SEVENTH FRAMEWORK PROGRAMME
ICT PPP
Future Internet

ENVIR⦿FI

The Environmental Observation Web and its Service Applications within the Future Internet

FP7-284898

Collaborative project

Annex - ENVIROFI Use Case Requirements Report (WP4)

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FUTURE INTERNET PPP

SEVENTH FRAMEWORK PROGRAMME

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1 Introduction

According to the ENVIROFI methodology of how to analyze and document user requirements, this report comprises the collection of use cases that were edited and agreed within the member team of the ENVIROFI work package WP4.

WP4 provides generic use cases as an abstraction of the WP1-3 use cases. Generic hereby means abstraction form the domain-specific aspects of WP1-3. It facilitates the identification and derivation of requirements and significantly reduces the number of backward references from requirements to use cases for the sake of readability.

The report is **automatically generated** from the content of the ENVIROFI Use Case server accessible at `http://envirofi.server.de`.

The following tables provide a summary and overview description of the use cases as further documented in section 2.

Use Case	Name
UC-ENV4-fun-01-V01	Service performs algebraic and logical operation on observations
UC-ENV4-fun-02-V01	System sends alerts/notifications to users
UC-ENV4-fun-02.01-V01	Predictive alerts based upon user observations
UC-ENV4-fun-03-V01	User provides new observation(s) to the system
UC-ENV4-fun-03.01-V01	User provides new observation(s) to the system through mobile PIS
UC-ENV4-fun-03.02-V01	User provides new observation(s) to the system through web portal
UC-ENV4-fun-03.03-V01	User provides large number of new observations to the system at once
UC-ENV4-fun-04-V01	User alters existing observation(s)
UC-ENV4-fun-05-V01	User accesses the existing observations
UC-ENV4-fun-05.01-V01	System presents user with information on his/her surroundings
UC-ENV4-fun-05.02-V01	User downloads observations set from the portal
UC-ENV4-fun-05.03-V01	User interactively explores the existing observations
UC-ENV4-fun-06-V01	System urges the user to provide observation(s)
UC-ENV4-kno-01-V01	System assesses the quality of observations
UC-ENV4-kno-02-V01	System identifies the observed phenomena / environmental state
UC-ENV4-sec-01-V01	System uniquely identifies users
UC-ENV4-sec-02-V01	Support user-specific application behaviour
UC-ENV4-sec-03-V01	Observation access requiring license approval
UC-ENV4-tru-01-V01	System provides information about observation uncertainty

Table 1: List of Use Cases

Use Case	Description
UC-ENV4-fun-01-V01	In many ENVIROFI Use cases, the users decision making process can be aides by calculating a value of some algebraic or logical function of the available observations. Typically, the user may be interested in finding out (and visualizing) the regions where certain environmental conditions are met, or getting alerted in case certain conditions are met. Some examples: - Nice sailing weather: {FoI is a lake} and {wind is whithin certain limits} and {temperature is within certain limits} - drought alert: {FoI is my field} and {low humidity sensed} - trigger watering: {FoI is my field} and {low humidity sensed} and {no rain predicted in near future} - possible bacterial contamination: {FoI is a bay} and {favorable meteo conditions} and {some proxi measurements over tresholds}
UC-ENV4-fun-02-V01	In many ENVIROFI applications, the system should automatically alert user, thus triggering the further workflow. For example, the user may wish to be informed that certain conditions have been met, rather than having to regularly check the situation.
UC-ENV4-fun-02.01-V01	The system shall analyze observations reported by users (user input) in order to predict current or future attribute values of user-specific information (effect), possibly correlated to the user input. The user observations may comprise current medical observations of the user himself/herself but also environmental observations provided by the user. Examples are: - sneezing - itching eyes - mucus - coughing - observations of allergenic plants (e.g. ragweeds), mushrooms, etc. The effect information corresponds to the personal health conditions of the user. Examples are: - Headache (e.g. caused by air pressure differences) - UV exposure - Blood pressure/cardio vascular problems - rheumatism Assuming a correlation between the user input and the user-specific effect, the system shall aim at generating personalised alert information for the user. <br id="tinymce" class="mceContentBody " />

cont...

Use Case	Description
UC-ENV4-fun-03-V01	The user contributes new observation(s); after some quality assurance steps (optional), the observations are stored on a server.
UC-ENV4-fun-03.01-V01	The user contributes new observation(s); after some QA steps (optional), the observations are stored on a server.Observations are provided through "mobile Personal Information System"; position and possibly other information (sensor readings?) is added automatically
UC-ENV4-fun-03.02-V01	The user contributes new observation(s); after some QA steps (optional), the observations are stored on a server.Observations are entered one by one through web-portal.
UC-ENV4-fun-03.03-V01	The user contributes new observation(s); after some QA steps (optional), the observations are stored on a server.Large number of observations is provided by the user at once, e.g. by uploading a file to the server.
UC-ENV4-fun-04-V01	Observation records may be incomplete, or contain errors. Users should therefore have a possibility to alter the information (and meta-information) associated with observation record. Depending on the scenario, one or more of the following actions need to be allowed by the server and supported by end-user (GUI) application(s): - Alter the quality-assurance related parameters, such as QA/trust level or Uncertainty associated with the observation - Alter the time/space parameters associated with the observation - Alter the observed value (e.g. because the photography associated with observation clearly shows a different taxa)
UC-ENV4-fun-05-V01	User requests the system to present part of the observations corresponding to a query; system performs the appropriate query and makes the results accessible for the user. This can be interactively repeated as needed.
UC-ENV4-fun-05.01-V01	User moves (walks? drives?...) arround; the system informs him/her of "interesting things" in the surrounding.**Example:** User is interested in birds; the system informs him which birds could be seen in environment / which bird observations have been recently reported in environment
UC-ENV4-fun-05.02-V01	User requests the system to provide him/her with a part of the observations corresponding to a query; system performs the appropriate query and provides a result in a form suitable for offline use (e.g. an XML file)

Use Case	Description
UC-ENV4-fun-05.03-V01	User requests the system to present part of the observations corresponding to a query; system performs the appropriate query and visualizes the results. This can be interactively repeated as needed.
UC-ENV4-fun-06-V01	In addition to simply waiting for users to submit new information, system could actively solicit information from user(s). In this way, it would be possible to improve the quality of the data sets. This behaviour could be triggered by various mechanisms: • User submits observation, and system urges him/her to look for related occurences (e.g. along the food chain, or in order to estimate the geographic coverage...) - • User enters an area where a survey is currently conducted - in order to get higher density of observations • User is asked to perform the same type of observation another user recently performed at the same location - can be used for QA • User in in an area where some event occured (earthquake?) or is likely to occur (dry forest?)
UC-ENV4-kno-01-V01	The system compares the newly submitted observation with the known facts and estimates the plausibility of the report (e.g. probability of false report).Some possible tests: • Spatial probability (i.e. Does this observation fit into this region? Does it occur within the know distribution area?) • Temporal probability (i.e. Can it be observed at this time of the year?) • Comparison with common mis-identifications (i.e. Provide user with image of other types often confused with type identified - does the leaf of this species look like this?) • related occurrences (do observations in same time/space fit together?) • compatibility with environment (does observation fit into the geo/bio-physical characteristics of the area?) • quality of information previously submitted by this user • opinions of other users/experts

Use Case	Description
UC-ENV4-kno-02-V01	System analyses the multimedia, sensoric or subjective input provided as the part of observation record, identifies the observed phenomena/state and stores this additional information with the observation record.The knowledge about the possible observed phenomena/environmental states may be known to the system by means of an environmental ontology as an example..Example: user submits a photography of a plant; the system recognises the plant and stores this information.Example: user reports sneezing; system inferes the existence of alergenes
UC-ENV4-sec-01-V01	The user is "recognised" by ENVIROFI application, and able to perform actions on his/her own behalf.
UC-ENV4-sec-02-V01	ENVIROFI applications should act differently for various users. For instance, the look and feel of the applications may change; system may generate different actions (e.g. send user-specific alerts); change the data shown to the user (e.g. based on his/her position or interests); or the user may be permitted to perform certain actions (e.g. view/edit/tag certai data or edit/view own profile). Also the level of trust in user-provided information may depend on the user.
UC-ENV4-sec-03-V01	An observation provider may associate a text document reporting the license associated to an observation or observation set. Upon a user request, the license will be provided to the user for explicit approval.
UC-ENV4-tru-01-V01	Beside observation data, the system provides the associated uncertainty that can be provided/visualized in alternative or along with data. The uncertainty may depend either on data quality (e.g. precision and accuracy of a sensor), or on probabilistic results (e.g. from a model simulation).Examples: a) an user runs a Ecological Niche Model on different Climate Change scenarios to evaluate changes in species geographical distribution. The result isshown as an occurrence probability map.b) an user accesses information on air pollution coming from different sensors: a certified sensor network, and a network of low-quality home stations managed by citizen scientists. The user can visualize the data map and a layer showing the different trust degree.

Use Case	Description

Table 2: Summary of Use Cases

2 Use cases

2.1 WP4

2.1.1 Service performs algebraic and logical operation on observations

	Service performs algebraic and logical operation on observations
Use Case ID	UC-ENV4-fun-01-V01
Use Case Name	Service performs algebraic and logical operation on observations
Revision and Reference	V01; http://envirofi.server.de/servlet/is/5332/
Reference	`http://envirofi.server.de/servlet/is/5332/`
Use Case Diagram	
Status	Active
Priority of accomplishment	Must have
Goal	Support simple observations processing in ENVIROFI applications
Summary	In many ENVIROFI Use cases, the users decision making process can be aides by calculating a value of some algebraic or logical function of the available observations. Typically, the user may be interested in finding out (and visualizing) the regions where certain environmental conditions are met, or getting alerted in case certain conditions are met. Some examples: • Nice sailing weather: {FoI is a lake} and {wind is whithin certain limits} and {temperature is within certain limits} • drought alert: {FoI is my field} and {low humidity sensed} • trigger watering: {FoI is my field} and {low humidity sensed} and {no rain predicted in near future} • possible bacterial contamination: {FoI is a bay} and {favorable meteo conditions} and {some proxi measurements over tresholds}
Category	Processing
Actor	User, SW Component
Primary Actor (initiates)	User
Stakeholder	
Requested Information Resources	• Observations (e.g. on SOS servers) • Processing configuration • Processing result • Alert (optional)

	Service performs algebraic and logical operation on observations
Preconditions	It is possible to access observations (online)
Triggers	by user - e.g. for visualization; by system - e.g. for alerting
Main success scenario	- User requests the system to perform certain operations on observations. 1a. user choses the observations he/she is interested in;1b. user configures the algebraic operations to be performed on these operations - system stores the configuration for later use - system performs the stored receipt as needed, producing new observations.
Extensions	- the results are visualized immediately/shown to user - the results are made available as new observations once - the system performs the stored operation from time to time (time-triggered or event-triggered) and makes the results available as new observations - system automatically discovers the appropriate input data based on user's request (e.g. air temperature from all available sources, not just from one server choosen by user)
Alternative paths	System notifies the user when new data is available (alerting)
Post conditions	Processing result is available.
Non-functional requirements	Assure that the response times are in a range acceptable for the user. Order of magnitude = seconds if the service is used interactivly.
Validation statement	a service exists which can be easily configured to perform algebraic and logical/set operation on observations, producing new observation series on the output.
Notes	- the supported operations should include at least the basic mathematic operations (+, -, *, /), logical operations on observations, that is on spatio/temporal sets (and/intersection, or/union, ...) , comparison (>, - Typically the processing shall be triggered either by users request, by timer, or by avaliability of new observations. **Observations are events** in SWE! **Observations are result of processing** in SWE! - It is to clarify where to send the processing results, e.g. in case of alerts

	Service performs algebraic and logical operation on observations
Author and date	DHa - AIT, 2011-05-26
Includes UseCase	System sends alerts/notifications to users
Maps to Requirement	Assure sufficiently short response time
Included in UseCase	Predictive alerts based upon user observations
Abstracted from UseCase	Determine air quality from uploaded photo
	Create parameter threshold to receive personalized alerts
	Check occurrence record for plausibility
	Provide feedback on occurrences in area
	Generate Habitat Distribution
	Generate Species Distribution
	Local Interesting Information - Nature hobbyists and Advanced amateurs
	Local Interesting Information - Teachers and pupils
	Personal Exposure Report - Air Quality
	Personal Exposure Report - Air Quality alternate locales
	Provide activity pattern of user
	Display past meteorological conditions and events
	Personal Exposure Report - Meteorology
	Display predicted exposure to air pollution and pollen
	Predictive alerts based upon user observations
	Raise system alert and notify user if threshold is breached
	Threshold Alert
	Threshold Creation
	Display past exposure to air pollution and pollen
	Provide feedback on dangerous occurrence
	Display observational reports of other users
	Display health reports of other users
	Determine weather condition from uploaded photo
	Check Identifications

cont...

