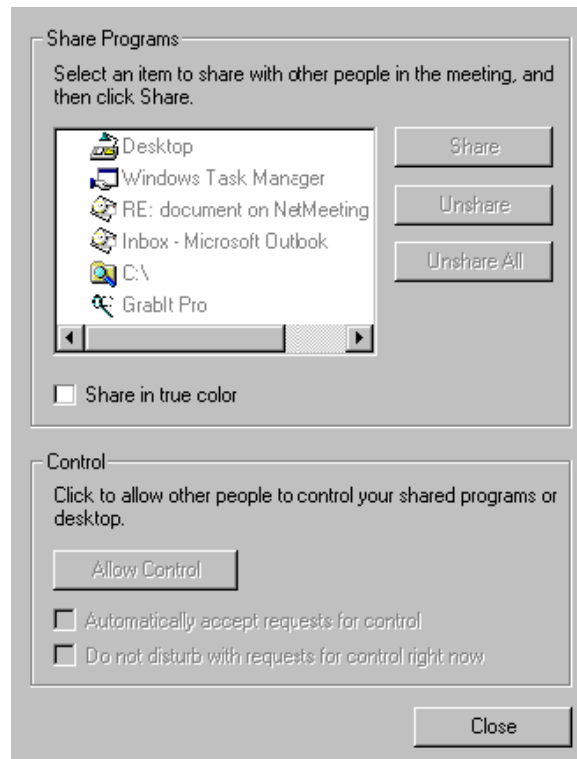
NetMeeting provides 4 main features:



Left-to-right, these are **Share**, Chat, Whiteboard and Transfer Files. The most useful feature is sharing.

You can share a program with other people – even if those people do not have that program installed on their computer. To share a program:

1. Click the Share Program button.
2. In the Sharing dialog box, click the name of the program you want to share.
3. Click Share.



If you share your computer's Desktop, you will be sharing all windows you have open. Also, once you have shared such a window, every program you start while you are still in the meeting is shared with the other participants automatically. With NetMeeting's program sharing feature, you can:

- View shared programs in a frame, which makes it easy to distinguish between shared and local applications on your desktop.
- Minimize the shared program frame and do other work if you do not need to work in the current conference program.
- Easily switch between shared programs using the shared program taskbar.
- Choose to allow one person to work in the shared program at a time.
- Approve conference participants' requests to work in the program you introduce.
- Allow or prevent others from working in a program using the Sharing dialog box.

The course instructor will discuss possible ways of using NetMeeting to assist technicians whose principal function is generating catch estimates.

Need More Help?

While I hope the MERCI 101 training course will answer most of your questions, you may have forgotten to ask some or encounter issues that were not discussed during the course. Many of your questions about MERCI can be answered by consulting the appropriate section of this manual or the MERCI Users Guide. Technical support questions can also be addressed to Clint Alexander at the Vancouver office of ESSA Technologies Ltd.:

Telephone: 604.733.2996
Fax: 604.733.4657
E-mail: calexander@essa.com

We are very interested in your comments and feedback.

Appendix I: Pre-Course Survey

MERC3: Pre-Course Survey

The purpose of this survey is to document your knowledge of the topics before the course begins. Please complete this survey and hand it in to the course instructor the morning of the first day of the course. You will be given a similar survey at the end of the course.

Please indicate your response using the following rating scale by circling the appropriate number: 1, 2, 3, 4, 5.

	not very well	2	3	4	very well
How well do you understand the field survey protocol?	1	2	3	4	5
How well do you understand how the data is used to estimate catch in MERC3?	1	2	3	4	5
How well do you understand post-season review recommendations?	1	2	3	4	5
Have you been provided with a copy of the post-season reviews?	1	2	3	4	5
Have post-season review recommendations been clearly communicated to you?	1	2	3	4	5
Do you know where to get further information on the field survey design?	1	2	3	4	5
	not very				very
Did you know that ESSA maintains a web site for MERC3 and that it is the primary way updates are obtained?	1(no)				5(yes)
Overall, how familiar are you with the MERC3 software?	1	2	3	4	5
Overall, how familiar are you with the MERC3 database?	1	2	3	4	5
Overall, how familiar are you with the MERC3 <i>InExcel</i> Tool?	1	2	3	4	5
How well do you understand the purpose and need for database preparation?	1	2	3	4	5
Do you feel capable of leading database preparation?	1	2	3	4	5
How well do you understand data entry using MERC3?	1	2	3	4	5
How well do you understand setting estimation options using MERC3?	1	2	3	4	5
How well do you understand generating catch estimates using MERC3?	1	2	3	4	5
Do you find it more efficient to produce output reports <u>without</u> using <i>InExcel</i> ?	1 (no)				5 (yes)
Overall, how comfortable are you with the steps involved with database administration?	1	2	3	4	5
Overall, how familiar are you with <i>solutions</i> to permit multiple users to more easily work with distributed databases?	1	2	3	4	5
Are you aware of the purpose of <i>tblSpecialCasesToReview</i> in MERC3's Access database?	1	2	3	4	5
How well do you understand how to identify “missing statistics” or “estimator breakdown”?	1	2	3	4	5
How well do you understand how to correct for “missing statistics” or “estimator breakdown”?	1	2	3	4	5

