ECO GUIDE TO
Collecting Data with a PDA

Important Information

Changes in technology and science over time influence the development of software applications. Just as i-Tree Eco v6.0 offers many new features, there are several important changes in past functionality that should be noted.

Past versions of i-Tree Eco have supported the use of handheld devices, such as PDAs, for recording data during field data collection. While PDAs are no longer supported in Eco v6.0, users who are working with a new or existing Eco project that still utilizes a PDA to collect field data may use the legacy Eco v5.0 application, and then import the data into Eco v6.0. This guide will help walk you through the steps of working with Eco v5.0 and then bringing your data into Eco v6.0.

Limitations

⚠️ **Caution**

Since PDAs are not supported in Eco v6.0, some new features of the application will not apply to PDA users who must create their project in the legacy Eco v5.0. In other words, PDA users are limited to the features that are available in v5.0.

New features in i-Tree Eco v6.0 that will <u>not</u> be available to PDA users include:

- **Pre-stratification** – For users doing a **complete inventory** project, Eco v6.0 provides the opportunity to pre-stratify (subdivide) the study area into smaller units.

  (**Note:** This functionality is available for **plot-based sample** projects <u>only</u> in Eco v5.0.)

- **Data Requirements** – Eco v6.0 has been simplified to allow users to run the application with less required data to collect, if desired. In the legacy Eco v5.0, the original data requirements remain the same.

- **UK Functionality** – Expanded functionality in Eco v6.0 means that users doing a project for a study area in the United Kingdom can now do so directly in the application. (Eco v5.0 supports projects only in the United States, Australia, and Canada.)

> **Tip**
>
> Try using the mobile data collector when you collect your field data. This option is compatible with Eco v6.0 and can be used with any web-enabled device, such as a smartphone or tablet.

Recommended Steps for PDA Users

In this guide we will describe the recommended steps for working with a PDA to complete your i-Tree Eco project. We recommend that you move through the following steps in order:

- **Install i-Tree Eco**
- **Work with Eco v5.0**
  - Design Your Project
  - Create a New Project
  - Prepare PDA for Data Collection
  - Collect Field Data
  - Transfer Data from PDA
  - Save Your Project
- **Work with Eco v6.0**
  - Open Your Project
  - Edit Settings
  - Run the Eco Model
  - View Reports

Install i-Tree Eco

Installing i-Tree Eco is a two-step process. First, examine the desktop/laptop computer(s) and field data collection device(s) that you will be working with to make sure that they meet the system requirements outlined below. Second, install both of the Eco applications (v6.0 and legacy v5.0) using the i-Tree software installation options described below.

System Requirements for Desktop/Laptop Computers

Minimum hardware:
- 1.6 GHz or faster processor
- 1024 MB of available RAM
- Hard drive with at least 500 MB free space
- Monitor resolution of 1024 x 768 or greater

Software:
- Windows 7 or higher OS
- Internet Explorer 9 or higher
- Adobe Reader 9.0 or newer
- .Net Framework 4.0 or newer
- Microsoft Access 2010 Database Engine or newer

System Requirements for Field Data Collection Devices

PDAs:
- Windows Mobile 5.0-6.5 OS
- 240 x 320 screen resolution

Eco Installation

> ⚡ **Tip**
>
> i-Tree Eco v6.0 and the legacy v5.0 are <u>both</u> included in the 2017 i-Tree software download.

1 Visit www.itreetools.org to download the software, or insert the i-Tree Installation CD into your CD/DVD drive.

2 Follow the on-screen instructions to run i-Tree setup.exe. This may take several minutes depending on which files need to be installed.

3 Follow the Installation Wizard instructions to complete the installation (default location recommended).

Check for Software Updates

As the development of i-Tree continues, software updates will be available in the future.

In Eco v6.0, you can check for the latest updates at any time by clicking on the **Software Update** function of the **Support** tab.

To check for any updates in the legacy Eco v5.0, you must go to **Help** > **Check For Updates**. (**Note:** As this is a legacy version, the application included in your 2017 i-Tree software download will have been updated minimally.)

Work with Eco v5.0

The legacy Eco v5.0 continues to support the use of a PDA for data collection, which works seamlessly with the desktop application. It is customizable for your project needs, easy to use, and results in a database that is properly formatted for Eco and can be uploaded with a single click. The PDA application works with a variety of handheld devices, including PDAs, smart phones, Trimble dataloggers, etc., running Windows Mobile 5.0-6.5 operating system.

> **Tip**
>
> Use the i-Tree Eco v5.0 User's Manual for detailed guidance on designing your project, creating a new project using the legacy application, and collecting and recording field data using a PDA.