Service performs algebraic and logical operation on observations

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Table 3: UC-ENV4-fun-01-V01 – Service performs algebraic and logical operation on observations
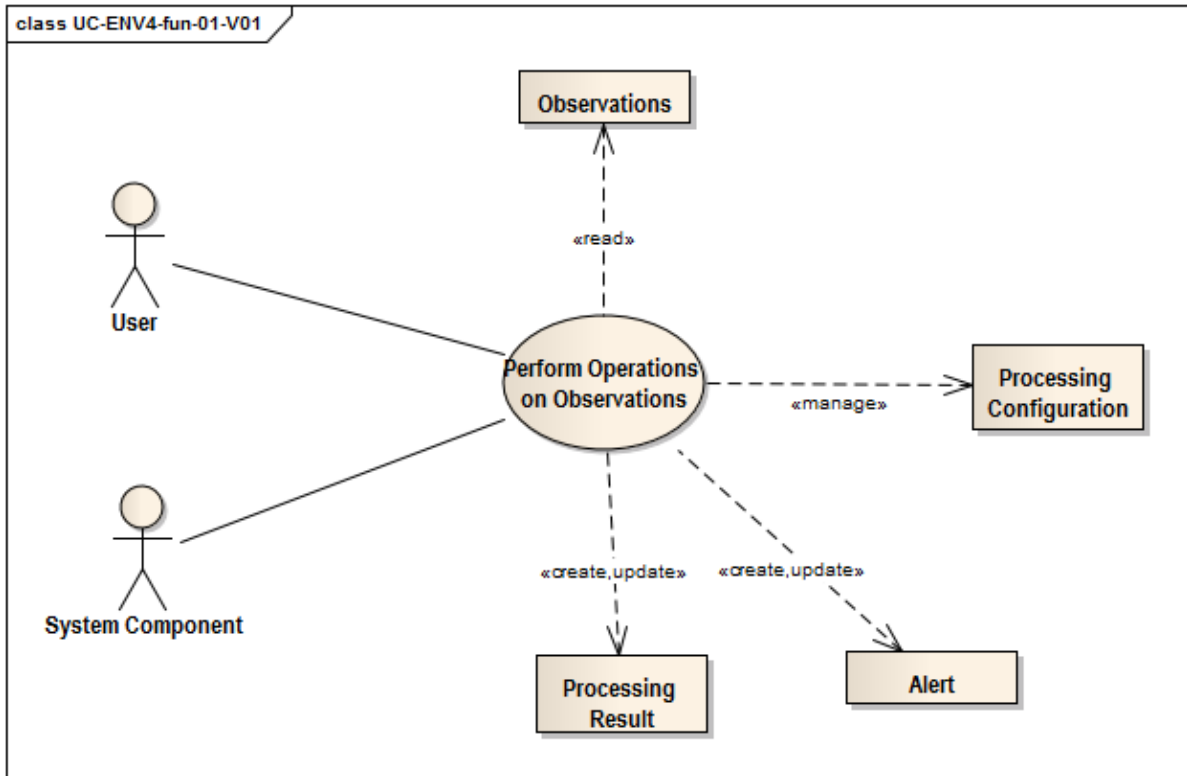
Figure 1: Use case UC-ENV4-fun-01-V01 Service performs algebraic and logical operation on observations

2.1.2 System sends alerts/notifications to users

	System sends alerts/notifications to users
Use Case ID	UC-ENV4-fun-02-V01
Use Case Name	System sends alerts/notifications to users
Revision and Reference	V01;http://envirofi.server.de/servlet/is/5353/
Reference	`http://envirofi.server.de/servlet/is/5353/`
Use Case Diagram	
Status	Active
Priority of accomplishment	Must have

System sends alerts/notifications to users

Goal	System pushes information to users
Summary	In many ENVIROFI applications, the system should automatically alert user, thus triggering the further workflow. For example, the user may wish to be informed that certain conditions have been met, rather than having to regularly check the situation.
Category	Event handling
Actor	SW component, user
Primary Actor (initiates)	SW component
Stakeholder	
Requested Information Resources	- observations/events to be monitored - where to send the alert?
Preconditions	existence of tailor-made observations; observation processing service
Triggers	by user - e.g. for visualization; by system - e.g. for alerting
Main success scenario	- User requests the system to monitor certain events - System stores the configuration for later use - System monitors the event source - System informs the user when event occured
Extensions	- Alert is sent to a service, thus triggering further processing/automated response (e.g. watering of a field). - The configuration is produced by third party (or authomatically)
Alternative paths	
Post conditions	user is informed of new event
Non-functional requirements	- Assure the alert is received by user within acceptable time (how long is "acceptable"? Beware: SMTP and many other transport protocols including TCP/IP have no support for guaranteed delivery times...) - Assure the user reacts to alert (is this needed? Some kind of workflow?)
Validation statement	- users can subscribe to events they are interested in. - users receive alerts/notifications when needed.
Notes	In SWE, all observations are events, and therefore can be used to generate alerts/notifications. However, the user is generally not interested in receiving alert whenever a sensor reading occurs. Therefore, the system needs to somehow process initial observations first, and produce a new set of events that occur only infrequently.

System sends alerts/notifications to users	
Author and date	DHa - AIT, 2011-05-26
Includes UseCase	System Notifies Relevant Personnel
Maps to Requirement	Assure sufficiently short response time
Included in UseCase	Service performs algebraic and logical operation on observations Predictive alerts based upon user observations System urges the user to provide observation(s)
Abstracted from UseCase	Create parameter threshold to receive personalized alerts Predictive alerts based upon user observations Raise system alert and notify user if threshold is breached Threshold Alert Threshold Creation

Table 4: UC-ENV4-fun-02-V01 – System sends alerts/notifications to users
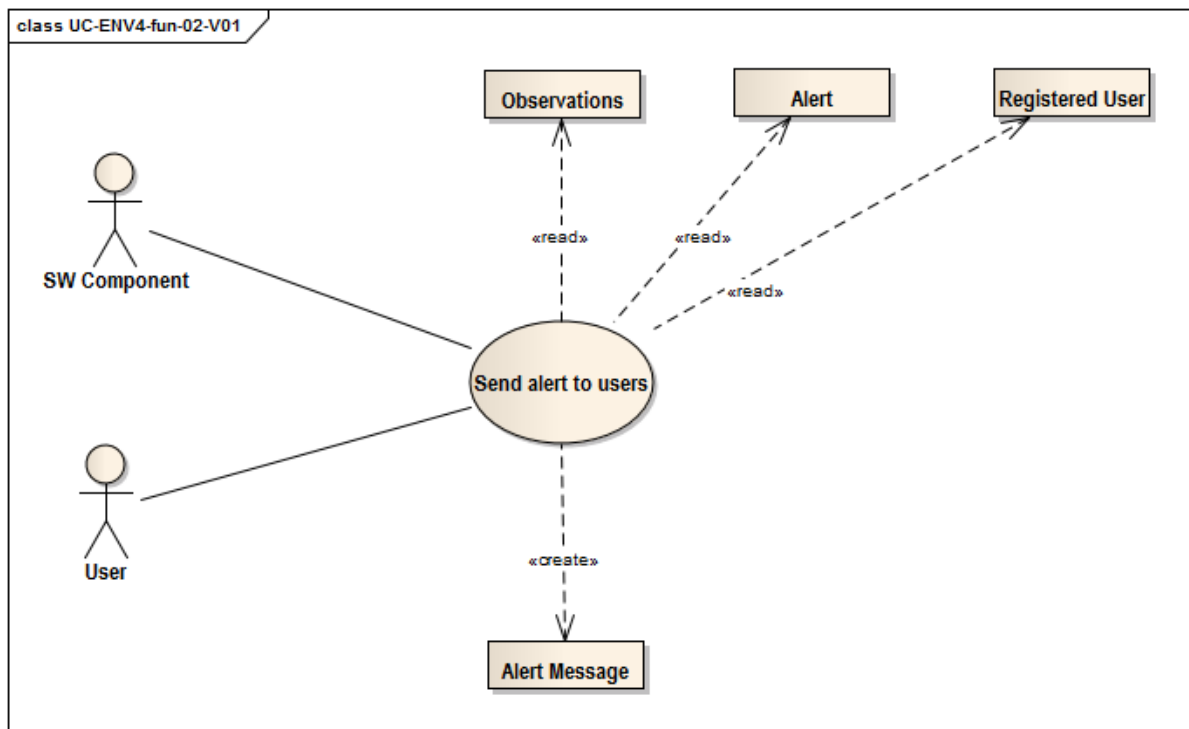

Figure 2: Use case UC-ENV4-fun-02-V01 System sends alerts/notifications to users

2.1.3 Predictive alerts based upon user observations

Predictive alerts based upon user observations	
Use Case ID	UC-ENV4-fun-02.01-V01

Predictive alerts based upon user observations

Use Case Name	Predictive alerts based upon user observations
Revision and Reference	V01; http://envirofi.server.de/servlet/is/4900/
Reference	`http://envirofi.server.de/servlet/is/4900/`
Use Case Diagram	
Status	
Priority of accomplishment	Must have
Goal	System generates alerts based on user observations
Summary	The system shall analyze observations reported by users (user input) in order to predict current or future attribute values of user-specific information (effect), possibly correlated to the user input. The user observations may comprise current medical observations of the user himself/herself but also environmental observations provided by the user. Examples are: • sneezing • itching eyes • mucus • coughing • observations of allergenic plants (e.g. ragweeds), mushrooms, etc. The effect information corresponds to the personal health conditions of the user. Examples are: • Headache (e.g. caused by air pressure differences) • UV exposure • Blood pressure/cardio vascular problems • rheumatism Assuming a correlation between the user input and the user-specific effect, the system shall aim at generating personalised alert information for the user. <br id="tinymce" class="mceContentBody " />

Predictive alerts based upon user observations

Category	
Actor	User
Primary Actor (initiates)	
Stakeholder	
Requested Information Resources	• user observation (read) • user-specific effect (read, update) • alert (create, read, update)
Preconditions	existence of user-specific effect object
Triggers	start of analysis of user observation
Main success scenario	
Extensions	
Alternative paths	
Post conditions	• user-specific effect object updated • alert object created
Non-functional requirements	• reliable generation of alert • controlled access to user-specific effect object
Validation statement	
Notes	• How are the user observations acquired and communicated to the system ? • What is the trigger to start the analysis ? • Which algorithm shall be used to analyze the user input data ? • How are the correlations between user observations and effects being conceptualised ? Statistically or based on a model ? • How shall the alert be communicated to the user ?
Author and date	
Includes UseCase	Service performs algebraic and logical operation on observations System sends alerts/notifications to users
Maps to Requirement	Access information objects based upon queries Update stored information objects
Refines UseCase	Service performs algebraic and logical operation on observations Support user-specific application behaviour System sends alerts/notifications to users
Abstracted from UseCase	Predictive Alerts Provide thresholds for alerts on the basis of historic user input

Predictive alerts based upon user observations

Table 5: UC-ENV4-fun-02.01-V01 – Predictive alerts based upon user observations

2.1.4 User provides new observation(s) to the system

	User provides new observation(s) to the system
Use Case ID	UC-ENV4-fun-03-V01
Use Case Name	User provides new observation(s) to the system
Revision and Reference	V01;http://envirofi.server.de/servlet/is/5376/
Reference	`http://envirofi.server.de/servlet/is/5376/`
Use Case Diagram	
Status	Active
Priority of accomplishment	Must have
Goal	Provide observation by user
Summary	The user contributes new observation(s); after some quality assurance steps (optional), the observations are stored on a server.
Category	Data Input
Actor	User, SW Component
Primary Actor (initiates)	User
Stakeholder	
Requested Information Resources	- Observation data and meta-information model (e.g. observation schema, ontology; depends on type of observation) - Observation storage facility (e,g, SOS server) - bacground information for plausibility checks
Preconditions	User has started ENVIROFI application; User is uniquely identified by the system (optional?)
Triggers	The user selects "provide occurrence" on mobile app.
Main success scenario	- The user chooses the type of observation (e.g. from a list, or by choosing a special application) - The user provides the information and meta-information required by observation schema - Data is uploaded to the server
Extensions	(Optional) extensions; - some of the required information may be provided automatically: time, user's position, sensor readings... - System estimates the "value" (trust, uncertainty..) of information based on user's "trust level" - System estimates the "value" of information based on automated plausibility checking mechanism - System estimates the "value" of information based on review by other users - System urges the user to improve initial record - System urges the user to perform additional observations - large number of observations is uploaded to a server at once. - other?
Alternative paths	

