

# **Definition of crmsurv ongoing**

2023/02/17

Contributors: George Bruseker, Tymon de Haas, Martijn van Leusen, Denitsa Nenova

License information: Creative Commons Licence Attribution-ShareAlike 4.0 International

Exported from OntoME: <https://ontome.net/namespace/213>



# **Introduction**

## **Scope**

This is an extension to CIDOC CRM to handle key concepts for data integration of archaeological survey data.

## **Status**

Ongoing version

# **crmsurv ongoing class hierarchy, aligned with portions from the CIDOC CRM version 6.2, CRMarchaeo version 1.4.1, CRMsci version 1.2.3, CRMdig version 3.2.1 and the CIDOC CRM class hierarchies**

This class hierarchy lists:

- all classes declared in crmsurv ongoing
- all classes declared in CIDOC CRM version 6.2 that are declared as superclasses of classes declared in the crmsurv ongoing
- all classes declared in CRMarchaeo version 1.4.1 version 1.4.1 that are declared as superclasses of classes declared in the crmsurv ongoing
- all classes declared in CRMsci version 1.2.3 version 1.2.3 that are declared as superclasses of classes declared in the crmsurv ongoing
- all classes declared in CRMdig version 3.2.1 version 3.2.1 that are declared as superclasses of classes declared in the crmsurv ongoing
- all classes declared in CIDOC CRM version 6.2 that are either domain or range for a property declared in the crmsurv ongoing
- all classes declared in CRMarchaeo version 1.4.1 version 1.4.1 that are either domain or range for a property declared in the crmsurv ongoing
- all classes declared in CRMsci version 1.2.3 version 1.2.3 that are either domain or range for a property declared in the crmsurv ongoing
- all classes declared in CRMdig version 3.2.1 version 3.2.1 that are either domain or range for a property declared in the crmsurv ongoing

*Table 1: Class Hierarchy*

E18	Physical Thing	
U6	-	Material Sample
E55	Type	
U7	-	Fabric
U8	-	Function
U9	-	Ware
U10	-	Shape
U11	-	Vessel Part
E7	Activity	
U1	-	Archaeological Survey
S13	Sample	
U6	-	Material Sample
S19	Encounter Event	
U2	-	Survey Collection Activity
U3	-	Survey Process Unit
U5	-	Digitization Process Unit
S2	Sample Taking	
U2	-	Survey Collection Activity
U5	-	Digitization Process Unit
S20	Physical Feature	
U4	-	Survey Surface Unit

## List of external classes used in crmsurv ongoing

*Table 2: List of external classes grouped by model and ordered by model (exception: CRMbase always goes first) and then by class identifier.*

Class identifier	Class name	Model	Version
E7	Activity	CIDOC CRM	6.2
E18	Physical Thing	CIDOC CRM	6.2
E55	Type	CIDOC CRM	6.2
A6	Group Declaration Event	CRMarchaeo: An Extension of CIDOC CRM to support the archaeological excavation process	1.4.1

S2	Sample Taking	CRMsci: An Extension of CIDOC CRM to support scientific observation	1.2.3
S4	Observation	CRMsci: An Extension of CIDOC CRM to support scientific observation	1.2.3
S13	Sample	CRMsci: An Extension of CIDOC CRM to support scientific observation	1.2.3
S19	Encounter Event	CRMsci: An Extension of CIDOC CRM to support scientific observation	1.2.3
S20	Physical Feature	CRMsci: An Extension of CIDOC CRM to support scientific observation	1.2.3

## **crmsurv ongoing property hierarchy, aligned with portions from the CIDOC CRM version 6.2, CRMarchaeo version 1.4.1, CRMsci version 1.2.3, CRMdig version 3.2.1 and the CIDOC CRM property hierarchies**

This property hierarchy lists:

- all properties declared in crmsurv ongoing
- all properties declared in CIDOC CRM version 6.2 that are declared as superproperties of properties declared in the crmsurv ongoing
- all properties declared in CRMarchaeo version 1.4.1 version 1.4.1 that are declared as superproperties of properties declared in the crmsurv ongoing
- all properties declared in CRMsci version 1.2.3 version 1.2.3 that are declared as superproperties of properties declared in the crmsurv ongoing
- all properties declared in CRMdig version 3.2.1 version 3.2.1 that are declared as superproperties of properties declared in the crmsurv ongoing

*Table 3: Property Hierarchy*

<b>Property id</b>	<b>Property Name</b>	<b>Entity – Domain</b>	<b>Entity - Range</b>
--------------------	----------------------	------------------------	-----------------------



# crmsurv ongoing Class Declarations

The classes are comprehensively declared in this section using the following format:

- Class names are presented as headings in bold face, preceded by the class' unique identifier;
- The line "Subclass of:" declares the superclass of the class from which it inherits properties;
- The line "Superclass of:" is a cross-reference to the subclasses of this class;
- The line "Scope note:" contains the textual definition of the concept the class represents;
- The line "Examples:" contains a bulleted list of examples of instances of this class.
- The line "Properties:" declares the list of the class's properties;
- Each property is represented by its unique identifier, its forward name and the range class that it links to, separated by colons;
- Inherited properties are not represented;

## U1 Archaeological Survey

### Subclass of:

E7 Activity

### Scope note:

This class comprises any coherent set of systematic research activities aimed at recording the presence and properties of material archaeological remains present at the earth's surface, by means of direct observation in the field.

Archaeological surveys are characterised by coherence in time (they consist of a single campaign or season of field research), aims and goals (as defined by the Institution carrying it out), methods, and geographic scope (study area). For example, a University may run a 4-year project to conduct systematic intensive surveys in the hinterland of a specific Roman town, aiming to record all activities relating to agricultural land use. Each field season within such a project forms one instance of U1 Archaeological Survey

An archaeological survey (U1) consists of multiple consecutive investigations of land plots, instances of U4 Surface Survey Units, involving the making of field observations, the collection of archaeological materials, and/or the subsequent processing of those materials, according to a standard set of protocols.

While the particular circumstances of the start and end of an archaeological survey vary by case, an instance can typically be said to have come into existence upon the start of the first survey activity and covers the immediate activities associated with the survey such as fieldwalking and preliminary material studies. It ends upon the end of the last survey activity. All publication activities and scientific analyses that may be involved to better understand the results of the survey

activities are a part of the overall Project (PE35) constituted for specific research objectives, and not part of the archaeological survey. An instance of PE35 can consist of one or multiple instances of U1 Archaeological Survey but may also involve instances of A9 Archaeological Excavation as well as other activities.

**Examples:**

The survey (U1) of the small islands around Paros during 2019 as a part of the SCIP Project (PE35).

The 1975 field season (U1) of the Biferno Valley Survey (PE35).

**In First Order Logic:**

$U1(x) \Rightarrow E7(x)$

## **U2 Survey Collection Activity**

**Subclass of:**

S2 Sample Taking

S19 Encounter Event

**Scope note:**

This class comprises the collection of archaeologically relevant objects from a land plot. In the context of systematic survey practices, instances of Survey Collection Activity take place at an U4 Surface Survey Unit during and as a part of an U3 Survey Process Unit, usually but not necessarily following an established protocol. This involves the collection of human-made objects such as pottery, metal objects, lithics, etc. but can also include natural objects such as unworked stones without any specific analytical value that are later discovered to be irrelevant and typically discarded from the collection.

An instance of Survey Collection Activity comes into existence upon the intentional removal of parts of the Survey Surface Unit observable on the ground. The Survey Collection Activity ends when the last artefact or a physical object from the specific Survey Surface Unit or Site has been picked up from the ground, recorded, and typically inserted into a container with the rest of the finds from the same unit or site.

