# Use Cases

## Actors

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| --- | --- | --- |
| Type | Actor | Goal Description |
| Primary | User | Register with the system and use the system’s base functionality. |
|  | System Manager | Configure system for deployed environment. |
| Supporting | Algorithms Server | Process data collected in the system to generate predictive models. |
|  | User Data Admin | Manages integrity of the system. May be a human person or an external system. |
|  | Database | Stores data collected by system for use both in the system and outside of it. |
| Offstage | Emergency Response Agencies | Use Models and Predictions for disaster prep and warnings. |
|  | Government Officials | Use the system to create predictive models for disaster preparations and relief. |
|  | Academic Institutions | Use the system and the data it collects for academic and research purposes. |

## Use Case Descriptions

**Use Case 1:**

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| Use Case Section | Description |
| Use Case Name | Register with System |
| Goal in Context | The user creates an account to use the system |
| Scope | System |
| Level | User-Goal |
| Primary Actor | User |
| Stakeholders and Interests | All users who wish to use the system |
| Preconditions | The system is installed and running in the user’s environment |
| Success Guarantee | The user creates an account and can log into the system |
| Main Success Scenario | 1. User navigates to registration page 2. User enters registration information like email, name, and password 3. System validates email and password 4. User Data Admin creates account and displays success message to User 5. User logs in. |
| Extensions | Email is invalid  3a. System prompts user to enter valid email  Password is invalid  3b. System prompts user for valid password  Account Creation Fails  4c. System displays error to user and prompts them to start registration process over. |
| Special Requirements | Availability: Account Creation (step 4) should succeed 99% of the time |

**Use Case 2:**

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| Use Case Section | Description |
| Use Case Name | Collect Environmental Data |
| Goal in Context | The user collects real time environmental data from the system |
| Scope | System |
| Level | User-Goal |
| Primary Actor | User |
| Stakeholders and Interests | Users who wish to collect real time data for study. |
| Preconditions | The system is installed and running and the user is logged in. |
| Success Guarantee | The system displays all available real time data |
| Main Success Scenario | 1. User navigates to the data collection page 2. User enters the region for data collection 3. User selects the data to be collected 4. User selects “Collect data” 5. System collects data and saves it to database 6. System displays requested data to the User |
| Extensions | User does not enter region  2a. User leaves region field blank  4a. System displays error requesting User to enter region  User does not enter data types  3b. User leaves data fields blank  5b. System displays all available data for that region  Data Collection Fails  5c. System displays error to user  Save to Database Fails  5d. System collects data  6d. System displays data to user with database error |
| Special Requirements | Availability: Data Collection should succeed 95% of the time  Performance: Data collection should average no longer than 5s |

**Use Case 3:**

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| Use Case Section | Description |
| Use Case Name | Set an Alert |
| Goal in Context | The user configures the system to send an alert to their email if a reading meets a specified threshold |
| Scope | System |
| Level | User-Goal |
| Primary Actor | User |
| Stakeholders and Interests | Users who wish to be notified for certain data readings |
| Preconditions | The system is installed and running and the user is logged in. |
| Success Guarantee | The system is configured to send alerts when data that matches the threshold is collected |
| Main Success Scenario | 1. User navigates to home page 2. User selects create alert option 3. System displays alert creation form 4. User enters alert information, including alert threshold 5. User selects save alert 6. System saves alert 7. System sends email to user when alert threshold is reached upon data collection |
| Extensions | User Enters invalid threshold  4a System shows error around threshold and prompts user to enter a valid threshold  System fails to save Alert  7a. System displays error to user and prompts them to try again |
| Special Requirements | Availability: Alert should be sent when data reaches threshold 99.9% of the time |

**Use Case 4:**

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| Use Case Section | Description |
| Use Case Name | Configures New Sensor |
| Goal in Context | The system manager configures the system to communicate with a new sensor. |
| Scope | System |
| Level | User-Goal |
| Primary Actor | System Manager |
| Stakeholders and Interests | System Manger wishes to add new sensors to system to broaden the scope of data that can be collected  Users who wish to have more data points available to them |
| Preconditions | The system is installed and running in the System Manager’s environment, and the sensor is deployed and hooked in to the same network as the system. |
| Success Guarantee | The system can collect data from the new sensor |
| Main Success Scenario | 1. System Manager logs into system with their admin credentials 2. System Manager selects “Add New Sensor” 3. System displays sensor form 4. System Manager enters information into form 5. System Manager selects “Create Sensor” 6. System creates the sensor object and pings it for data 7. System adds new column to database and migrates data 8. System shows success message to System Manger |
| Extensions | System Manager Credentials are Invalid  1a System displays login error to System Manager  System Cannot Collect Data from New Sensor  6b. System displays data collection error to System Manager and new sensor is not added  System cannot migrate database  7c. System displays database error to System Manager and new sensor is not created |
| Special Requirements | Performance: Creating a new sensor and migrating the database should average no longer than 3m |

**Use Case 5:**

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| Use Case Section | Description |
| Use Case Name | Generate Prediction Model |
| Goal in Context | The user generates weather prediction models with the system. |
| Scope | System |
| Level | User-Goal |
| Primary Actor | User |
| Stakeholders and Interests | User wishes to view predictive models |
| Preconditions | The system is installed and running and the user is logged in and the proper data is in the database. |
| Success Guarantee | The system displays predictive models |
| Main Success Scenario | 1. User selects “Generate Model” on homepage 2. System displays model generation form 3. User selects model type and region 4. User selects “Generate Model” 5. System sends needed data to the Algorithms server 6. Algorithms server uses data to generate model and sends the model to the system 7. System displays model to the User |
| Extensions | Insufficient Data for Model Generation  5a. System displays insufficient data error and lists missing data  Algorithms Server Fail  6b. Algorithms Server sends error to System  7b. System displays generation failure error to User |
| Special Requirements | Availability: Connection to the Algorithms server should be available 99% of the time |

**NOTE:** Other Use Cases found in the use case diagram are not displayed here. This is not a comprehensive view of the system, just an example using pieces of it.