	User provides new observation(s) to the system
Post conditions	New occurrence records (one or more) are available in the ENVI-ROFI repository.
Non-functional requirements	Should have: Access/use conditions can be set/modified by user: • Users should have a right to decide what level of access and which IPR conditions are assigned to the data theiy submitted - within the limits set by provider. (e.g. the provider may decide to prohibit "private" records, or require special IPR conditions fo the observations maintained on his server) Must Have: Access/use conditions set/modified by service provider: • Service provider should have a possibility to limit the users choices concerning access and use conditions of the observations submitted by users. In addition to global settings, service provider may need a possibility to alter these limitations for certain records. For example, the sightings of endangered species are considered sensitive and need to be obfuscated before presenteing them to the general public. Input of observations shall usually be done either through mobile device (smart phone, tablet PC, other?), or through a fixed PC. Each of these devices has advantages and disadvantages, resulting in following requirenments: • Must have: support for various screen sizes (smart-phones have 3' screen, tablets 7-10.1', PCs >20') • Must have: support for disconnected observation gathering (network may not always be available) • Should have: support for various input methods (in particular, the NFC cards can be used as a replacement for menues; also support built-in sensors on a phone; if possible additional external sensors too) • Should have: support for slow and expensive networks (transfer textual part of the record first; upload multimedia data when on fast/inexpensive network; also possible to pre-load help information prior to field-work)

	User provides new observation(s) to the system
Validation statement	A new observation is available in the ENVIROFI repository, and owned by user that submitted it.Also see non-functional requirenments!
Notes	TODO: where are the corresponding UCs in WP2 and WP3?
Author and date	KS-UBA, 2011-07-20
Maps to Requirement	Enable limitation change for certain records Optimise battery life Provide observation privacy option Support various screen sizes Support network specific upload Provide local storage and later submission of data Support various input methods
Included in UseCase	System urges the user to provide observation(s) Observation access requiring license approval
Abstracted from UseCase	User provides new observation(s) to the system through mobile PIS Provide Occurrence - Teachers and pupils Provide Occurrence - Nature hobbyists & Advanced amateurs Provide Occurrence - Researcher User Input - Health condition User Input - Observational Reporting Upload of data from external sources Input Occurrences on Portal User provides new observation(s) to the system through web portal User provides large number of new observations to the system at once Upload of data from external sources Report environmental observation to system Determine user trustability Check observational report of user Request validation of report from other users Report health condition to system Store data Cross-check report with internal data

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User provides new observation(s) to the system

Table 6: UC-ENV4-fun-03-V01 – User provides new observation(s) to the system
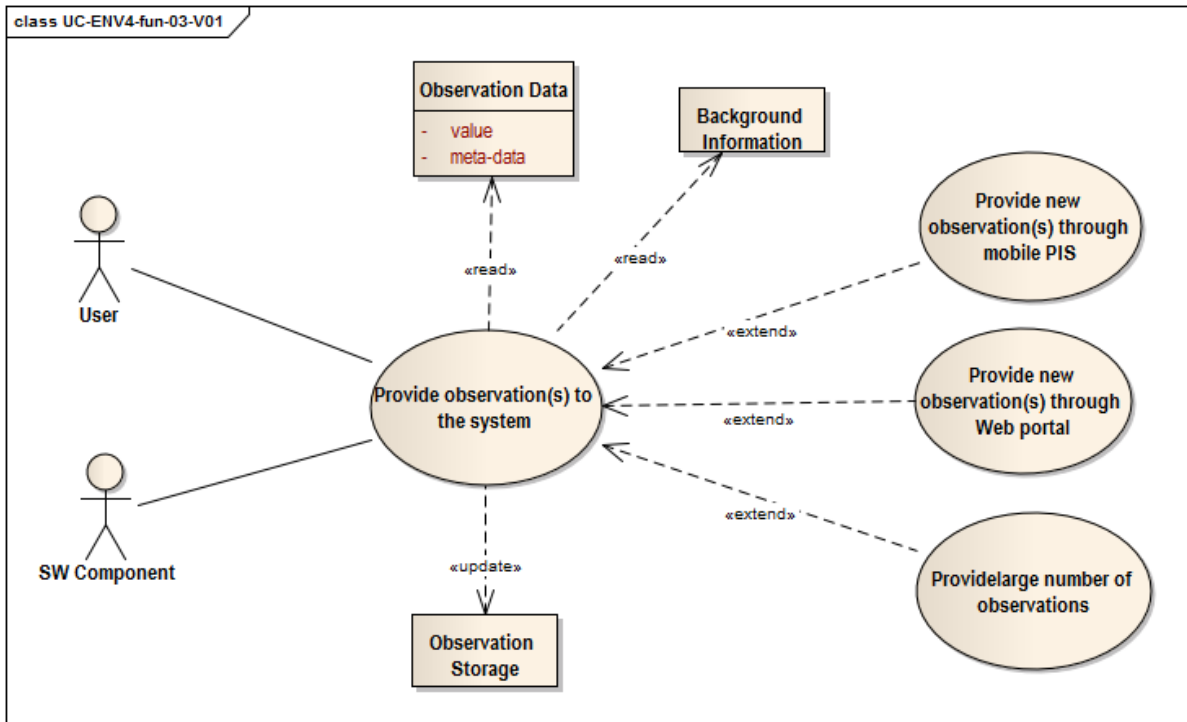
Figure 3: Use case UC-ENV4-fun-03-V01 User provides new observation(s) to the system

2.1.5 User provides new observation(s) to the system through mobile PIS

	User provides new observation(s) to the system through mobile PIS
Use Case ID	UC-ENV4-fun-03.01-V01
Use Case Name	User provides new observation(s) to the system through mobile PIS
Revision and Reference	V01; http://envirofi.server.de/servlet/is/5993/
Reference	http://envirofi.server.de/servlet/is/5993/
Use Case Diagram	
Status	Active
Priority of accomplishment	Must have
Goal	Provide observation by user

	User provides new observation(s) to the system through mobile PIS
Summary	The user contributes new observation(s); after some QA steps (optional), the observations are stored on a server.Observations are provided through "mobile Personal Information System"; position and possibly other information (sensor readings?) is added automatically
Category	Data Input
Actor	User, System
Primary Actor (initiates)	User
Stakeholder	
Requested Information Resources	• Observation data and meta-information model (e.g. observation schema, ontology; depends on type of observation) • Observation storage facility (e,g, SOS server) • bacground information for plausibility checks
Preconditions	User has started ENVIROFI application; User is uniquely identified by the system (optional?)
Triggers	The user selects "provide occurrence" on mobile app.
Main success scenario	• The user chooses the type of observation (e.g. from a list, or by choosing a special application) • The user provides the information and meta-information required by observation schema. • Time and position are added automatically • Some sensor readings may be added automatically • Data is uploaded to the server
Extensions	(Optional) extensions; • NFC tags can be used to choose the correct entry; this simplifies the task for the users. • System estimates the "value" (trust, uncertainty..) of information based on user's "trust level" • System estimates the "value" of information based on automated plausibility checking mechanism • System estimates the "value" of information based on review by other users • System urges the user to improve initial record • System urges the user to perform additional observations • other?

	User provides new observation(s) to the system through mobile PIS
Alternative paths	
Post conditions	New occurrence records (one or more) are available in the ENVI-ROFI repository.
Non-functional requirements	same as in generic UC-ENV4-fun-03-V01 "User provides new observation(s) to the system"
Validation statement	A new observation is available in the ENVIROFI repository, and owned by user that submitted it.
Notes	xlise:3788[<br id="tinymce" class="mceContentBody " />]
Author and date	DHa-AIT, 2011-09-08
Maps to Requirement	Optimise battery life Support network specific upload Provide observation privacy option Enable limitation change for certain records Support various screen sizes Provide local storage and later submission of data Support various input methods Automatically determine user's location
Refines UseCase	User provides new observation(s) to the system
Included in UseCase	System urges the user to provide observation(s)

Table 7: UC-ENV4-fun-03.01-V01 – User provides new observation(s) to the system through mobile PIS

2.1.6 User provides new observation(s) to the system through web portal

	User provides new observation(s) to the system through web portal
Use Case ID	UC-ENV4-fun-03.02-V01
Use Case Name	User provides new observation(s) to the system through web portal
Revision and Reference	V01; http://envirofi.server.de/servlet/is/6012/
Reference	`http://envirofi.server.de/servlet/is/6012/`
Use Case Diagram	
Status	Active
Priority of accomplishment	Must have
Goal	Provide observation by user
Summary	The user contributes new observation(s); after some QA steps (optional), the observations are stored on a server.Observations are entered one by one through web-portal.

User provides new observation(s) to the system through web portal

Category	Data Input
Actor	User, System
Primary Actor (initiates)	User
Stakeholder	
Requested Information Resources	- Observation data and meta-information model (e.g. observation schema, ontology; depends on type of observation) - Observation storage facility (e,g, SOS server) - bacground information for plausibility checks
Preconditions	User has started ENVIROFI application; User is uniquely identified by the system (optional?)
Triggers	The user selects "provide occurrence" on a portal
Main success scenario	- The user chooses the type of observation (e.g. from a list, or by choosing a special application) - The user provides the information and meta-information required by observation schema. - Data is uploaded to the server
Extensions	(Optional) extensions: - System aids the user by providing support for special entry types. Position may be entered trhough a map; taxa may be chosen from a list with illustrations, etc. - System estimates the "value" (trust, uncertainty..) of information based on user's "trust level" - System estimates the "value" of information based on automated plausibility checking mechanism - System estimates the "value" of information based on review by other users - System urges the user to improve initial record - System urges the user to perform additional observations
Alternative paths	
Post conditions	New occurrence records (one or more) are available in the ENVIROFI repository.
Non-functional requirements	same as in generic UC-ENV4-fun-03-V01 "User provides new observation(s) to the system"
Validation statement	A new observation is available in the ENVIROFI repository, and owned by user that submitted it.
Notes	xlise:3788[<br id="tinymce" class="mceContentBody " />]
Author and date	DHa-AIT, 2011-09-08
Maps to Requirement	Support various screen sizes Enable limitation change for certain records Provide observation privacy option Support network specific upload Optimise battery life Provide local storage and later submission of data Support various input methods

cont...

	User provides new observation(s) to the system through web portal
Refines UseCase	User provides new observation(s) to the system
Included in UseCase	System urges the user to provide observation(s)

Table 8: UC-ENV4-fun-03.02-V01 – User provides new observation(s) to the system through web portal

2.1.7 User provides large number of new observations to the system at once

	User provides large number of new observations to the system at once
Use Case ID	UC-ENV4-fun-03.03-V01
Use Case Name	User provides large number of new observations to the system at once
Revision and Reference	V01; http://envirofi.server.de/servlet/is/6025/
Reference	`http://envirofi.server.de/servlet/is/6025/`
Use Case Diagram	
Status	Active
Priority of accomplishment	Must have
Goal	Provide observation by user
Summary	The user contributes new observation(s); after some QA steps (optional), the observations are stored on a server.Large number of observations is provided by the user at once, e.g. by uploading a file to the server.
Category	Data Input
Actor	User, System
Primary Actor (initiates)	User
Stakeholder	
Requested Information Resources	• Observation data and meta-information model (e.g. observation schema, ontology; depends on type of observation) • Observation storage facility (e,g, SOS server) • background information for plausibility checks
Preconditions	User has started ENVIROFI application; User is uniquely identified by the system (optional?)
Triggers	The user selects "upload a file with observations" on a portal
Main success scenario	• The user provides a file with all observations • User provides additional meta-information on these observations (if needed - ideally the file should be self-descriptive) • Data is uploaded to the server

	User provides large number of new observations to the system at once
Extensions	(Optional) extensions: • System estimates the "value" (trust, uncertainty..) of information based on user's "trust level" • System estimates the "value" of information based on automated plausibility checking mechanism • System estimates the "value" of information based on review by other users • System urges the user to improve initial records (probably not feasible)
Alternative paths	
Post conditions	New occurrence records are available in the ENVIROFI repository.
Non-functional requirements	same as in generic UC-ENV4-fun-03-V01 "User provides new observation(s) to the system"
Validation statement	New observations are available in the ENVIROFI repository, and owned by user that submitted it.
Notes	UC-ENV2.A-PSM-02.01-V02 Display current exposure to air pollution and pollen
Author and date	DHa-AIT, 2011-09-08
Maps to Requirement	Enable limitation change for certain records Provide observation privacy option Support network specific upload Optimise battery life Provide local storage and later submission of data Support various input methods Support various screen sizes
Refines UseCase	User provides new observation(s) to the system