**Examples:**

*The surveying, by team A on 7 juli 2005, of unit 2986 of the Raganello Archaeological Survey project.*

*The visit of the Lower Town near the Palace of Nestor on 13th May 1967 by the Pylos Survey Project.*

**In First Order Logic:**

$U2(x) \Rightarrow S2(x)$

$U2(x) \Rightarrow S19(x)$

**Properties:**

UP3 collected (was collected by): A6 Group Declaration Event

## **U3 Survey Process Unit**

**Subclass of:**

S19 Encounter Event

**Scope note:**

This class comprises acts of investigation, as part of an archaeological survey, that observe a single, discrete land plot during a single continuous time period (or ‘visit’), according to an established protocol. This may include the recording of Survey Surface Unit (U4) properties and physical features and the making of observations by field walkers. It does not inherently include the collection of artefacts. In case an instance of U3 Survey Process Unit entails such activities, these should be modelled with Survey Collection Activity (U2) and related to the overall U3 Survey Process Unit as follows:

Survey Unit -> surveyed by Survey Process Unit -> p9 consists of Survey Collection Activity -> collected -> Material Sample

An instance of Survey Process Unit comes into existence when individuals enter into the act of investigating a particular defined Survey Surface Unit (U4) following the assigned plan. The instance of Survey Process Unit is on-going so long as the investigation continues at the specified survey surface unit. The activity is at an end when the investigation has closed in accordance with the plan or is interrupted by any event that impedes its completion (e.g.: weather conditions, conflict with land owners, health conditions, etc.)

**Examples:**

The surveying, by team A on 7 juli 2005, of unit 2986 of the Raganello Archaeological Survey project.

The visit of the Lower Town near the Palace of Nestor on 13th May 1967 by the Pylos Survey Project.

**In First Order Logic:**

$U3(x) \Rightarrow S19(x)$

**Properties:**

UP2 surveyed (was surveyed by): U4 Survey Surface Unit

## U4 Survey Surface Unit

**Subclass of:**

S20 Physical Feature

**Scope note:**

This class comprises single land plots with artificially or physically defined boundaries that are the object of investigation in an Archaeological Survey (U1). Plots can be defined by imposing a geographical grid that ignores the landscape, or by following existing land use or land cover; their geometry can be point-, line, or polygon-based depending on the survey design. Typical nouns used to describe this class are tracts, units, walker lines. The substance of a Survey Surface Unit is a material physical feature on the Earth with a specified boundary.

Instances of Survey Surface Unit come into existence [1] through their designation in an official survey surface registration system. They continue to exist so long as the material physical feature designated continues to exist in substantially the same place and form and the boundary indicators for these plots can be recalled through some medium (physical, digital, memory). A Survey Surface Unit ceases to exist when it is sufficiently degraded so that it no longer bears a material or spatial continuity with its original designation or if the designating information is lost. For example, when it has been substantially altered or removed by fluvial erosion, quarrying, etc. or there remain no records that allow the re-identification of the land plots on the surface of the earth.

Survey Surface Units are typically designed to help the identification of archaeological sites and/or the mapping of the archaeological landscape as a continuum.

A note concerning the relation between a site, in the colloquial sense, an instance of survey surface unit U4, and the CRM class E27 Site:

What archaeologists regard as a 'site' is modelled as a type of E27 Site. An E27 Site as a physical feature exists objectively in the world with or without our knowledge of it, but comes to be declared an 'archaeological site' as a result of archaeological surveys or similar practices. This would typically be documented through the p2 has type E55 relation using a vocabulary term for archaeological site. One 'site' may be covered by and consist of one or many instances of U4 Survey Surface Units and one instance of U4 Survey Surface Unit can contain one or many

archaeological sites. Once declared as archaeological, a site may itself be considered also to be an U4 and thus be visited directly via a Survey Process Unit.

1. Of course being physical objects they preexist their being named or recognized by human beings. Their existence in a physical sense as a certain conglomeration of matter in space and time is not dependent on the existence of human beings. But once named and defined by a human group the physical substance now supports an additional identity that it did not have before which nonetheless has physically objective and findable properties. It is in this way that the object qua (as) survey unit comes to be although regarding its substance as matter that matter was already in existence yet without the attribution of an identity relative to a survey.

