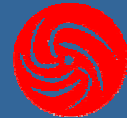




STACHEM Project



MIDDLE EAST TECHNICAL UNIVERSITY

**CENTRE FOR RESEARCH AND ASSESSMENT OF THE HISTORIC ENVIRONMENT
(METU-TAÇDAM)**

**CREATING DIGITAL DATABASE FOR
ARCHAEOLOGICAL HERITAGE MANAGEMENT IN
TURKEY,
METU-TAÇDAM PROJECTS AS A CASE STUDY**

STACHEM - 2009
Paestum, ITALY

Prof. Dr. Numan TUNA

Brief History of METU-TAÇDAM

- ❑ In 1966, scholars from various universities and scientific institutions of Turkey joined together under the leadership of the former president of Middle East Technical University, Mr. Kemal Kurdaş to establish a research institute to undertake the Keban Project.
 - ❑ After 1975, the project extended the study area to include the Lower Euphrates Region.
 - ❑ While the archaeological sites within METU campus was being excavated, the University Museum was established for the dissemination of information revealed by excavations and the display of artefacts for public.
 - ❑ Re-structured in 1995 as a Centre of Research and Assessment of the Historic Environment (TAÇDAM) continued its original mission: to motivate undertakings of salvage archaeology and documentation of historical environment by means of the most advanced methods and techniques for those areas under risk.
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Abstract

- The establishment of archaeological database studies in Turkey goes back to early 1960's since the joint project launched by the University of Chicago and Istanbul University for the documentation of the inundated areas of dam construction projects in Southeast Turkey. Turkish Ministry of Culture and Turkish Academy of Sciences developed to establish a general standard for core database of cultural heritage with limited success by 2001.
 - However, a standard format and field record had been designed for the field studies to be used in archaeological heritage assessment in digital sense for the first time as a requirement of Baku-Tbilisi-Ceyhan Crude Oil Pipeline Project (BTC P/L Project), Ilisu Dam Construction Project and several other projects by TAÇDAM.
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The Environmental Impact Assessment of the Cultural Heritage

Measures in the Priority Level Assessment of Cultural Entities

- ❑ Today, archaeological heritage is under the varying threat caused by the merged mutual impact of natural circumstances and human factor. Particularly in developing countries like Turkey, this situation has gained a dramatic pace of development. Together with the increasing pace of urbanization in the last 50 years, new housing and work sections as well as roads demand larger urban areas, whereas the more intensive use of the older settlement areas with modern technology leads to the total destruction of the cultural layers beneath. The deeper cultivation of the agricultural soil as a result of modernization in agriculture, the more efficient use of the natural resources, mining, irrigation systems, and demands as such, leads to the loss of possible archaeological heritage in an irreversible manner, leaving devoid of even the knowledge pertaining to its presence.
 - ❑ As opposed to such circumstances, in order to document the archaeological heritage, to develop different conservation policies as per priority levels, "salvage archaeology" studies have been implemented in European countries since 1960s. At the basis of the recently developing protection understanding in the world lies the predicament that all remnants and residues pertaining to past are considered data and thus all types of data should be documented without a selective approach. As all archaeological data provide a unique source of information as much as presenting irreversible and easily degradable characteristics, conservation by documentation has been a fundamental concept particularly in the field of salvage archaeology.
 - ❑ Hence, as per the integrated conservation approach stated in the provisions of "European Convention on the Protection of Archaeological Cultural Heritage" signed in Malta by the member countries including Turkey in the year 1992, the principle of conservation by documentation should be taken into consideration in the implementation of the large scale projects of public benefit. Accordingly, at all levels of plan-project-program studies, it is envisaged the cultural heritage survives in an integrated manner -with minimum adverse effect- within the modern, living environment.
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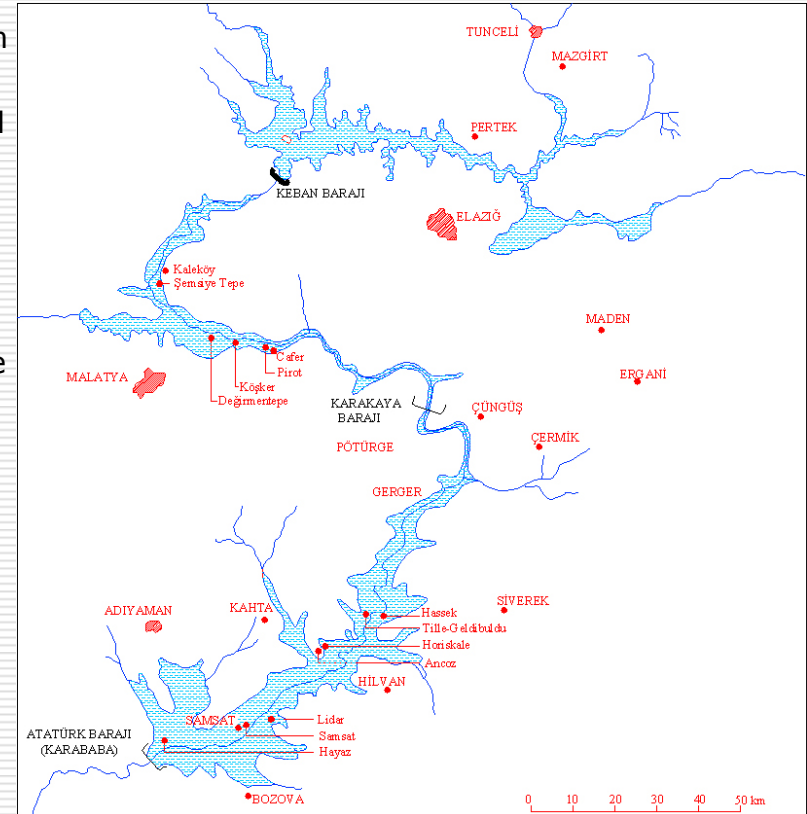
The Environmental Impact Assessment of the Cultural Heritage