Table 9: UC-ENV4-fun-03.03-V01 – User provides large number of new observations to the system at once

2.1.8 User alters existing observation(s)

	User alters existing observation(s)
Use Case ID	UC-ENV4-fun-04-V01
Use Case Name	User alters existing observation(s)
Revision and Reference	V01; http://envirofi.server.de/servlet/is/4245/
Reference	`http://envirofi.server.de/servlet/is/5405/`
Use Case Diagram	
Status	Active
Priority of accomplishment	Must have

	User alters existing observation(s)
Goal	Alter the observations stored on the service
Summary	Observation records may be incomplete, or contain errors. Users should therefore have a possibility to alter the information (and meta-information) associated with observation record. Depending on the scenario, one or more of the following actions need to be allowed by the server and supported by end-user (GUI) application(s): - Alter the quality-assurance related parameters, such as QA/trust level or Uncertainty associated with the observation - Alter the time/space parameters associated with the observation - Alter the observed value (e.g. because the photography associated with observation clearly shows a different taxa)
Category	
Actor	User, SW Component
Primary Actor (initiates)	User or automated QA service
Stakeholder	
Requested Information Resources	- observation data and meta-information model - Observation records; - optional: additional background information
Preconditions	User is logged-in; observations are available on the service
Triggers	
Main success scenario	The user has successfully modified and stored an existing observation record
Extensions	- automated and semi-automated record modifications (e.g. supported by some intelligent service) - Alter a group of related observations, rather than working on each record serially
Alternative paths	
Post conditions	A modified observation is available on the server.
Non-functional requirements	- Overwriting of existing observations is often considered bad practice => system needs to support some kind of observation versioning. - it may be necessary to syncronize records over several services (tbd)

User alters existing observation(s)	
Validation statement	• Alter existing record or group of records • Check that altered records are available on the server • optional: check consistence over a group of syncronized servers.
Notes	User may be a human user or a specialized service. It is unlikely that a generic service capable of improving/modifying any type of observation can be developed within this project.
Author and date	Dha_AIT, 2011-08-19
Abstracted from UseCase	Administrate "my" Occurrences on Portal Check occurrence record for plausibility Edit data and information Provide Feedback on Occurrences on Portal Provide Further Knowledge on Habitats and Species on Portal Provide feedback on occurrences in area Provide identification for image Provide identification for sound Validate Occurrence - Researcher Edit provided data Edit data

Table 10: UC-ENV4-fun-04-V01 – User alters existing observation(s)

2.1.9   User accesses the existing observations

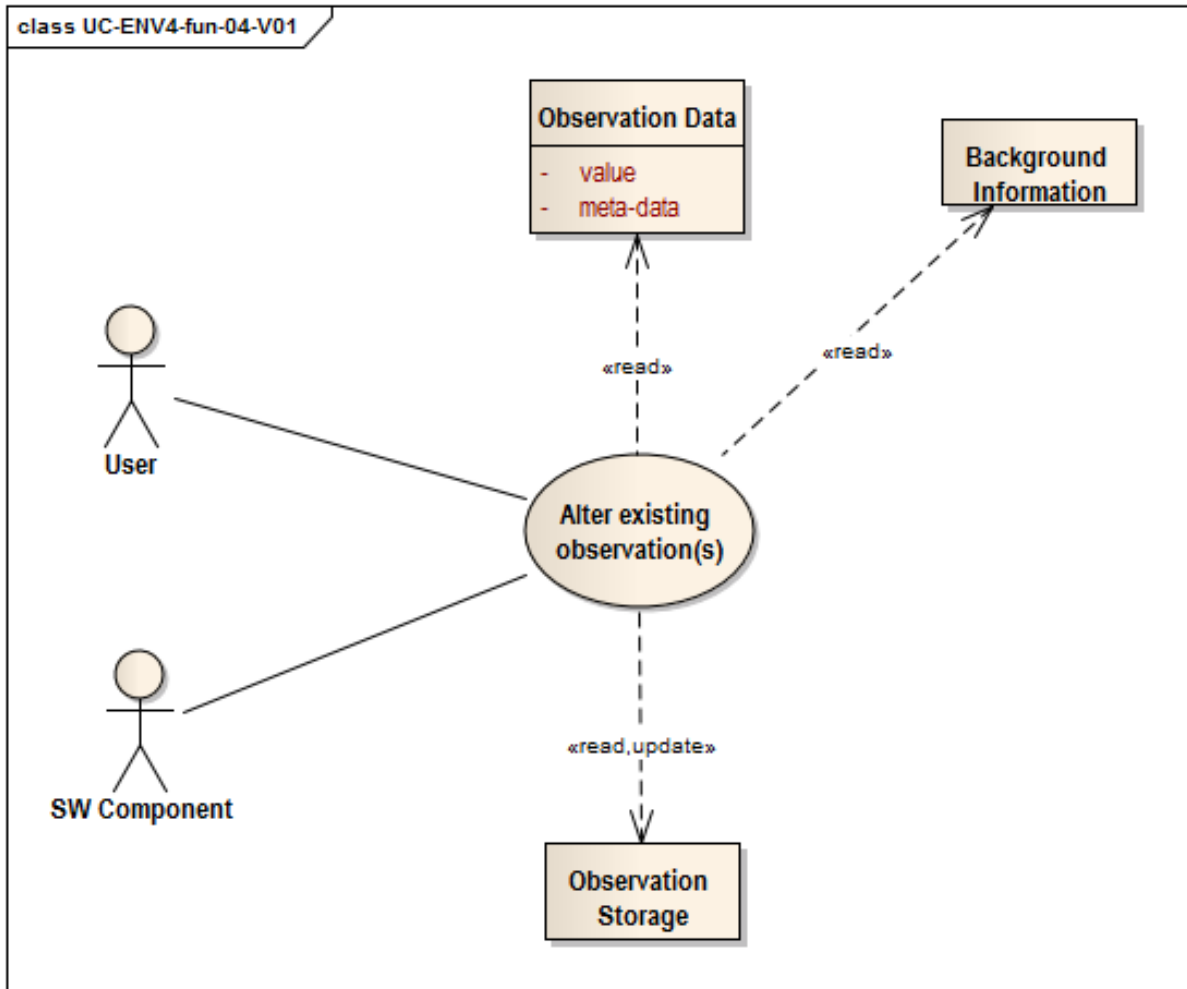| User accesses the existing observations	
Use Case ID	UC-ENV4-fun-05-V01
Use Case Name	User accesses the existing observations
Revision and Reference	V01; http://envirofi.server.de/servlet/is/5696/
Reference	`http://envirofi.server.de/servlet/is/5696/`
Use Case Diagram	
Status	
Priority of accomplishment	
Goal	Assure user can choose the observations he/she is interested in and present them in appropriate way
Summary	User requests the system to present part of the observations corresponding to a query; system performs the appropriate query and makes the results accessible for the user. This can be interactively repeated as needed.

Figure 4: Use case UC-ENV4-fun-04-V01 User alters existing observation(s)

	User accesses the existing observations
Category	
Actor	User, SW Component (e.g. ENVIROFI application)
Primary Actor (initiates)	User
Stakeholder	
Requested Information Resources	• observations (e.g. one or more SOS services with observation offerings) • query • cartographic materials (background)
Preconditions	user can find the observation sources
Triggers	
Main success scenario	• User chooses the source(s) of observations he/she is interested in • User chooses the delivery method for the data • User limits the query as needed (e.g. in time, space, other?) • system provides the user with the result set • User can view the steps 1-3 and refine the response

User accesses the existing observations

Extensions	• User downloads the data for offline examination/processing • User views/explores the data online • User stores the configuration so that the visualization can be easily recalled later • System automatically updates the information presented to user (typically because users's position changed, or because new observations have been uploaded, or because the time passes...) • User forwards the data to processing service • forwards the current configuration to processing service
Alternative paths	
Post conditions	User accesses the observations he/she is interested in, can continue with refinement

Non-functional requirements	Privacy/Ethical: Assure the observations shown to user are in-line with privacy/ethical guidelines.
	    • In some cases the user may only be allowed to see aggregates, sensitive part of the observation record may not be shown at all, or the spatial/temporal information may need to be altered before passing the data
	
	Response times: Assure the response times are in a range acceptable for the user.
	    • Generally couple of seconds for returning the data set, well under 1 sec for GUI acknowledging the user's actions.

Validation statement	User can access the observations he/she is interested in, can continue with refinement
Notes	
Author and date	
Includes UseCase	System presents user with information on his/her surroundings
Maps to Requirement	Assure sufficiently short response time Provide User Interface with Location selection. Discovery Mediation Compliance with GEO/GEOSS specifications Compliance with INSPIRE specifications
Included in UseCase	System provides information about observation uncertainty
Abstracted from UseCase	Local Interesting Information - Teachers and pupils Local Interesting Information - Nature hobbyists and Advanced amateurs Get local and regional check lists - Researcher Shellfish and Finfish Aquaculture Regulator Dashboard Shellfish and Finfish Aquaculture End User Bulletin Marine Renewable Energy Site Exploration and Discovery Discovery and View on Portal View oil drift prediction View effects prediction Access data Download data to mobile device Check availability of data on system server Store data on system server

User accesses the existing observations

Table 11: UC-ENV4-fun-05-V01 – User accesses the existing observations
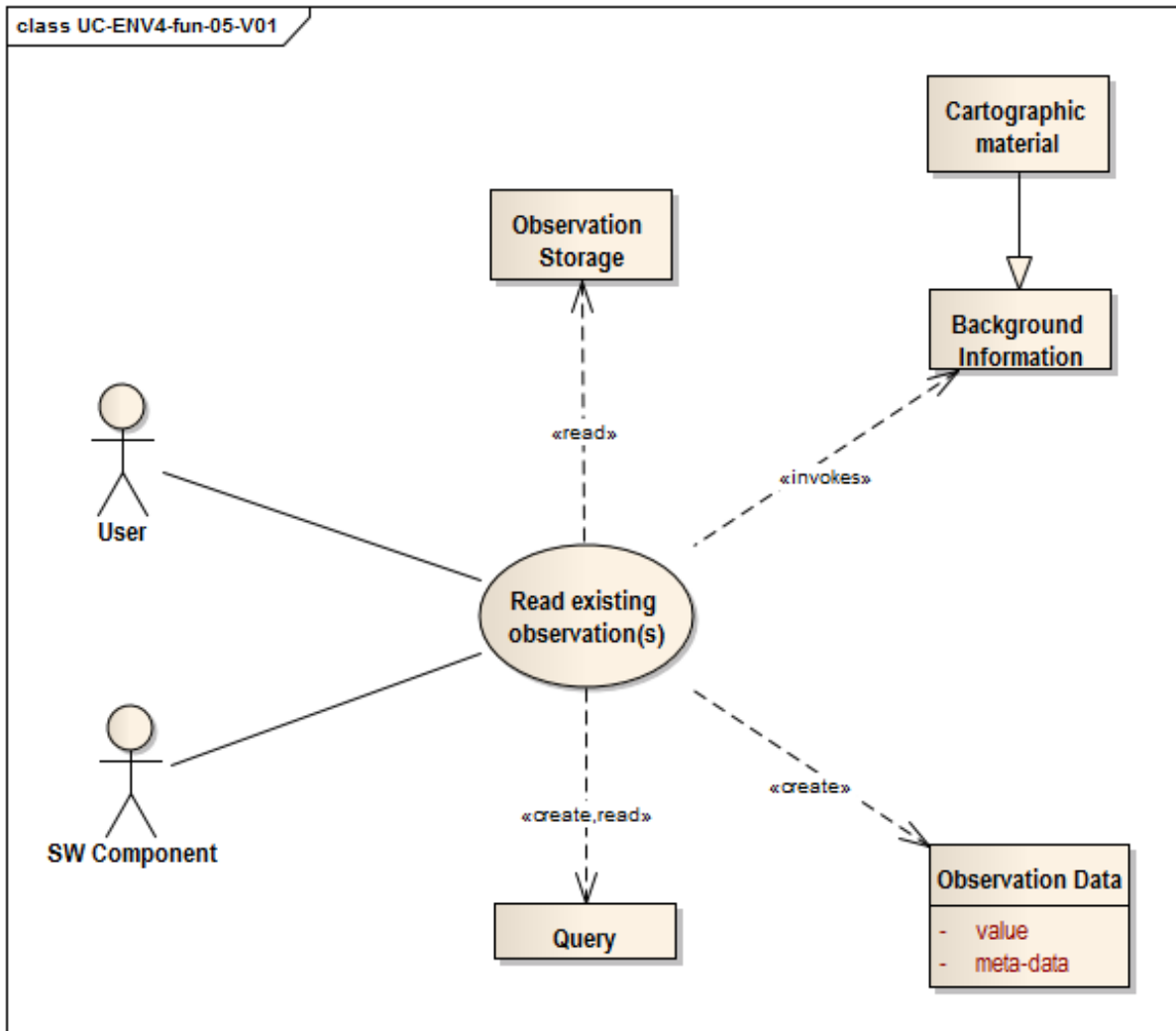
Figure 5: Use case UC-ENV4-fun-05-V01 User accesses the existing observations