**Examples:**

Unit 2986 of the Raganello Archaeological Survey project

Tract 148 of the Zakynthos Survey

Point-sample 842 of the Riu Mannu survey

**In First Order Logic:**

$U4(x) \Rightarrow S20(x)$

## U5 Digitization Process Unit

**Subclass of:**

S2 Sample Taking

S19 Encounter Event

**Scope note:**

This class comprises digital registration activities of properties of physical things using specialised equipment designed to capture physical signals from objects using sensors and record them as usable / interpretable digital outputs with specific set parameters, which typically affect the output and the interpretation of the results of the digital recording. The objects of registration / investigation typically include anthropogenic or natural features of the earth's surface. An instance of digital registration involves the interaction of a sensor in the digital device, a physical thing measured and a digital object output which encodes certain properties of that object at the time of registration. Digital Process Units should be used to record digital measurement activities which have quantifiable outputs from mechanical inputs of signals which are carried out towards the end of having a scientifically evaluable measurement output. Therefore, someone sketching an object, typing an observation in a note on a tablet etc ARE NOT instance of Digital Process Unit because they do not use sensors from a machine that automatically capture signals from a physical reality and transfer them into a digital form that can be used to interpret that reality based on knowledge of interpretation of the relevant signal and the physics etc. that are relevant for interpreting it.

An instance of digital process unit comes into existence on the commencement of the registration procedure and is on-going so long as the operators were engaged in the purposeful action to produce a particular dataset. The instance of digital process unit ends upon successful execution of the registration process or abnormally if the registration is fatally interrupted by an incidental condition or the general abandonment of the process by the actors engaged in the registration.

Typical kinds of digital process unit include LIDAR scanning, photogrammetry, spatial recording via Total Station or drone inter alia.

**Examples:**

The colour-calibrated photographing of the objects in material sample 1101.01 from the Raganello Basin Survey.

The LIDAR scanning session of the surface of area 1 of survey project SCIP.

**In First Order Logic:**

$U5(x) \Rightarrow S2(x)$

$U5(x) \Rightarrow S19(x)$

## U6 Material Sample

**Subclass of:**

E18 Physical Thing

S13 Sample

**Scope note:**

This class comprises one or more archaeologically relevant objects, such as fragments of pottery, lithics, etcetera, typically collected from a Survey Surface Unit (U4) in an instance of Survey Collection Activity (U2). The material sample is considered potentially indicative of aspects of the identified material substantial from which they have been removed, providing information regarding its past use, material makeup etc. The substance of the material sample is one or more material objects that have a designated provenience from a particular physical area.

Instances of Material Sample come into being upon the successful completion of a Collection Activity U2, and may later be differentiated into notional or physical collections of objects on the basis of further classification activities. For example, the material sample originating in a particular U2 Collection Activity can be classified into material classes, ware types, fabric group etcetera. These can, but do not have to be physically separated and stored from each other. Material Samples cease their existence when they are intentionally discarded or when it is no longer possible to reconstitute them from their constituent parts (e.g., when objects are removed from their container without retaining their identity).

**Examples:**

A bag containing sample 1011.01 from the Raganello Basin Survey

A bag containing the feature sherds from sample 1011.01 from the Raganello Basin Survey

The African Red Slip ware objects contained in sample 1011.01 from the Raganello Basin Survey

**In First Order Logic:**

$U6(x) \Rightarrow E18(x)$

$U6(x) \Rightarrow S13(x)$

## U7 Fabric

**Subclass of:**

E55 Type

**Scope note:**

This class comprises types of groupings of pottery as established by appropriate experts on the basis of visual macro- and/or microscopic inspection of the clay matrix and inclusions. Fabric group types are declared in order to reflect characteristics of the raw materials used as well as the manufacturing procedures adopted for the creation of groups of pottery materials. A pottery fabric type can therefore be tied to specific production locations. They may be modified by post-depositional processes, which introduces uncertainty in the type assignment rather than a change of type. The substance of an instance of Fabric is a conceptual classification created for scientific analysis.