Design Your Project

i-Tree Eco provides a broad picture of the urban forest or trees in your study area. It is designed to use field data from complete inventories of trees or randomly located plots throughout a community along with local hourly air pollution and meteorological data to quantify urban forest structure, environmental effects, and value to communities.

Designing a new i-Tree Eco project requires some early decision-making and planning. You must define the boundaries of your study area, determine what type of project is most suitable for your objectives, and decide what data you will be collecting in the field.

For detailed information on designing your Eco project, please see **Phase I: Getting Started** in the i-Tree Eco v5.0 User's Manual.

Create a New Project

Once you have decided which data to collect during your inventory and appropriately designed your project, it is time to get started with the software. Creating a new i-Tree Eco project will take place directly in the legacy Eco v5.0 application.

For detailed directions on creating your Eco project, please see **Phase II: Getting Started with Eco** > **Creating a New Project** in the i-Tree Eco v5.0 User's Manual.

Prepare PDA for Data Collection

By this point, you should have planned your Eco project, chosen the data that you will collect, and created a new project. Now you are ready to prepare your device for data collection.

1   Connect your PDA to your computer.

(**Note:** Your computer must recognize your PDA. If it does not do this automatically, follow the instructions that came with the device.)

2   Open your Eco project if it is not currently open.

    a   Click on your computer's **Start button** > **(All) Programs** > **i-Tree** > **i-Tree Eco v5 (legacy)**.

    b   To open an existing project, go to **File** > **Open Project**. Navigate to the folder where your project is saved and select it. Click **Open**.

3   To open the PDA utility, go to **Tools** > **PDA Utility**.

(**Note:** When creating a new project, you can also access the PDA utility by clicking on the **PDA Utility** button of the **Creating/Configuring Inventories** window.)

4   In the pop-up window that appears, you will be asked to confirm the project that you are launching the PDA utility to access. If the project data in the window is correct, click **OK**.

5   The **i-Tree Eco PDA Field Data Collector** window will open on your screen.

6   Click **Check PDA Status** to see what software needs to be loaded on the PDA. If any components are missing, they will be shown in red and an **Install** button will appear.

7   Click **Install** to add the necessary components and follow the instructions on the screen and on the PDA.

Setting the project definitions

Once the PDA has been properly set up:

1 Click the **Project Definition** tab in the PDA utility interface. Each of the steps represented by the buttons shown on this screen must be executed. Some may be repeated later without any harm. However, once the project is set up, changes to the project definition generally should not be made.

2 **Add/Edit/Delete Survey Team Information**: This button brings up a screen that allows you to edit survey team names that will appear on the PDA during log-in.

3 **Import Plot List from Field Input Database for Project**: This option is available for **plot-based sample** projects <u>only</u>. Clicking this button brings up a screen that lists all plots created earlier in the **Creating/Configuring Inventories** > **Define Plots** window. The list of available plots must be imported so they can be selected from the list on the PDA.

   a Click the button at the bottom labeled **Import All Plots from Field Input Database**. As plots are completed, they will disappear from the lower box of uncompleted plots so you can follow the progress of your project.

      (**Note:** The plot list should be imported only once onto each PDA during the course of a project.)

4 **Add/Edit/Delete Additional Ground Cover Types**: This option is available for **plot-based sample** projects <u>only</u>. This button brings up a screen that allows you to edit the ground cover types to be included in the data collection. Ten come preloaded and the ID numbers 1-49 are reserved. You may enter up to 50 more ground cover types using the ID numbers 50-99.

Setting the project options

When you have completed each of the **Project Definition** tasks, click the **Project Options** tab to move on. The pre-defined items on the left appear as you set them under **Creating/ Configuring Inventories** and can only be changed there.

1 Under **Field Defined Items** on the right, check the **boxes** next to each option (plantable space, energy, shrub cover, and hydro) you decided to measure during **Phase I: Getting Started** > **Early Decisions to be Made** in the i-Tree Eco v5.0 User's Manual.

2 Click **Update Config File** when you are finished.

Applying the new configuration settings to the PDA

Click the **PDA** tab to begin applying the new settings to the PDA. With the PDA connected to your computer and ActiveSync or Windows Mobile Device Center running:

1 Click **Send Configuration to PDA**.

   (**Note:** Defining and sending project configuration data is typically done only once at the start of the project. This procedure will automatically clear the PDA of any existing field data.)

2 Once the project data have been sent to the PDA, click **Exit** on the PDA Desktop interface.

Collect Field Data

Field data collection can take place once your project configuration has been submitted to your PDA device. Use the i-Tree Eco v5.0 **User's Manual** (see **Phase III: Out in the Field**) to guide you as you collect and record your data.