2.1.10 System presents user with information on his/her surroundings

	System presents user with information on his/her surround-ings
Use Case ID	UC-ENV4-fun-05.01-V01
Use Case Name	System presents user with information on his/her surroundings
Revision and Reference	V01; http://envirofi.server.de/servlet/is/5767

<div align="right">cont...</div>

	System presents user with information on his/her surroundings
Reference	`http://envirofi.server.de/servlet/is/5767/`
Use Case Diagram	
Status	
Priority of accomplishment	Must have
Goal	Assure user can choose the observations he/she is interested in and present them in appropriate way
Summary	User moves (walks? drives?...) arround; the system informs him/her of "interesting things" in the surrounding.**Example:** User is interested in birds; the system informs him which birds could be seen in environment / which bird observations have been recently reported in environment
Category	
Actor	User, ENVIROFI applicaiton/system
Primary Actor (initiates)	User
Stakeholder	
Requested Information Resources	- observations (e.g. one or more SOS services with observation offerings) - cartographic materials (background) - user's interests (profile?)
Preconditions	user is known to the system
Triggers	
Main success scenario	- User chooses the source(s) of observations he/she is interested in (coudl be stored in his/her profie) - User chooses how he/she wants to be informed. - system presents the interesting information (repeatedly)
Extensions	- Presentation of results could continuous (e.g. on a map, within augmented reality viewer). However, the system could also send alerts whenever the user comes in vicinity of some PoI, or direct the user from PoI to PoI - makes more sense in the case PoIs are rare. - The system may be asked to present the results until further notice, until certain time passes, or until the user leaves the AoI.

	System presents user with information on his/her surroundings
Alternative paths	
Post conditions	Useris is informed of the PoIs.
Non-functional requirements	**Privacy/Ethical**: Assure the observations shown to user are in-line with privacy/ethical guidelines. • In some cases the user may only be allowed to see aggregates, sensitive part of the observation record may not be shown at all, or the spatial/temporal information may need to be altered before passing the data **energy optimization**: minimize the energy consumption of the applicaiton • This UC typically runs on small batery powered devices. It is important that the applicaiton does not significantly shorten the time device can run with one batery charging - othervise we risk loosing users. **Response times**: Assure the response times are in a range acceptable for the user. • Generally couple of seconds for returning the data set, well under 1 sec for GUI acknowledging the user's actions.
Validation statement	User receives the information on PoIs in his/her environment
Notes	This is a special case of user exploring the existing information where temporal & spatial part of the query is automatically generated by the user's device (GPS, clock). However, the possibility that system inform the user is new/specific to this UC.
Author and date	
Maps to Requirement	Optimise battery life
Included in UseCase	User accesses the existing observations User downloads observations set from the portal User interactively explores the existing observations
Abstracted from UseCase	Local Interesting Information - Nature hobbyists and Advanced amateurs Local Interesting Information - Teachers and pupils

Table 12: UC-ENV4-fun-05.01-V01 – System presents user with information on his/her surroundings

2.1.11 User downloads observations set from the portal

	User downloads observations set from the portal
Use Case ID	UC-ENV4-fun-05.02-V01
Use Case Name	User downloads observations set from the portal
Revision and Reference	V01; http://envirofi.server.de/servlet/is/6056
Reference	`http://envirofi.server.de/servlet/is/6056/`
Use Case Diagram	

User downloads observations set from the portal

Status	
Priority of accomplishment	Must have
Goal	Assure user can discover observations, and store them on his/her own system for later use.
Summary	User requests the system to provide him/her with a part of the observations corresponding to a query; system performs the appropriate query and provides a result in a form suitable for offline use (e.g. an XML file)
Category	
Actor	User, ENVIROFI applicaiton/system
Primary Actor (initiates)	User
Stakeholder	
Requested Information Resources	- observations (e.g. one or more SOS services with observation offerings) - cartographic materials (background)
Preconditions	user can find the observation sources
Triggers	
Main success scenario	- User chooses the source(s) of observations he/she is interested in - User limits the query as needed (e.g. in time, space, other?) - User decides how the data should be made available (file format; send per e-mail or download from the web, etc) - system provides the requested data set
Extensions	- User stores the configuration so that the request can be easily repeated later - system stores the data set as it was generated now (for later audits) - system makes the data available to processing service
Alternative paths	
Post conditions	User has obtained the requested data set
Non-functional requirements	Privacy/Ethical: Assure the observations shown to user are in-line with privacy/ethical guidelines. - In some cases the user may only be allowed to see aggregates, sensitive part of the observation record may not be shown at all, or the spatial/temporal information may need to be altered before passing the data Response times: Assure the response times are in a range acceptable for the user. - Generally couple of seconds for returning the data set, well under 1 sec for GUI acknowledging the user's actions.

	User downloads observations set from the portal
Validation statement	User has obtained the requested data set; the data is in correct form and corresponds to the query conditions.
Notes	
Author and date	DHa-AIT, 2011-09-08
Includes UseCase	System presents user with information on his/her surroundings
Maps to Requirement	Assure sufficiently short response time Provide User Interface with Location selection. Access mediation
Abstracted from UseCase	Access data Download data to mobile device Check availability of data on system server Store data on system server Retrieve and Display Data

Table 13: UC-ENV4-fun-05.02-V01 – User downloads observations set from the portal

2.1.12 User interactively explores the existing observations

	User interactively explores the existing observations
Use Case ID	UC-ENV4-fun-05.03-V01
Use Case Name	User interactively explores the existing observations
Revision and Reference	V01; http://envirofi.server.de/servlet/is/6041/
Reference	`http://envirofi.server.de/servlet/is/6041/`
Use Case Diagram	
Status	
Priority of accomplishment	Must have
Goal	Assure user can discover observations and present them in appropriate way
Summary	User requests the system to present part of the observations corresponding to a query; system performs the appropriate query and visualizes the results. This can be interactively repeated as needed.
Category	
Actor	User, ENVIROFI applicaiton/system
Primary Actor (initiates)	User
Stakeholder	
Requested Information Resources	- observations (e.g. one or more SOS services with observation offerings) - cartographic materials (background)

User interactively explores the existing observations

Preconditions	user can find the observation sources
Triggers	
Main success scenario	- User chooses the source(s) of observations he/she is interested in - User chooses the visualization method - User limits the query as needed (e.g. in time, space, other?) - system presents the result - User can choose steps 1-3 and refine the presented results
Extensions	- User downloads the data for offline examination/processing - User stores the configuration so that the visualization can be easily recalled later - System automatically updates the information presented to user (typically because users's position changed, or because new observations have been uploaded, or because the time passes...) - User forwards the data to processing service - forwards the current configuration to processing service
Alternative paths	
Post conditions	User visualizes the observations he/she is interested in, can continue with refinement
Non-functional requirements	Privacy/Ethical: Assure the observations shown to user are in-line with privacy/ethical guidelines. - In some cases the user may only be allowed to see aggregates, sensitive part of the observation record may not be shown at all, or the spatial/temporal information may need to be altered before passing the data Response times: Assure the response times are in a range acceptable for the user. - Generally couple of seconds for returning the data set, well under 1 sec for GUI acknowledging the user's actions.
Validation statement	User visualizes the observations he/she is interested in, can continue with refinement
Notes	
Author and date	DHa-AIT, 2011-09-08
Includes UseCase	System presents user with information on his/her surroundings
Maps to Requirement	Provide User Interface with Location selection. Assure sufficiently short response time
Abstracted from UseCase	Shellfish and Finfish Aquaculture Regulator Dashboard Shellfish and Finfish Aquaculture End User Bulletin View effects prediction View oil drift prediction Discovery and View on Portal Marine Renewable Energy Site Exploration and Discovery Retrieve and Display Data

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User interactively explores the existing observations

Table 14: UC-ENV4-fun-05.03-V01 – User interactively explores the existing observations

2.1.13 System urges the user to provide observation(s)

	System urges the user to provide observation(s)
Use Case ID	UC-ENV4-fun-06-V01
Use Case Name	System urges the user to provide observation(s)
Revision and Reference	V01; http://envirofi.server.de/servlet/is/5763
Reference	`http://envirofi.server.de/servlet/is/5763/`
Use Case Diagram	
Status	
Priority of accomplishment	Should have
Goal	Assure the system can solicit additional information when needed
Summary	In addition to simply waiting for users to submit new information, system could actively solicit information from user(s). In this way, it would be possible to improve the quality of the data sets. This behaviour could be triggered by various mechanisms: • User submits observation, and system urges him/her to look for related occurences (e.g. along the food chain, or in order to estimate the geographic coverage...) - • User enters an area where a survey is currently conducted - in order to get higher density of observations • User is asked to perform the same type of observation another user recently performed at the same location - can be used for QA • User in in an area where some event occured (earthquake?) or is likely to occur (dry forest?)
Category	
Actor	User, System
Primary Actor (initiates)	System
Stakeholder	
Requested Information Resources	• Observation gathering needs (read) • Notification to the user (create)
Preconditions	system "feels" the need and opportunity for observation gathering
Triggers	user submitts observation
Main success scenario	• System becomes aware of the need/opportunity to gather observations • System notifies the user • User gathers & submits new observation

	System urges the user to provide observation(s)
Extensions	• Various extensions depending on the reason why system demands new information from the user. • various extensions depending on the choice of user(s) that are receiving the request. Could be just one user, right after submitting some information, could be all users *currently* in an area, could be also limited by user type/interests, time, location...
Alternative paths	
Post conditions	User can easily submit new observation (program started with appropriate parameters)
Non-functional requirements	User must have a control over the notifications, in order to avoid spamming. E.g. user choooses weather (or in which cases - time, space,) he may be contacted by the system with requests of this type.
Validation statement	
Notes	I know this has been asked for in some WPx UCs, but can't find it now. TODO: please link!
Author and date	
Includes UseCase	User provides new observation(s) to the system System sends alerts/notifications to users User provides new observation(s) to the system through web portal User provides new observation(s) to the system through mobile PIS

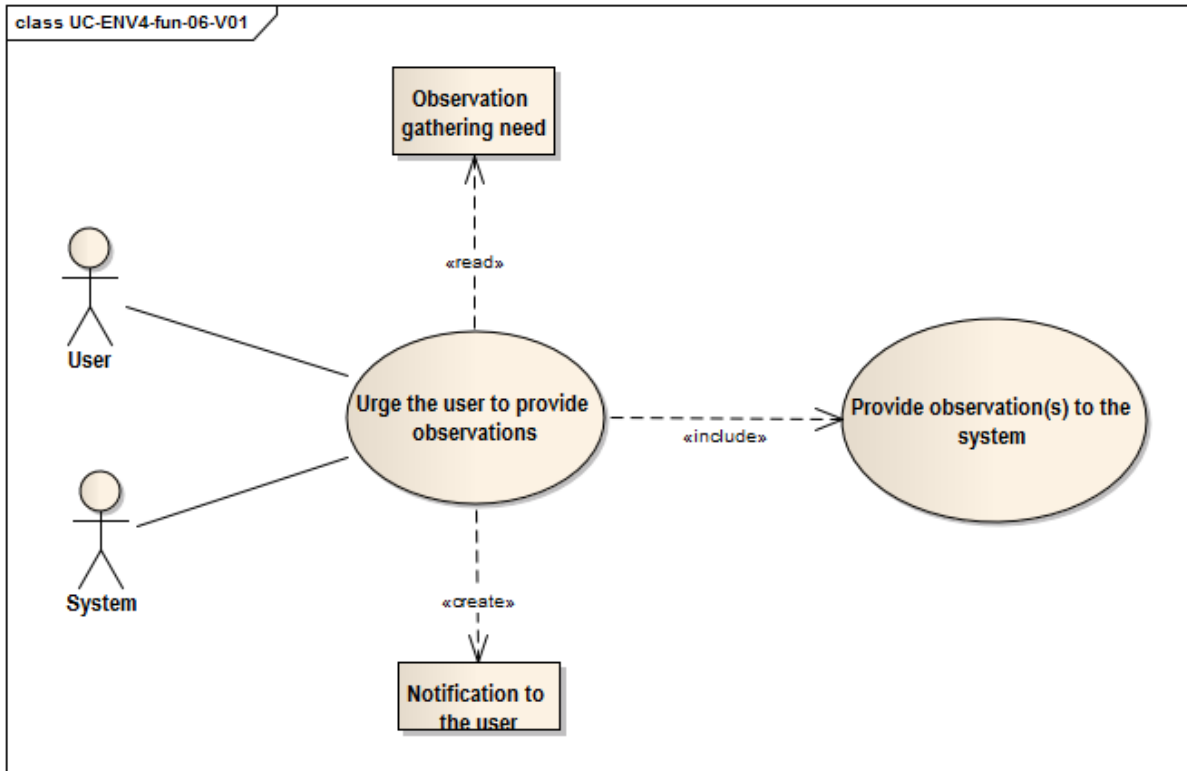Table 15: UC-ENV4-fun-06-V01 – System urges the user to provide observation(s)