An instance of Fabric comes into being upon its declaration and continues to exist thereafter even if disproven or superseded, so long as it remains an object of discourse in scientific literature.

**Examples:**

Segni Survey fabric 18

Campanian 'Black Sand' fabric as defined in <https://doi.org/10.5284/1028192>  
([https://archaeologydataservice.ac.uk/archives/view/amphora\\_ahrb\\_2005/cat\\_fab.cfm](https://archaeologydataservice.ac.uk/archives/view/amphora_ahrb_2005/cat_fab.cfm))

**In First Order Logic:**

$U7(x) \Rightarrow E55(x)$

## U8 Function

### Subclass of:

E55 Type

### Scope note:

This class comprises types of groupings of objects according to their presumed function as determined by appropriate experts on the basis of the object's shape, fabric and other properties. Function typologic groupings are often hierarchical, for example grouping baking trays and cooking pots under kitchen ware. An object may have multiple functions: for example, an amphora may be used for transportation and for storage. Following transformation, it may have secondary functions: for example, a storage vessel sherd may be re-used as an ostrakon. The substance of an instance of Function is a conceptual classification created for scientific analysis.

An instance of Function comes into being upon its declaration and continues to exist thereafter even if disproven or superseded, so long as it remains an object of discourse in scientific literature.

### Examples:

Storage

Cooking

Architectural element

### In First Order Logic:

$U8(x) \Rightarrow E55(x)$

## U9 Ware

### Subclass of:

E55 Type

### Scope note:

This class comprises types of groupings of ceramic objects (pottery, terracottas and building materials) according to their visual characteristics as determined by appropriate experts on the basis of the object's combined compositional characteristics (U7 fabric) and manufacturing techniques (slip, finish, use of potter's wheel). In addition, wares are often characterised by a specific suite of U10 shapes. Ware groupings are often hierarchical (e.g, African Red Slip Ware



may be subdivided into ware groups A, B, C and D). The classification of wares depends to varying degrees on different aspects of the object; for example, “black gloss ware” is identified solely on the basis of its dark slipped surface, whereas “impasto chiaro sabbioso” is defined on the basis of its typical colour and inclusions (e.g. its fabric). The substance of an instance of Ware is a conceptual classification created for scientific analysis.

An instance of Function comes into being upon its declaration and continues to exist thereafter even if disproven or superseded, so long as it remains an object of discourse in scientific literature.

**Examples:**

Black Gloss ware as defined by the Getty Art and Architecture Thesaurus online  
([https://www.getty.edu/vow/AATFullDisplay?find=ware&logic=AND&note=&english=N&prev\\_page=1&subjectid=300387491](https://www.getty.edu/vow/AATFullDisplay?find=ware&logic=AND&note=&english=N&prev_page=1&subjectid=300387491))

Internal slipped ware (a subgroup of coarse wares)

**In First Order Logic:**

$U9(x) \Rightarrow E55(x)$

## U10 Shape

**Subclass of:**

E55 Type

**Scope note:**

This class comprises types of groupings of specific ceramic forms that can be used by appropriate experts to categorise individual objects, fragmented or not. The Shape declaration is based on the morphological characteristics (curvature, thickness, position and type of decoration) of an ideal object deduced either from many typical instances or reconstructed from knowledge of vessel parts when intact exemplars do not exist or are insufficient to ground the positing of a Shape. Shape groupings are often hierarchical, for example grouping ‘one-handled cups’ and ‘large cups’ under cups, or cups and bowls under open vessels. Different shapes are more or less readily identified: In some cases simple wall fragments can be assigned the shape ‘dolium’ based on their thickness, in other cases rim or base fragments of a very specific shape can still belong to different shapes (e.g., a jug or jar, cup or bowl). The substance of an instance of Shape is a conceptual classification created for scientific analysis.

An instance of Shape comes into being upon its declaration and continues to exist thereafter even if disproven or superseded, so long as it remains an object of discourse in scientific literature.