Transfer Data from PDA

Once field data have been collected, you'll need to access that data from the desktop.

1 You must exit the Eco application on the PDA before uploading the data.

   For **plot-based sample inventories**:
   a To exit from the **Plots** menu, select **Exit** from the drop-down menu at the bottom and click **Go**.
   b On the main menu, click **Exit**.

   For **complete inventories**:
   a To exit from the **Trees** menu, click **Exit/Done**.
   b On the main menu, click **Exit**.

2 Open your Eco project if it is not currently open.

   a Click on your computer's **Start button** > **(All) Programs** > **i-Tree** > **i-Tree Eco v5 (legacy)**.

   b To open an existing project, go to **File** > **Open Project**. Navigate to the folder where your project is saved and select it. Click **Open**.

3 To open the PDA utility, go to **Tools** > **PDA Utility**.

4   In the pop-up window that appears, you will be asked to confirm the project that you are launching the PDA utility to access. If the project data in the window is correct, click **OK**.

5   The **i-Tree Eco PDA Field Data Collector** window will open on your screen with the **PDA** tab active.

6   With the PDA connected to your computer and ActiveSync working, but while the Eco PDA application is <u>not</u> running, click **Check PDA Status**.

7   Click **Retrieve Data from PDA**.

8   Click **OK** to clear completed plots from the PDA.

> ⚠️ **Caution**
>
> In some cases, it may be difficult or impossible for field crews to return their PDAs to the desktop for data transfer regularly. In this case, an advanced option is available that allows the records to be transferred via email. This option requires very careful file management procedures on the part of the data manager to ensure data integrity, and it requires advanced PDA knowledge on the part of the field crews to find and package the required data files within the PDA. If you require this function, please consult with i-Tree **Support** for suggestions and limitations of working with this option.

Save Your Project

To save your open i-Tree Eco project:

1   Click **File** > **Save Project**.

Alternatively, your open i-Tree Eco project can be saved under a new name. (**<u>Note:</u>** This feature is especially useful if you want to make alterations to your current project while maintaining the original version.)

1   Click **File** > **Save Project As**.
2   Browse to the folder where you would like to save your project.
3   Enter a name for your project.
4   Click **Save**.

The **Pack Project** option allows you to create a zip file that includes all the necessary database and project files to transfer your Eco project from one computer to another or to share the project with another user. To begin the process:

1 Click **File** > **Pack Project**.
2 Browse to the folder where you would like to save your zip file, enter a file name, and click **Save**.

The file will include the Eco project file, input database, and output (estimation) database. To unpack the project on a different computer:

1 Navigate to the folder where you saved your zip file.
2 Right-click on the zip file and extract files.

The project can now be accessed from the Eco application by opening the project file.

> **Tip**
>
> To simplify file management, extract your zipped files into a single folder!

Work with Eco v6.0

i-Tree Eco v6.0 has been developed with backwards compatibility so existing i-Tree Eco projects can be opened in the new application. This makes importing projects that were created in Eco v5.0 easy and seamless.

> **Tip**
>
> i-Tree Eco v6.0 offers a variety of support materials to help you work through the application. Take a look at the Eco v6.0 **User's Manual** or use the other **Eco Guides** for more topic-specific information.
>
> While working in Eco v6.0, use the on-screen help text in the panel on the left-hand side of the application window. This help text will provide step-by-step directions for using each button and function.

Open Your Project

To open the i-Tree Eco v6.0 application, click on your computer's **Start button** > **(All) Programs** > **i-Tree** > **i-Tree Eco v6**.

To open your existing Eco v5.0 project and convert it to the v6.0 file format:

1   Click **File** > **Open Project.**
2   Browse to the folder where you saved your project, click on the file name, and click **Open**.
3   The **Updating Project** window will appear.
4   Wait for the message in the window to read "Project database updated successfully" and click **OK**.
5   Enter a new file name and click **Save**.
6   Wait for **Converting Project File** to complete.

Edit Settings

Once you have opened your project in Eco v6.0, much of the application's functionality is available to you. You can:

- Edit your project data, adjust benefit prices, and add annual costs in the **Data** tab;
- Run the Eco model and view your results in the **Results** tab;
- Estimate what your urban forest will look like in the future by using Eco's Forecast model in the **Forecast** tab; and
- Access numerous support materials and provide feedback in the **Support** tab.

In Eco v6.0, the **Project Configuration** tab is where you define project settings, such as project name and location, define your plot sample, and stratify your study area. We do not recommend that PDA users work in the **Project Configuration** tab except to select different weather and pollution data or to post-stratify the study area.