Figure 6: Use case UC-ENV4-fun-06-V01 System urges the user to provide observation(s)

2.1.14 System assesses the quality of observations

	System assesses the quality of observations
Use Case ID	UC-ENV4-kno-01-V01
Use Case Name	System assesses the quality of observations
Revision and Reference	V01; http://envirofi.server.de/servlet/is/5790/
Reference	`http://envirofi.server.de/servlet/is/5790/`
Use Case Diagram	
Status	Active
Priority of accomplishment	Should have
Goal	Check the plausibility of a reported observation(s)
Summary	The system compares the newly submitted observation with the known facts and estimates the plausibility of the report (e.g. probability of false report).Some possible tests: - Spatial probability (i.e. Does this observation fit into this region? Does it occur within the know distribution area?) - Temporal probability (i.e. Can it be observed at this time of the year?) - Comparison with common mis-identifications (i.e. Provide user with image of other types often confused with type identified - does the leaf of this species look like this?) - related occurrences (do observations in same time/space fit together?) - compatibility with environment (does observation fit into the geo/bio-physical characteristics of the area?) - quality of information previously submitted by this user - opinions of other users/experts
Category	Knowledge generation/Quality Assurance
Actor	User, SW Component
Primary Actor (initiates)	SW component
Stakeholder	
Requested Information Resources	- observation storage - query templates - Background information which can be used to estimate the plausibility (e.g. existing observations; habitat, seasonal changes, etc.) - plausibility record (a kind of "receipt") for having performed the plausibility check (create)

cont...

	System assesses the quality of observations
Preconditions	User is logged in, has provided an occurrence record
Triggers	observation validation/quality assurance
Main success scenario	• system estimates the plausibility of the observation • system stores the plausibility record with the observation
Extensions	• system informs the user of observation plausibility • system presents user with alternatives to his/her observation
Alternative paths	
Post conditions	The plausibility of the occurrence record is known
Non-functional requirements	• In case the user is given opportunity to improve the observation, the time needed to estimate the plausibility has to be "instantenious" for the user (order of magnitude: 1 sec)
Validation statement	The plausibility of the observation has been estimated and the result stored. Optional: user has been given feedback & opportunity to improve the observation)
Notes	The system could continiously update the "trust" in user's competence based on the plausibility of the observations submitted by this user, and use this information as additional factor in plausibility estimate. This is especially interestin gin the case system uses peer review (by other users, experts) as (one of) the method(s) for quality assurance.
Author and date	KS_UBA, 2011-07-19
Abstracted from UseCase	Check occurrence record for plausibility

Table 16: UC-ENV4-kno-01-V01 – System assesses the quality of observations

2.1.15   System identifies the observed phenomena / environmental state

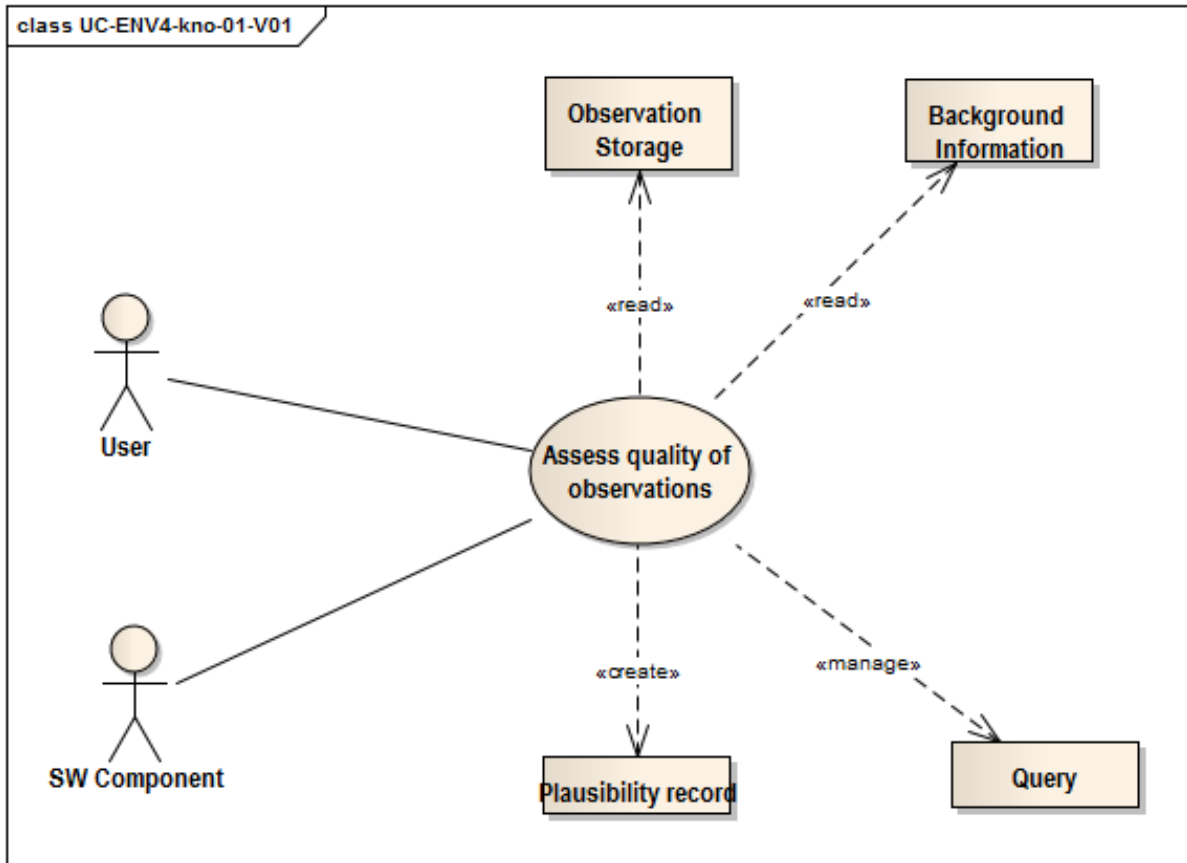|	System identifies the observed phenomena / environmental state
Use Case ID	UC-ENV4-kno-02-V01
Use Case Name	System identifies the observed phenomena / environmental state
Revision and Reference	V01; http://envirofi.server.de/servlet/is/5802/
Reference	`http://envirofi.server.de/servlet/is/5802/`
Use Case Diagram	
Status	Active
Priority of accomplishment	Should have

Figure 7: Use case UC-ENV4-kno-01-V01 System assesses the quality of observations

	System identifies the observed phenomena / environmental state
Goal	Extract the knowledge from the observation; tag/name/extend/improve the observation record
Summary	System analyses the multimedia, sensoric or subjective input provided as the part of observation record, identifies the observed phenomena/state and stores this additional information with the observation record.The knowledge about the possible observed phenomena/environmental states may be known to the system by means of an environmental ontology as an example..Example: user submits a photography of a plant; the system recognises the plant and stores this information.Example: user reports sneezing; system inferes the existence of alergenes

	System identifies the observed phenomena / environmental state
Category	Knowledge generation/Quality Assurance
Actor	User, SW Component
Primary Actor (initiates)	SW component
Stakeholder	
Requested Information Resources	- Environmental ontology (read) - observation data - observed phenomena (update of the meta-data of the observation record)
Preconditions	User is logged in, has provided an occurrence record
Triggers	observation validation/quality assurance
Main success scenario	- system analyses the observation (especially the multimedia records; sensor readings) & identifies the observed phenomena/environmental state - system stores analysis results with the observation
Extensions	- system informs the user of analysis results (e.g. "you have observed a seagull") - system presents user with possible meanings of his/her observation; use chooses which one is correct (e.g. "this could be a bird, a plane, or a superman, pleas choose one") - System stores the probabilities for several alternative identifications, rather than unique identification key.
Alternative paths	
Post conditions	The system has identified the phenomena/state of environment, generated additional (semantic) information on the observation, and stored it as part of observation record.
Non-functional requirements	
Validation statement	Additional Information/knowledge on the observation is stored with the observation record.
Notes	- The generation of new knowledge is typically heading towards "recognition" of the observed phenomena. This UC therefore typically concerns the recognition of some state of environment (animal name, weather type, presence of allergenes) based on multimedia, sensoric or subjective observations. - An alternative to "store as part of the record" could be "semantic tagging", that is associating an RDF triple with existing record without actually changing the record. - The feasibility of generic recognition algorithms is questionable - state of the art are very specialized algorithms for recognising certain classes of observations (e.g. the algoritm capable of recognising various members of feline family may not be suitable for other animals, etc.)

	System identifies the observed phenomena / environmental state
Author and date	KS_UBA, 2011-07-19
Abstracted from UseCase	Provide identification for image Provide identification for sound

Table 17: UC-ENV4-kno-02-V01 – System identifies the observed phenomena / environmental state
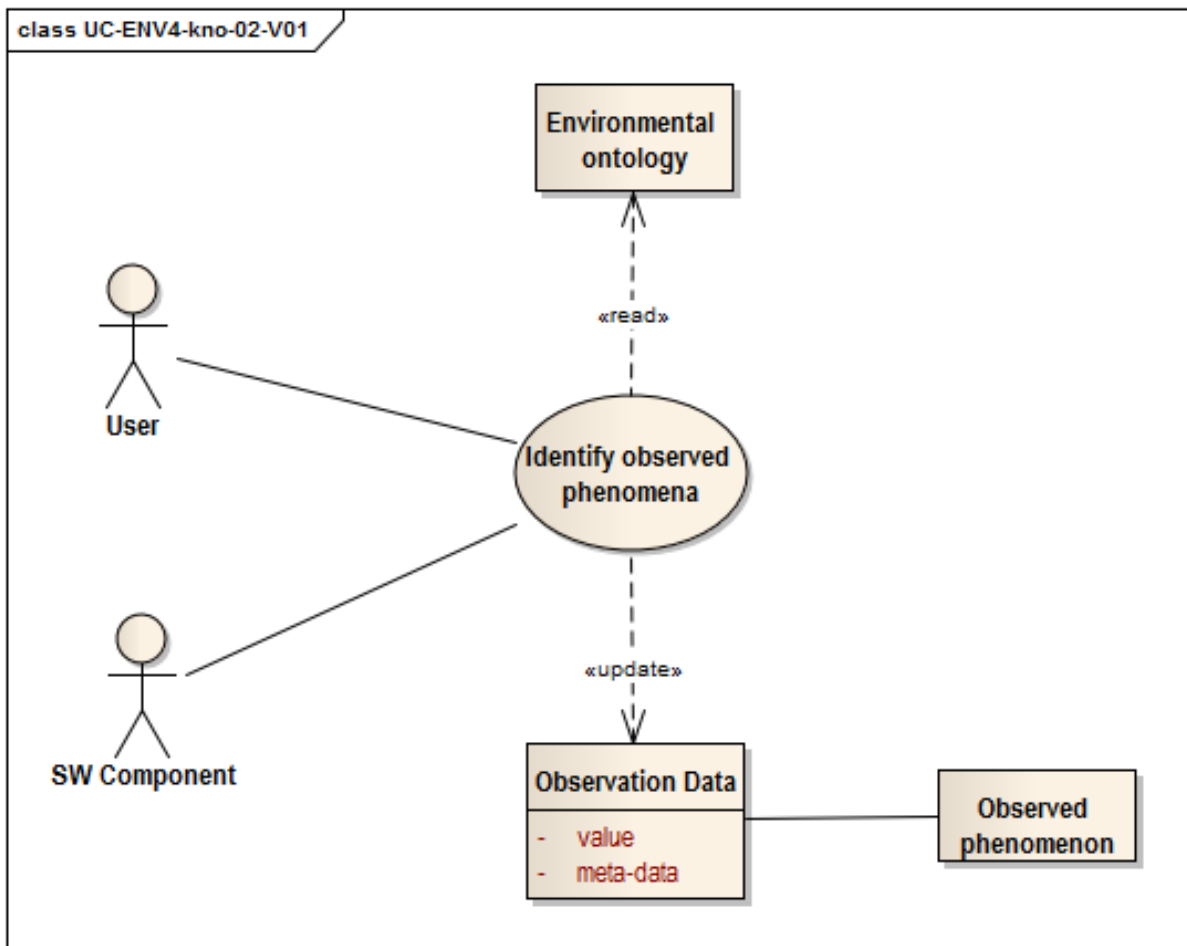