Appendix II: Post-Course Survey

MERC3: Post-Course Survey

The purpose of this survey is to document your knowledge of the topics after the course is over. You were given this survey at the beginning of the course. Combining the results of the surveys will help measure the degree to which the course objectives are achieved.

Please indicate your response using the following rating scale by circling the appropriate number: 1, 2, 3, 4, 5.

	not very well				very well
How well do you understand the field survey protocol?	1	2	3	4	5
How well do you understand how the data is used to estimate catch in MERC3?	1	2	3	4	5
How well do you understand post-season review recommendations?	1	2	3	4	5
Have you been provided with a copy of the post-season reviews?	1	2	3	4	5
Have post-season review recommendations been clearly communicated to you?	1	2	3	4	5
Do you know where to get further information on the field survey design?	1	2	3	4	5
	not very				very
Do you know that ESSA maintains a web site for MERC3 and that it is the primary way updates are obtained?	1(no)				5(yes)
Overall, how familiar are you with the MERC3 software?	1	2	3	4	5
Overall, how familiar are you with the MERC3 database?	1	2	3	4	5
Overall, how familiar are you with the MERC3 <i>InExcel</i> Tool?	1	2	3	4	5
How well do you understand the purpose and need for database preparation?	1	2	3	4	5
Do you feel capable of leading database preparation?	1	2	3	4	5
How well do you understand data entry using MERC3?	1	2	3	4	5
How well do you understand setting estimation options using MERC3?	1	2	3	4	5
How well do you understand generating catch estimates using MERC3?	1	2	3	4	5
Do you believe it is more efficient to produce output reports <u>without</u> using <i>InExcel</i> ?	1(no)				5(yes)
Overall, how comfortable are you with the steps involved with database administration?	1	2	3	4	5
Overall, how familiar are you with <i>solutions</i> to permit multiple users to more easily work with distributed databases?	1	2	3	4	5
Are you aware of the purpose of <i>tblSpecialCasesToReview</i> in MERC3's Access database?	1	2	3	4	5
How well do you understand how to identify “missing statistics” or “estimator breakdown”?	1	2	3	4	5
How well do you understand how to correct for “missing statistics” or “estimator breakdown”?	1	2	3	4	5

Appendix III: Evaluation Form

MERC3 101: Course Evaluation

Organization: _____ Phone: n/a (anonymous survey)

Title: n/a (anonymous survey) Fax: n/a (anonymous survey)

Responsibilities: _____ Email: n/a (anonymous survey)

1. The Course

Please indicate your response using the following rating scale by circling the appropriate number: 1, 2, 3, 4, 5. [1 = very poor (or not very well); 5 = very good (or very well)]

	Poor				Good
How valuable was the course to you? (overall)	1	2	3	4	5
How clear was the purpose and agenda of the course?	1	2	3	4	5
The on-screen lecture component was:	1	2	3	4	5
The hands-on exercises were:	1	2	3	4	5
Open discussions were:	1	2	3	4	5
The knowledge level of instructors was:	1	2	3	4	5
The quality of instruction was:	1	2	3	4	5
How well were the course objectives met?	1	2	3	4	5

For which course objectives do you require more information?

For which course objectives do you not require more information?

2. Scheduling and Materials

	Poor				Good
The schedule and pace was:	1	2	3	4	5
The audio-visual materials were:	1	2	3	4	5
The course notes and printed materials were:	1	2	3	4	5

3. Please provide, on the back of this page, any comments that would make future courses more valuable.

Appendix IV: Reading List

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