> ⚠️ **Caution**
>
> If you would like to make changes to your project that require you to work with your PDA device and collect additional data (e.g., add new plots to your sample), you will need to work with your project in the legacy Eco v5.0 application and then convert to the v6.0 file format after data have been collected and transferred to v5.0.

Selecting weather and pollution data

In Eco v5.0, the weather and pollution data used by the model are available only for 2005. Additional weather and pollution data have been made available in i-Tree Eco v6.0. For projects in the United States, users now have nine years of data to choose from and additional weather stations.

To set your weather and pollution data:

> ⚡ **Tip**
>
> i-Tree Eco uses weather and pollution data to help estimate the ecosystem services, such as pollution removal, provided by the urban forest in your study area. The year you choose must be the same for both datasets.

1   Click on the **Project Configuration** tab.

2   Click on the **Project Definition** function.

3   Click on the **Location** tab.

4   Select the weather and pollution years that you would like to use for your analysis by choosing a year from the drop-down lists.

5   Select your weather station by clicking the **Show Map** button. In the window that appears, select the weather station that you would like to use in your analysis.

   (**Note:** Depending on data availability in the weather year you choose, certain weather stations may not be shown on the map. If there is a weather station that you know you would like to use and it does not appear on the map, you may need to change the weather year that you have selected. Otherwise, the station may not be available because it does not collect the data necessary to run the i-Tree Eco model.)

6   When you are satisfied with the project settings that you have entered, click **OK** in the top right-hand corner of the action panel.

7   Click **Cancel** if you decide to revert to all of the previous values, whether default values and/or those that you had previously entered.

Post-stratifying your study area

One of the decisions made while designing your Eco project is whether or not you will stratify your sample. With **post-stratification**, you have chosen to subdivide the study area after you collect your field data. Your Eco results will be estimated for the entire study area as well as by strata. The decision to stratify should ultimately be based on your current and future project objectives and available resources.

> **Eco Guide**
>
> Look at the **Eco Guide to Post-stratified Samples** for directions on how to create a post-stratified random sample of i-Tree Eco plots using Eco's manual plot creation function. For directions on post-stratifying a complete inventory, see the **Eco Guide to Stratifying a Complete Inventory**.

For detailed information on working with Eco v6.0, please see the i-Tree Eco v6.0 **User's Manual**. (**Note:** The User's Manual can also be accessed by going to **Support** > **User's Manual** in the application.)

Run the Eco Model

After you have converted your i-Tree Eco v5.0 project to the v6.0 file format and made your final edits, it is time to run the Eco model and get the results for your project!

Running the Eco model is a two-step process that is necessary in order to view your reports. The first step is to send your data to the i-Tree server where the Eco model will be run. The second step is to retrieve your results from the server.

First, send your data to the i-Tree server:

1   Click on the **Reports** tab.
2   Click on the **Submit Data for Processing** function.
3   Read the i-Tree End User's License Agreement and click **OK** if you consent.
4   In the **Contact Information** window, enter your personal information in the spaces provided.
5   To cinfirm your email address, enter the same email address in the spaces labeled "Email" and "Confirm." This information is critical.
6   Click **OK**.

Please be patient – model processing time depends on the number of projects that have recently been submitted to the server as well as the size of your project. You can click on the **Track & Retrieve Results** function to track your status in the queue.

When your data have been processed, an auto-generated email notifying you that the results are ready to download will be sent to the email address that you provide in the **Contact Information** window. This email will be from info@itreetools.org; please check your spam folders if you do not receive the email. Likewise, you will be notified of processing errors that require data to be submitted again. If you do not receive your results within 24 hours, please contact info@itreetools.org.

Second, retrieve your results from the i-Tree server:

1. Click on the **Reports** tab.
2. Click on the **Track & Retrieve Results** function.
3. In the **Retrieve Processed Results** window, click **OK**.
4. Please be patient while results are downloaded.

> ⚠️ **Caution**
>
> If you make changes to your project settings or add or edit your field data, you will need to send your data to the server and retrieve your results again to ensure that your changes are reflected in your reports.

View Reports

i-Tree Eco v6.0 presents model results in the **Reports** tab that include charts, tables, and a narrative, summary report. Functions that are greyed out cannot be accessed at that point. If you have not yet run the i-Tree Eco model, most of the reports, charts, and tables will not be available until after you have done so. Depending on the type of project and data collected, some analyses may not be completed.

If you are unsure whether or not you have run the Eco model, you can check the **Project Metadata** report of the **Reports** tab. This information is especially useful since you may find it necessary to run the i-Tree Eco model more than once throughout the duration of your project.

i-Tree Eco provides a wide variety of standard reports to users. For full descriptions of the available reports, please see **Phase V: Viewing Your Reports** in the i-Tree Eco v6.0 **User's Manual**.