Figure 8: Use case UC-ENV4-kno-02-V01 System identifies the observed phenomena / environmental state

2.1.16 System uniquely identifies users

	System uniquely identifies users
Use Case ID	UC-ENV4-sec-01-V01
Use Case Name	System uniquely identifies users

System uniquely identifies users

Revision and Reference	V01; http://envirofi.server.de/servlet/is/5226/
Reference	`http://envirofi.server.de/servlet/is/5226/`
Use Case Diagram	
Status	Active
Priority of accomplishment	Must have
Goal	Assure application can perform user-specific actions
Summary	The user is "recognised" by ENVIROFI application, and able to perform actions on his/her own behalf.
Category	Security, privacy, trust
Actor	User, SW Component e.g. ENVIROFI application or a single-sign-on server (optional)
Primary Actor (initiates)	
Stakeholder	
Requested Information Resources	• list of registered users & credentials
Preconditions	The user is registered with the ENVIROFI System
Triggers	The user starts the mobile app or logs in to the web portal.
Main success scenario	• System demands from the user to identify himself • User provides credentials • The user is successfully identified and can proceed with further work (System allows user to continue)
Extensions	• "Generate new login": the system generates a new user-ID, e.g. based on user's or administrators request • "Single sign on": the same user registration should also be available across various applications. • "ofshore profiles": sensitive part of the user's profile is stored on a different service, or on user's device. • "automatic profiles": part of the user's profile is automatically set, user has no influence and may not even be aware of this
Alternative paths	User is prevented form further work with ENVIROFI application
Post conditions	• User is asigned unique identity within the system
Non-functional requirements	System should assure the maximal possible protection of the user's privacy. This is particularly interesting in the cases where our volunteers are minors (e.g. school classes) and in the cases where users provide potentially sensitive data (e.g. the data on user's well-beeing can be used to infer user's health status => could be misused)Therefore, the privacy-related data should be separated from the data required by the application. Possible setup: • Name, e-mail, etc. only known to trusted SSO site • Each applicaiton only sees an ID which is unique for this application, but not globaly unique • The SSO site may also provide some type of trust info to applications (tbd) • All communication with the user (e.g. send e-mail) also goes through SSO site, where user can decide wether he wants to allow this communication or not - to prevent spamming

	System uniquely identifies users
Validation statement	• All further steps taken by this user can be clearly correlated with this user
Notes	This UC is inherently present in/required by many other WP1, WP2 and WP3 UCs. These relations are currently not shown.As a general principle, ENVIROFI applicaitons should keep the data required for the applicaitons functionality (e.g. observations provided by the user) separated from the data allowing to infer the user's real identity (name, address, e-mail, ...) . Ideally, the user's identity-relevant data should be maintained by separate organisation. Also, the user should be able to choose arbitrary "nickname" for each of the applications he/she uses.In this way, the misuse of the data is made more difficult: • application providers have no information on real identity of their users; furthermore, they can only communicate with the user through external service provider (prevents spamming) • Single-sign-on providers have access to information on users identity and the list of the applications he/she uses, but can not access the data kept by application providers. • all other actors will find it difficult to correlate the data provided by some user with his/her identity.
Author and date	DH_AIT, 2011-08-18
Abstracted from UseCase	Login User Login user

Table 18: UC-ENV4-sec-01-V01 – System uniquely identifies users
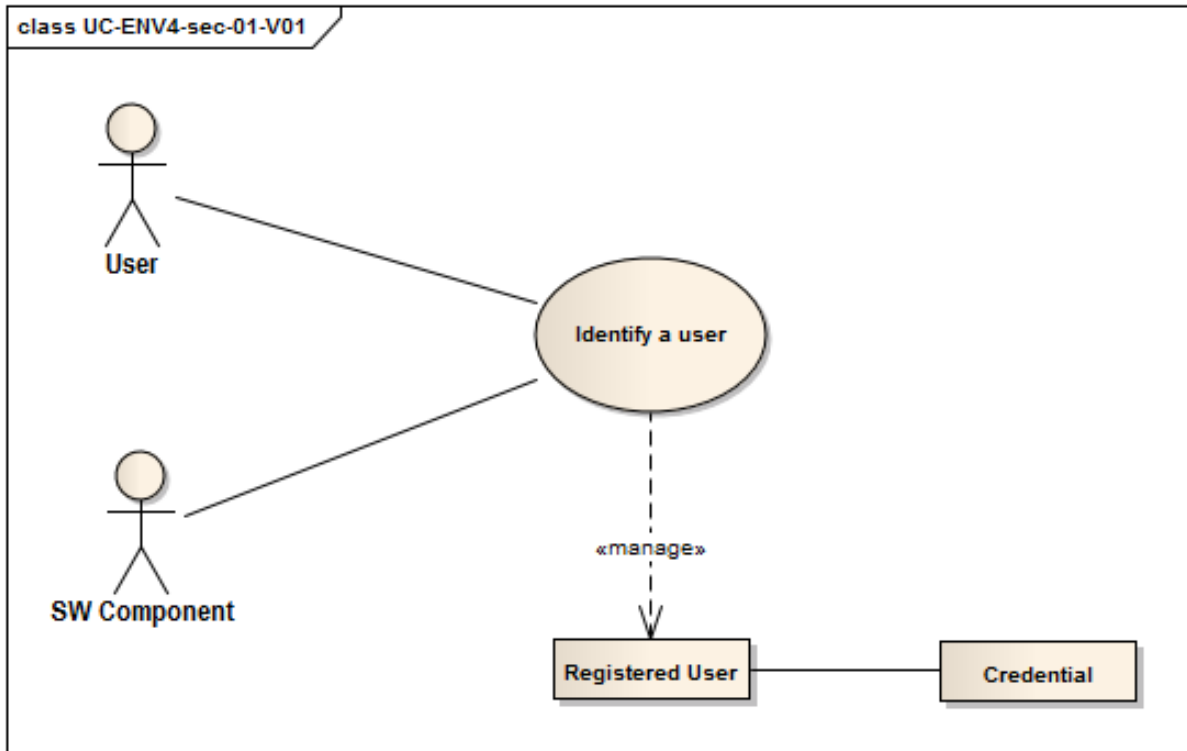
Figure 9: Use case UC-ENV4-sec-01-V01 System uniquely identifies users

2.1.17 Support user-specific application behaviour

	Support user-specific application behaviour
Use Case ID	UC-ENV4-sec-02-V01
Use Case Name	Support user-specific application behaviour
Revision and Reference	V01; http://envirofi.server.de/servlet/is/5228/
Reference	`http://envirofi.server.de/servlet/is/5228/`
Use Case Diagram	
Status	Active
Priority of accomplishment	Must have
Goal	Assure ENVIROFI applications can perform in user-specific manner
Summary	ENVIROFI applications should act differently for various users. For instance, the look and feel of the applications may change; system may generate different actions (e.g. send user-specific alerts); change the data shown to the user (e.g. based on his/her position or interests); or the user may be permitted to perform certain actions (e.g. view/edit/tag certai data or edit/view own profile). Also the level of trust in user-provided information may depend on the user.
Category	Security, privacy, trust
Actor	All
Primary Actor (initiates)	All
Stakeholder	
Requested Information Resources	• user's profile information • user's position • System functionality (read) (in order to know what shall be done) • Behavioural description (update) (in order to describe how the system shall behave) Note: the word "profile" is used in generic way here, and includes any information that the system connects with users's id. this could be user's preferences for application's look and feel, list of users topics of interests, locations of interest, current location, etc.

	Support user-specific application behaviour
Preconditions	The user is authenticated
Triggers	
Main success scenario	The user is allowed to perform actions corresponding to his/her identity
Extensions	- System automatically performs actions depending on users profile (e.g. generates alerts) - System modifies its responses to user's action depending on users's profile (e.g. shows a list of birds spotted in vicinity to bird watchers) - Observations provided by the user is assigned certain trust level (note: an alternative to storing this info with the data may be to calculate the trust level on the fly when data is asked-for) - User changes the preferences - Administrator changes the preferences for one or more users (e.g. assigns users with additional rights, modifies trust level) - System automatically changes the preferences for one or more users (e.g. changes the tresholds for alerts based on correlations between users observations and known meteo conditions)
Alternative paths	
Post conditions	
Non-functional requirements	The system must be designed in a way that minimizes the risk of misuse of the information related to users that is stored on the system. Related requirenments: - System should only store the user-related data that is necessary for the application, for the duration of this need. - In particular, the system should separate the data relieving the user's identity (e.g. name, e-mail, address, telephone...) from the data relieving the user's habits, interests or health status (e.g. contributed observations) - System should allow users to determine the permissions on the data they contributes (e.g. who is allowed to view them?), as well as to choose what will be shown in "author" field (real name, affiliation, nickname, hidden...) Furthermore, the system must provide a mean to remove all information related to the user if/when needed. In this context, it is important to clearly state what happens with the additional information previously provided by this user, such as volunteered observations, and to assure the system follows these guidelines. Generally we have three possibilities: - delete all data provided by user when user is removed - set the owner of this data to "anonymous", - set the owner of this data to a newly generated user, thus keeping the information that all this data has been provided by a single user (usefull for QA/trust management purposes)

Support user-specific application behaviour

Validation statement	- All further steps taken by this user can be clearly correlated with this user - Users' snd system's actions are bound to limitations defined in the user's profile
Notes	System's (user-dependent) behaviour can be altered in different ways. Some examples: - User manually setts new alert conditions. - System calculates new alert conditions based on well-beeing data previously provided by user. - Administrator assigns additional rights to user (e.g. by adding him/her to special user group) - User's "Trust level" changes based on the quality of observations provided by him/her
Author and date	DH_AIT, 2011-08-18
Maps to Requirement	To generate trust metric by expert. Authenticate, Authorise and Access user for required to data sources.
Abstracted from UseCase	Assess Background material - Researcher Get local and regional check lists - Researcher Local Interesting Information - Nature hobbyists and Advanced amateurs Local Interesting Information - Teachers and pupils Personal Exposure Report - Air Quality Personal Exposure Report - Air Quality alternate locales Provide activity pattern of user Display past meteorological conditions and events Personal Exposure Report - Meteorology Display predicted exposure to air pollution and pollen Display current exposure to air pollution and pollen Display current meteorological conditions and events Personal Situation Monitoring - Met conditions Personal Situation Monitoring - Met conditions alternate locales Display predicted meteorological conditions and events Phone Settings Predefined profile Predictive alerts based upon user observations Provide Occurrence - Nature hobbyists & Advanced amateurs Provide Occurrence - Researcher Provide Occurrence - Teachers and pupils Raise system alert and notify user if threshold is breached Threshold Creation User Input - Health condition User Input - Observational Reporting User Input - Profile Validate Occurrence - Researcher Display past exposure to air pollution and pollen Choose from predefined profiles in order to receive alerts Report environmental observation to system Determine user trustability Request validation of report from other users Check observational report of user Provide demographic information of user Report health condition to system Cross-check report with internal data Change personal settings Check personal settings Display observational reports of other users Display health reports of other users Determine air quality from uploaded photo

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Support user-specific application behaviour

