# TEAM Climate 3.0 Monitoring Protocol Metadata

## License and Usage Rights

**Tropical Ecology, Assessment and Monitoring (TEAM) Network Data Use and Conditions**

1. INTRODUCTION. The Tropical Ecology, Assessment and Monitoring ("TEAM") Network Data Use Terms and Conditions ("Terms and Conditions") outline the TEAM Network standards for data sharing, access, authorship, citation, and restrictions of TEAM data and apply to all users of TEAM data (including TEAM data contributors when using TEAM data collected by other TEAM sites).

The TEAM Network of Conservation International funds and coordinates the systematic monitoring of biodiversity through a network of tropical field stations, to quantify and forecast changes in biodiversity at local, regional and global scales. TEAM aims to understand both the underlying dynamics of biodiversity, and the responses of biodiversity to major drivers of change, particularly changes in climate and land use/land cover. The TEAM Network members recognize that achieving this goal requires the coordination of an integrated and systematic sampling program at multiple spatial and temporal scales. Further, to maximize the utility of TEAM data for change detection and for informing the development of sound conservation strategies, rapid dissemination of TEAM data to the global scientific and conservation communities is crucial. Thus, the TEAM Network is committed to making TEAM data globally accessible to the scientific and conservation communities and to the general public.

2. TEAM NETWORK DATA ACCESS REQUIREMENTS. Access to all TEAM data is subject to requirements set forth by these Terms and Conditions to enable data providers to track usage, evaluate its impact in the community, and confirm users' acceptance of the terms of acceptable use. These requirements are standardized across the TEAM Network to provide contractual exchange of data among the Data Set Creators (defined below) within the TEAM Network and Data Users (defined below) that can be encoded into electronic form and exchanged between computers. This will allow direct access to data through a common portal once these requirements have been fulfilled. The following registration information is required directly or by proxy prior to the transference of any Data Set:

a. Name
b. Affiliation
c. Email Address
d. Full Contact Information
e. Acceptance of the below General Data Use Agreement
f. A Statement of Intended Use that is compliant with the Approved use defined below. Such statements may be submitted explicitly or made implicitly via the data access portal interface.

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**IMPORTANT: PLEASE READ CAREFULLY.** Use of the Data Set (defined below) is subject to the Terms and Conditions set forth below. By downloading, copying, or otherwise using a TEAM Data Set, the Data User (defined below) agrees to be bound by these Terms and Conditions and enters into a legally binding Agreement with the Data Set Creator ("Agreement"). By refusing to agree to the terms provided herein, the Data User is not authorized to use the Data Set.

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i. Data Set.. Digital data and its metadata provided through the data access portal interface, or through other media, including data and metadata derived from TEAM monitoring protocols, field observations, collections, laboratory analysis, camera trap images, all written, recorded, graphic, audio, visual, and other materials in any media, whether or not subject to copyright protection, or the post-processing of existing data and identified by a unique identifier issued by the TEAM Network.

ii. Third Party Data Set. Digital data and its metadata provided through the data access portal interface, or through other media, not derived from TEAM monitoring protocols, but provided by third party Data Set Creators.

iii. Data Set Identifier. A unique identifier created by the information system to be included with a Data Set for the purpose of tracking and ongoing identification.

iv. Data User. Individual to whom access to this Data Set may be granted, subject to acceptance of these Terms and Conditions by such individual and his or her immediate collaboration sphere, defined here as the institutions, partners, students and staff with whom such individual collaborates and to whom access must be granted in order to fulfill the such individual's intended use of the Data Set.

v. Data Set Creator. Individual or institution that produced the Data Set.

vi. Data Set Contact. Party designated in the accompanying metadata of the Data Set as the primary contact for the Data Set.

b. Conditions of Use

i. Purpose. The sharing and dissemination of scientific data has the potential to greatly increase communication, collaboration and synthesis within and among disciplines, and to improve the scientific foundations for conservation, and thus is fostered, supported and encouraged by the TEAM Network.

ii. License. The Data Set Creator hereby grants to the Data User a non-exclusive, royalty-free license to copy, use, and create derivative works from this Data Set, subject to the terms of this Agreement, and is sub-licensable only in accordance with the terms set forth herein, including Section 3 b. iv (Redistribution) below.

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iv. Redistribution. The Data Set is provided for use by the Data User. The metadata and this license must accompany all copies made and be available to all users of this Data Set. The Data User will not redistribute the original Data Set for purposes other than those permitted in Section 3 B. iii (Approved use).