**Examples:**

Amphora

Cup

Jar

**In First Order Logic:**

$U10(x) \Rightarrow E55(x)$

## U11 Vessel Part

**Subclass of:**

E55 Type

**Scope note:**

This class comprises internationally agreed types of vessel parts assigned by appropriate experts to individual objects, fragmented or not. The Vessel Part declaration is based on the morphological characteristics (curvature, thickness, surface finish) of that object and may aid in the identification of vessel shape (U10). Vessel part groupings are often hierarchical, for example grouping 'ring bases' and 'flat bases' under bases. The substance of an instance of Vessel Part is a conceptual classification created for scientific analysis. An instance of Shape comes into being upon its declaration and continues to exist thereafter even if disproven or superseded, so long as it remains an object of discourse in scientific literature.

**Examples:**

Base

Shoulder, as defined by the Getty Arts and Architecture Thesaurus online:

[https://www.getty.edu/vow/AATFullDisplay?find=shoulder&logic=AND&note=&english=N&prev\\_page=1&subjectid=300203465](https://www.getty.edu/vow/AATFullDisplay?find=shoulder&logic=AND&note=&english=N&prev_page=1&subjectid=300203465)

Rim

**In First Order Logic:**

$U11(x) \Rightarrow E55(x)$

# crmsurv ongoing Property Declarations

The properties are comprehensively declared in this section using the following format:

- Property names are presented as headings in bold face, preceded by unique property identifiers;
- The line “Domain:” declares the class for which the property is defined;
- The line “Range:” declares the class to which the property points, or that provides the values for the property;
- The line “Superproperty of:” is a cross-reference to any subproperties the property may have;
- The line “Quantification:” declares the possible number of occurrences for domain and range class instances for the property. Possible values are: one to many, many to many, many to one. Quantifications are presented in UML format and in ER format (used by the CIDOC CRM);
- The line “Scope note:” contains the textual definition of the concept the property represents;
- The line “Examples:” contains a bulleted list of examples of instances of this property.

## **UP1 has observation affecting parameter (is observation affecting parameter for)**

### **Domain:**

S4 Observation

### **Range:**

E55 Type

### **Scope note:**

This property describes the effects of some classified category of affective parameter, documented as an instance of E55, on an instance of S4 Observation. It describes how different parameters (such as vegetation cover, sunlight, ..) affect the quality of different kinds of observations made during an instance of S4 Observation.

### **Examples:**

The medium vegetation cover observed during the surveying of unit 2004 of the Nettuno Survey

The overall visibility on the site of Ad Medias estimated at 90% during the initial survey by the PRP in 2012.

**In First Order Logic:**

$UP1(x,y) \Rightarrow S4(x)$

$UP1(x,y) \Rightarrow E55(y)$

## **UP2 surveyed (was surveyed by)**

**Domain:**

U3 Survey Process Unit

**Range:**

U4 Survey Surface Unit

**Scope note:**

This property relates an instance of U3 Survey Process Unit to a particular instance of U4 Survey Surface Unit which is both its place and object of activity. A single location / U4 Survey Surface Unit may be surveyed by multiple different U3 Survey Process Units.

**Examples:**

The systematic field walking that took place in unit 2004 of the Nettuno Survey

The systematic survey of the site of Thespieae during the Boeotia survey

**In First Order Logic:**

$UP2(x,y) \Rightarrow U3(x)$

$UP2(x,y) \Rightarrow U4(y)$

## **UP3 collected (was collected by)**

**Domain:**

U2 Survey Collection Activity

**Range:**

A6 Group Declaration Event

**Scope note:**

This property relates an instance of U2 Survey Collection Activity to the U6 Material Sample Unit that it collected. It describes the act of collecting a set of objects from a Surface Survey Unit according to a given procedure, as part of a Survey Process Unit.

**Examples:**

The collecting of sample 200401 from unit 2004 in the Nettuno Survey

**In First Order Logic:**
$$UP3(x,y) \Rightarrow U2(x)$$
$$UP3(x,y) \Rightarrow A6(y)$$