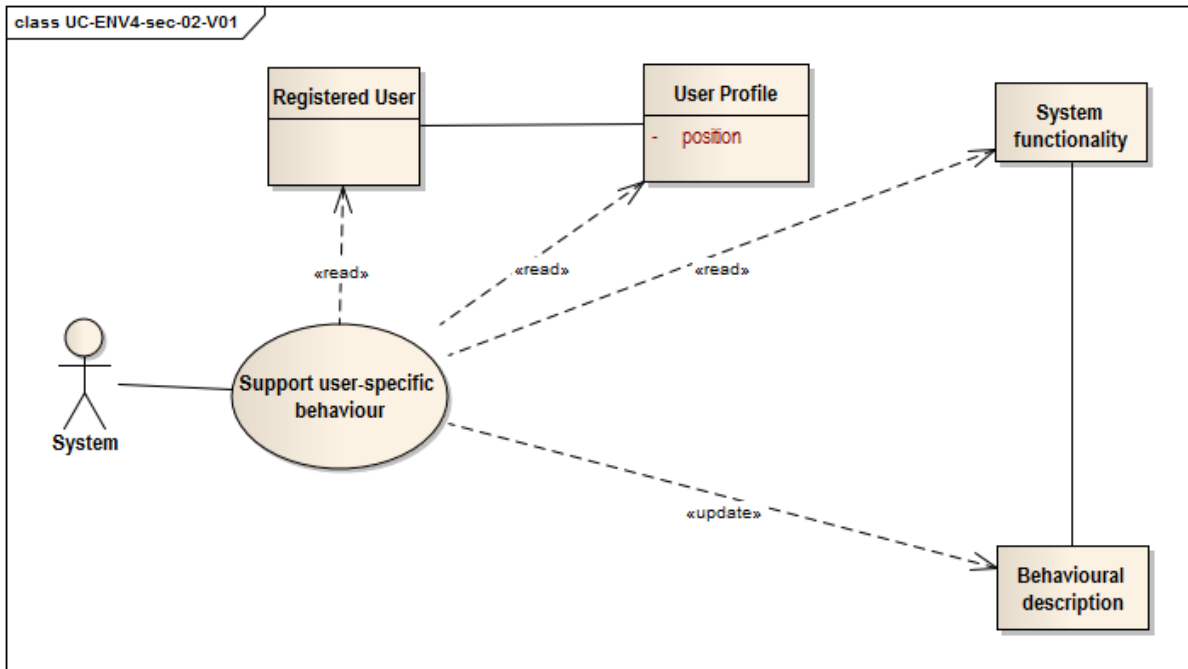Table 19: UC-ENV4-sec-02-V01 – Support user-specific application behaviour

Figure 10: Use case UC-ENV4-sec-02-V01 Support user-specific application behaviour

2.1.18 Observation access requiring license approval

	Observation access requiring license approval
Use Case ID	UC-ENV4-sec-03-V01
Use Case Name	Observation access requiring license approval
Revision and Reference	
Reference	`http://envirofi.server.de/servlet/is/6113/`
Use Case Diagram	
Status	
Priority of accomplishment	Should have
Goal	To allow observation providers to require an explicit approval of a license to access data
Summary	An observation provider may associate a text document reporting the license associated to an observation or observation set. Upon a user request, the license will be provided to the user for explicit approval.

	Observation access requiring license approval
Category	
Actor	User (provider), ENVIROFI system
Primary Actor (initiates)	
Stakeholder	
Requested Information Resources	License
Preconditions	
Triggers	
Main success scenario	- Observation provider publishes the license text - Observation provider associates license with observation - System updates observation metadata to reflect license information
Extensions	
Alternative paths	
Post conditions	Observations have associated a license
Non-functional requirements	
Validation statement	
Notes	
Author and date	
Includes UseCase	User provides new observation(s) to the system
Maps to Requirement	Enable authorization based on license approval Enable security privileges to an access broker Enable access to observations data and modelling from experts and stakeholders.

Table 20: UC-ENV4-sec-03-V01 – Observation access requiring license approval

2.1.19 System provides information about observation uncertainty

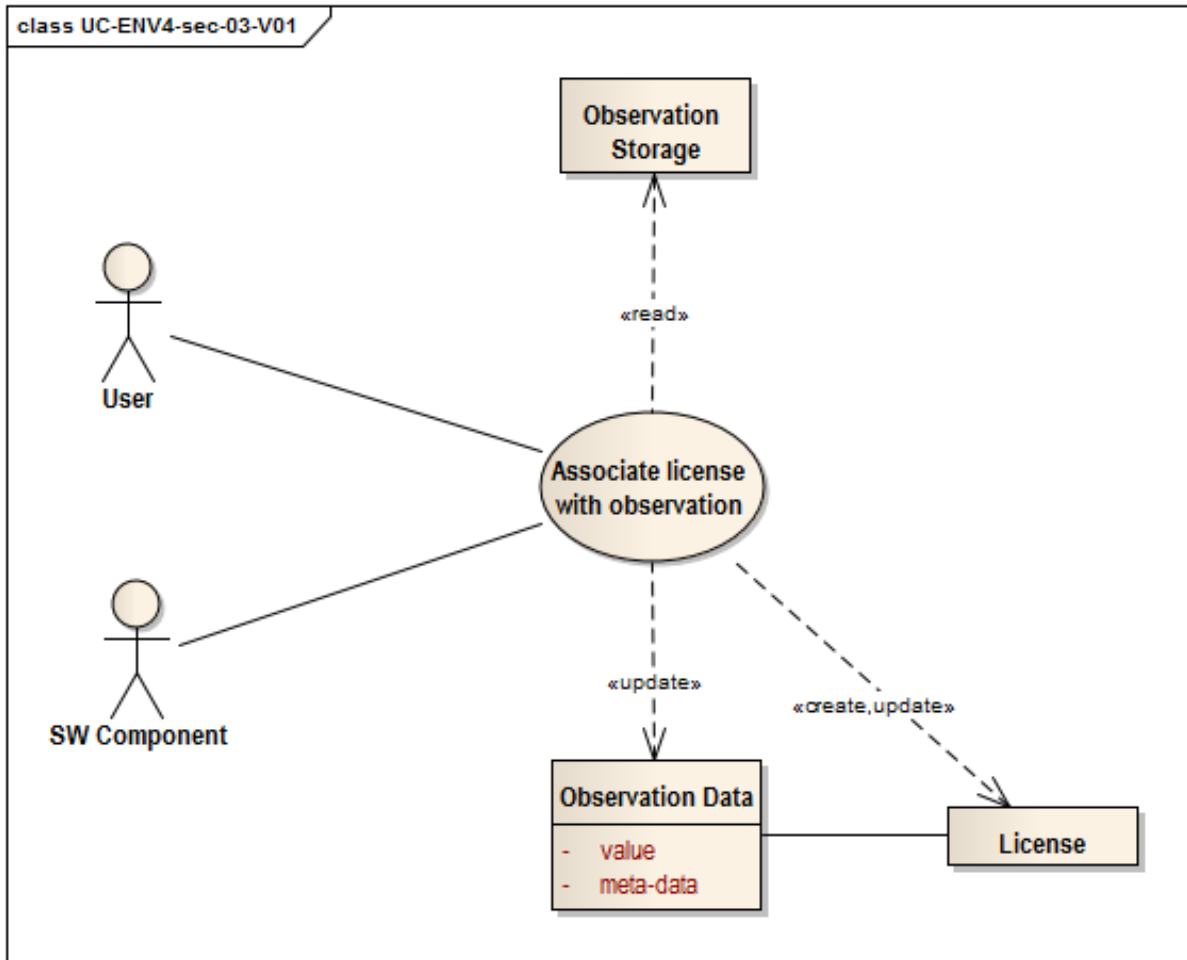|	**System provides information about observation uncertainty**
Use Case ID	UC-ENV4-tru-01-V01
Use Case Name	System provides information about observation uncertainty
Revision and Reference	V01; http://envirofi.server.de/servlet/is/6109/
Reference	`http://envirofi.server.de/servlet/is/6109/`
Use Case Diagram	
Status	
Priority of accomplishment	Should have

Figure 11: Use case UC-ENV4-sec-03-V01 Observation access requiring license approval

	System provides information about observation uncertainty
Goal	Provide information about the reliability of the observation
Summary	Beside observation data, the system provides the associated uncertainty that can be provided/visualized in alternative or along with data. The uncertainty may depend either on data quality (e.g. precision and accuracy of a sensor), or on probabilistic results (e.g. from a model simulation).Examples: a) an user runs a Ecological Niche Model on different Climate Change scenarios to evaluate changes in species geographical distribution. The result isshown as an occurrence probability map.b) an user accesses information on air pollution coming from different sensors: a certified sensor network, and a network of low-quality home stations managed by citizen scientists. The user can visualize the data map and a layer showing the different trust degree.

cont...

	System provides information about observation uncertainty
Category	
Actor	User, Envirofi system
Primary Actor (initiates)	User
Stakeholder	
Requested Information Resources	ObservationsRelated Uncertainty
Preconditions	User is known to the system
Triggers	
Main success scenario	- User chooses the source(s) of observations he/she is interested in (could be stored in his/her profie) - User chooses how he/she wants to be informed. - system presents the interesting information (repeatedly)
Extensions	
Alternative paths	
Post conditions	User is informed about reliability of information
Non-functional requirements	
Validation statement	
Notes	
Author and date	
Includes UseCase	User accesses the existing observations
Maps to Requirement	Uncertainty representation

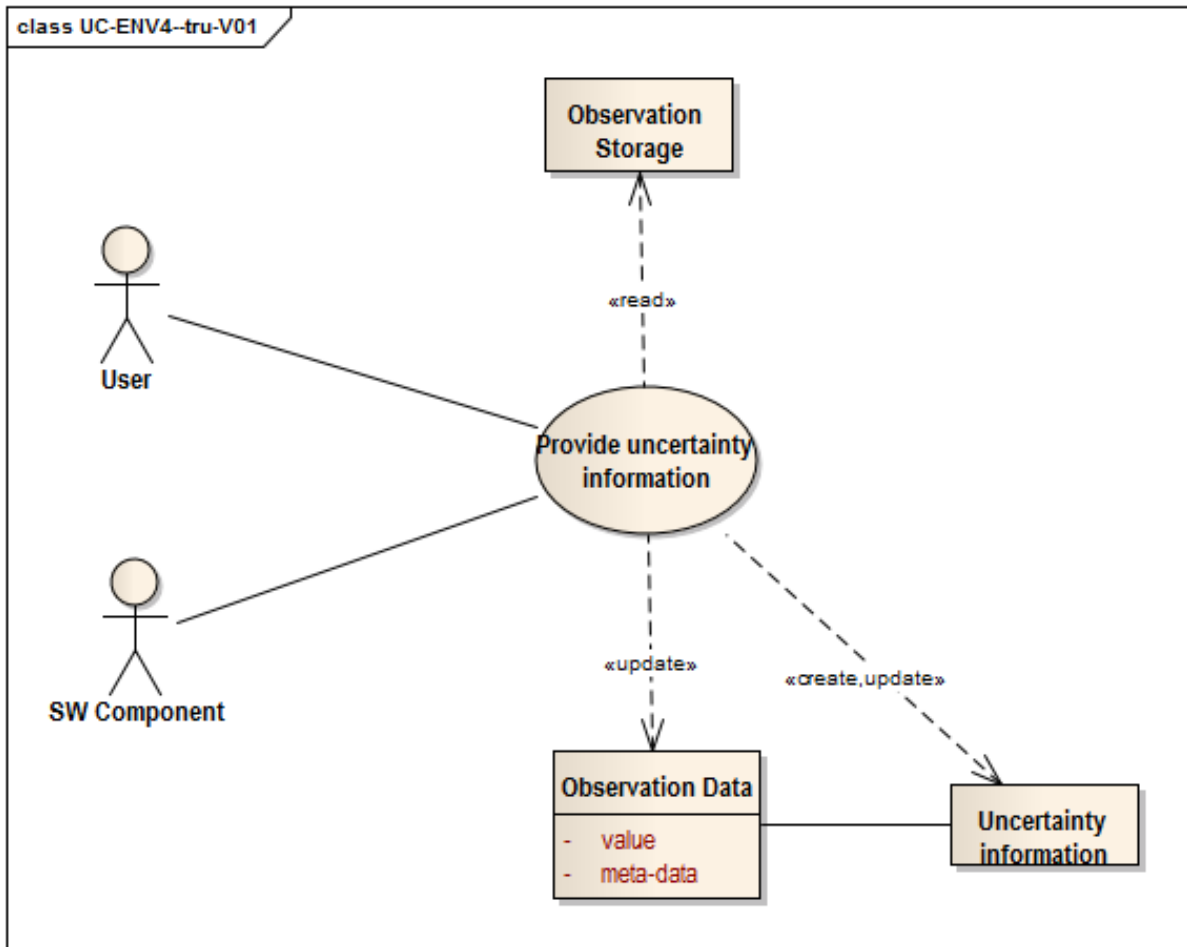Table 21: UC-ENV4-tru-01-V01 – System provides information about observation uncertainty

Figure 12: Use case UC-ENV4-tru-01-V01 System provides information about observation uncertainty