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vi. Citation. The TEAM Data Sets are made immediately available as soon as possible after field collection; however, taxonomic identification and other quality control processes may require several months to complete. Therefore, the TEAM Data Set may undergo periodic revision and it is necessary to track Data Set versions in any derived products. Thus, the Data User agrees to properly cite the Data Set, including the Data Set Identifier, in any publications or in the metadata of any derived data products that are produced using the Data Set. Citation shall take the following general form: Creator, Year of Data Publication, Title of Data Set, Data Set Identifier.

vii. Acknowledgment. The Data User agrees to include the following acknowledgment in any publications where the Data Set contributed significantly to its content:

*"All data in this publication were provided by the Tropical Ecology Assessment and Monitoring (TEAM) Network, a collaboration between Conservation International, the Missouri Botanical Garden, the Smithsonian Institution, and the Wildlife Conservation Society, and partially funded by these institutions, the Gordon and Betty Moore Foundation, and other donors."*

In addition, the Data User agrees to include any additional acknowledgment of institutional support or specific funding awards provided in the metadata accompanying this Data Set, including those requested by the Data Set Creator, in any publications where the Data Set contributes significantly to its content.

viii. Notification. The Data User will register the citations to all publications and derivative works based on or derived from the Data Set at www.teamnetwork.org or, if the registry is not available, by sending an email message containing the complete citation to team-webmaster@teamnetwork.org. In addition, the Data User will notify the Data Set Contact when any derivative work or publication based on or derived from the Data Set is distributed. The Data User will provide the TEAM Network Office and the Data Set Contact with two reprints of any publications resulting from use of the Data Set and will provide copies, or on-line access to, any derived digital products.

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x. Termination. By accepting this Data Set, the Data User agrees to abide by the terms of this Agreement. The Data Creator and the TEAM Network shall have the right to terminate this Agreement immediately by written notice upon the Data User's breach of, or non-compliance with, any of its terms. The Data User may be held responsible for any misuse that is caused or encouraged by the Data User's failure to abide by the terms of this Agreement.

4. Disclaimer. THE ACCURACY OR COMPLETENESS OF THE CONTENTS OF ANY DATA SET, IN WHOLE OR IN PART, IS NOT GUARANTEED. ALL DATA SETS ARE MADE AVAILABLE "AS IS" WITHOUT WARRANTY OF ANY KIND, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THE DATA USER HOLDS ALL PARTIES INVOLVED IN THE PRODUCTION OR DISTRIBUTION OF THE DATA SET HARMLESS FROM DAMAGES RESULTING FROM ITS USE OR INTERPRETATION INCLUDING ANY CONSEQUENTIAL DAMAGES, PUNITIVE DAMAGES, INDIRECT DAMAGES, SPECIAL DAMAGES OR LOST PROFITS.

5. Arbitration. It is the policy of the TEAM Network to make every reasonable effort to resolve all issues or disputes that may arise under this Agreement fairly by negotiation without litigation, if practicable. Any dispute arising out of or relating to this Agreement which is not settled by agreement of the parties shall be finally settled by arbitration in accordance with the UNCITRAL Arbitration Rules in force at the time the dispute arises. Any disputes that cannot be resolved by negotiation shall be subject to arbitration using a single arbitrator. The arbitration shall take place in Washington, DC, in English, and the results of such arbitration shall be final, non-appealable, binding on each party, and enforceable in any court of competent jurisdiction. The terms and conditions of this Agreement shall be construed in accordance with the laws of the District of Columbia, without regard to any conflicts of laws principles.

6. Acknowledgement. DATA USER ACKNOWLEDGES THAT HE/SHE HAS READ AND UNDERSTANDS THIS AGREEMENT AND AGREES TO BE BOUND BY ITS TERMS. DATA USER FURTHER AGREES THAT THIS

AGREEMENT SUPERSEDES ANY PREVIOUS LICENSE, AGREEMENT, OR PROPOSAL, WHETHER WRITTEN OR ORAL, AND ANY OTHER COMMUNICATIONS RELATING TO THE SUBJECT MATTER OF THIS AGREEMENT.

7. Severability. In the event that any one or more of the provisions contained herein shall, for any reason, be held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provisions of this Agreement, but this Agreement shall be construed as if such invalid, illegal or unenforceable provisions had never been contained herein, unless the deletion of such provision or provisions would result in such a material change so as to cause completion of the transactions contemplated herein to be unreasonable.

8. Waiver. Conservation International may specifically and expressly waive any breach of this Agreement by Data User, but no such waiver shall constitute a continuing waiver of similar or other breaches. Conservation International's consent or approval of any act by Data User shall not be deemed to render unnecessary the consent to or approval of any subsequent act by Data User.

9. Entire Agreement. This Agreement constitutes the entire understanding between the parties with respect to its subject matter hereunder, is intended as a complete and exclusive statement of the terms of their agreement, and supersedes any prior or contemporaneous agreements or understandings relating to the subject matter hereunder.

10. Notices. Notice under this Agreement shall only be deemed to have been sufficiently given to Conservation International when served personally, sent by U.S. First-Class Registered or Certified Mail or by expedited delivery service with return receipt requested, addressed at the addresses set forth below.

If to Conservation International Foundation

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## General Information

Climate 3.0 Metadata Version 3.0. This is a Metadata File (**Climate 3.0-Metadata.3.0.pdf**) for the TEAM Climate 3.0 Monitoring Protocol data. Data are available for download at the TEAM Network website (www.teamnetwork.org). The purpose of this Metadata File is to provide the data user with more information to help them understand and utilize the data sets they download. Suggestions on improving the format of the Metadata File and the query output format can be sent to team-webmaster@teamnetwork.org.

## Abstract

The Tropical Ecology, Assessment and Monitoring (TEAM) Network is a program coordinated from within the Science and Knowledge Division at Conservation International (CI). The TEAM Network's mission is to monitor long-term trends in biodiversity through a network of tropical field stations, providing an early warning system on the status of biodiversity that can effectively guide conservation action. The TEAM Network conducts research through a global network of field stations in tropical and sub-tropical forests using a standardized methodology.

Yet much remains unknown about how climate change impacts the environment, especially tropical forests. Among the s ecosystems, tropical montane forests are thought to be the most sensitive to changeworld climatethey are extremely sensitive not only to changes in average temperatures but also to changes in the cloud base. As a result, climate change could have a substantial impact on the diversity and composition of tropical montane species (Pounds, Fogden et al. 1999).

The need for more climatic data from a wider range of sites is acute, especially in the tropics, where the harsh environmental effects on climatic monitoring equipment make it difficult to gather consistent data (Clark and Clark 1994; Root and Schneider 1995; IPCC 2001; Enquist 2002). Consistently gathered long-term climate data are necessary if future climatic phenomena and trends, as well as their impact on biodiversity, are to be identified and understood (WMO 1998).

The protocol described below allows TEAM field stations to gather long-term climatic data that will lead to a greatly expanded knowledge of how climate change is impacting tropical biodiversity.

Climate variables measured in this protocol are: Temperature, Relative Humidity, Photosynthetically Active Radiation (PAR), Soil Moisture, Sunshine and Diffuse Radiation, Wind and Precipitation.

## Keywords

Temperature
Relative Humidity
Photosynthetically Active Radiation (PAR)
Soil Moisture
Direct, Diffuse and Total Radiation
Wind

Precipitation
Weather Station

## TEAM Network Partner Institutions

**Tropical Ecology, Assessment and Monitoring (TEAM) Network**
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## Geographic Coverage

The TEAM Climate Monitoring Protocol (http://www.teamnetwork.org/protocols/climate) describes the spatial arrangement for climate stations at each TEAM Site. The actual locations of the climate stations are in the data file in a Datum:WGS84 format.

## Temporal Coverage

The temporal period for the TEAM Network Climate 3.0 Data Set is described below. This is the maximum temporal range. TEAM Site specific temporal ranges can be determined directly from the data.

| | |
|---|---|
| Begin | 2012-07-04 |
| End | 2017-08-29 |

## Methods Information

*DATA COLLECTION*
The weather station data logger is configured to collect samples at 5 second frequencies and then generate a data record every 5 minutes. A detailed methodology is described in the Climate Monitoring Protocol that can be found at: http://www.teamnetwork.org/protocols/climate.

*DATA RECORDING*
Data will be downloaded from the data logger and then uploaded to the TEAM database. No manual data entry will be required.

*DATA CHECKING*
Data will be regularly reviewed to ensure that the sensors and data loggers are functioning properly.

*DATA ANALYSIS*
Analyze data for daily, monthly and yearly climatic trends in temperature, relative humidity, wind speed, PAR, soil moisture, sunshine and diffuse radiation, and precipitation.

*MISCELLANEOUS*
The weather station at TEAM Site Caxiuana has been in three locations. At each location the height of the weather station has been adjusted. The height of Sampling Unit CL-CX-1-1 is 54m, CL-CX-1-1.1 is 25m, CL-CX-1-1.2 is 36m.

***DATA MANAGEMENT***

Refer to the "Data Management Protocol" and the "TEAM Monitoring Climate 3.0 Protocol" for data management topics related to the TEAM Climate 3.0 Protocol.

| Climate 3.0 Data Attribute Information | | | | | | |
|---|---|---|---|---|---|---|
| **Form Value** | **Definition** | **Data Type** | **Values List** | **Unit** | **Example** | **Empty Value** |
| **Reference ID** | Unique code used to reference different data records. | integer | None | N/A | 8046 | Required |
| **Observation Date** | Date the data was collected by the data logger. | string | None | YYYY-MM-DD | 2010-05-01 | Required |
| **Observation Time** | The time of data collection by the data logger. | string | {0-24:00} | HH:MM | 17:15 | Required |
| **Record ID** | Unique code given by the data logger to the data record collected. | integer | None | N/A | 14835 | Required |
| **Minimum Battery Voltage** | The minimum amount of battery voltage available at time of data collection. | float | {0.0-14.0} | Volts | 12.13 | Required |
| **Sensor 1 - Avg Temp** | Temperature averaged over a five minute period of five second intervals for sensor 1. | float | {-10.-50.0} | Celsius | 23.63 | Required |
| **Sensor 1 - Temp Std Deviation** | The standard deviation of the averaged temperature of sensor 1. | float | {0.0-2.0} | N/A | 0.042 | Required |
| **Sensor 1 - Relative Humidity** | Relative humidity of the area as observed by Temp/ RH sensor 1. | float | {0.0-100.0} | %RH | 95.7 | Required |
| **Sensor 2 - Avg Temp** | Temperature averaged over a five minute period of five second intervals for sensor 2. | float | {-10.-50.0} | Celsius | 23.63 | Required |
| **Sensor 2 - Temp Std Deviation** | The standard deviation of the averaged temperature for sensor 2. | float | {0.0-2.0} | N/A | 0.042 | Required |
| **Sensor 2 - Relative Humidity** | Relative humidity of the area as observed by Temp/ RH sensor 2. | float | {0.0-100.0} | %RH | 95.7 | Required |
| **Sensor 1 - Avg Solar Radiation** | The average solar radiation measured over a five minute period of five second intervals for sensor 1. | float | {0.0-100.0} | W/m2 | 17.21 | Required |
| **Sensor 1 - Solar Radiation Std Deviation** | The standard deviation of the averaged solar radiation of sensor 1. | float | {0.0-50.0} | N/A | 0.499 | Required |
| **Sensor 1 - Total Solar Radiation** | Total incoming solar radiation over the five minute period as measured from solar radiation sensor 1. | float | {0.0-1.0} | MJ/m2 | 1.00E-05 | Required |
| **Sensor 2 - Avg Solar Radiation** | The average solar radiation measured over a five minute period of five second intervals for sensor 2. | float | {0.0-1000.0} | W/m2 | 17.21 | Required |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Sensor 2 - Solar Radiation Std Deviation** | The standard deviation of the averaged solar radiation of sensor 2. | float | {0.0-50.0} | N/A | 0.499 | Required |
| **Sensor 2 - Total Solar Radiation** | Total incoming solar radiation over the five minute period as measured from solar radiation sensor 2. | float | {0.0-1.0} | MJ/m2 | 1.00E-05 | Required |
| **Rainfall** | Amount of rainfall measured by automatic tipping bucket per five minute interval. | float | {0.0-100.0} | mm | 3.048 | Required |
| **Serial Number** | Serial number of the data logger. | integer | None | N/A | 26790 | Required |
| **Program Name** | Name of the climate program used in the data logger. | string | None | N/A | CPU: VB-Climate_v1.0.CR1 | Required |
| **Operating System** | The operating system version used by the data logger. | string | None | N/A | CR1000.Std.17 | Required |
| **Tachometer - RPM** | Speed of the fan in the aspirator shield. | integer | {0-10000} | RPM | 6041 | Required |
| **Protocol Version** | The protocol version that was used to collect data. | string | None | N/A | Climate-3 | Required |
| **Sampling Unit Name** | The code given to the site where the data is collected. | string | None | N/A | CL-BBS-1 | Required |
| **Latitude** | The latitudinal spatial dimension of the climate station. | float | {0.0-90.0} | Decimal Degrees | -8.1235 | Required |
| **Longitude** | The longitudinal spatial dimension of the climate station. | float | {0.0-90.0} | Decimal Degrees | 36.4572 | Required |
| **Site Name** | The actual name of the data collection site. | string | None | N/A | Bukit Barisan | Required |
| **Data Set Creator Institution** | Institution that produced the Data Set. | string | None | N/A | Wildlife Conservation Society | Required |
| **Data Set Creator Institution** | Institution that produced the Data Set. | string | None | N/A | Eric Fegraus | Required |
| **Data Set Contact** | The primary contact for the Data Set. The Data Set Contacts email and other contact information can be found at: http://www.teamnetwork.org/about/members | string | None | N/A | Conservation International | Required |
| **Data Level** | Data Levels are currently being established for each TEAM Network product. Current datasets being distributed are Level 0 which implies that all data | string | None | N/A | Level 0 | Required |

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| | being distributed meet the minimum data standards defined in this metadata document as well as additional QA/QC rules applied to incoming data. We will expand the Data Levels and corresponding definitions as more synthetic products are developed and additional data curation occur. | | | | | |