Measures in the Priority Level Assessment of Cultural Entities

- Regarding the practice implemented in Turkey, on the other hand, the archaeological sites as well as immobile cultural assets are registered by the Councils of Cultural and Natural Entities under four different protection levels according to the cultural value they contain and their problems, within the framework of the Law No. 2863 and related regulations. Among all, those where the historic settlement has survived till today are registered as "urban archaeological site", while the rest comprises of the archaeological areas that have been considered for conservation under three priority levels, where no modern settlement is observed in general.
 - For the first priority level archaeological sites, no other physical intervention is prescribed except for the archaeological excavations and site arrangement.
 - For the archaeological sites of second priority level, which are considered to have as much archaeological potential as the first priority level sites, the efforts concentrate on the elimination of the modern settlement topping these sites and on the protection of the site integrity.
 - The third priority level archaeological sites, where not much archaeological potential is observed, are considered as the immobile cultural assets, in acknowledgment of setting the balance between protection and utilization in the projects for public good in particular, after the archaeological documentation to be conducted prior to any such project, that do not to require any *in situ* protection.
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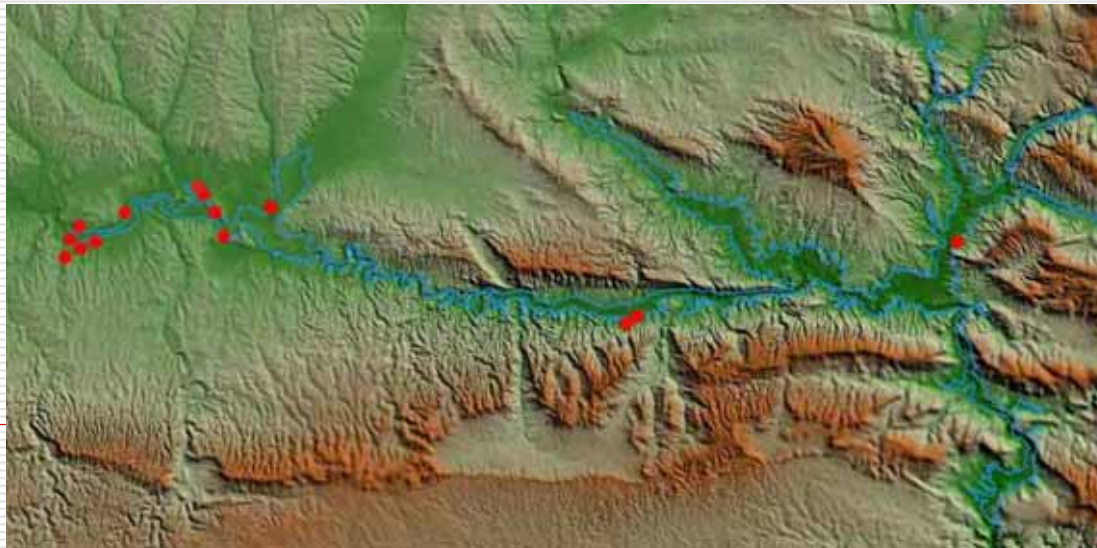
The Archaeological Cultural Heritage Management of Inundated Areas of Ilisu Project

- Among all the dams that are planned to be built over the Euphrates and Tigris rivers as part of the long-term regional development plan in the Southeastern region of Turkey (Southeastern Anatolia Project - Güneydoğu Anadolu Projesi, GAP), Ilisu Dam, located over the Tigris River in the province of Mardin, is regarded to be the most substantial one, which is planned for energy generation. Southeastern Anatolia, and Ilisu Dam Reservoir area in particular, is one of the least investigated areas in terms of archaeological research.
- Compared to other regions, archaeological studies in this region have started at a relatively late date, first in the province of Diyarbakır by the joint study of Istanbul University and Chicago University in 1963 (Çambel: 1980), then carried on by several scientific institutions in the Keban and Atatürk dam reservoir areas (Özdoğan: 1977; Serdaroğlu: 1977). Nevertheless, compared to the neighbouring countries and regions, and more importantly, when the archaeological potential of the Southeastern Anatolia is taken into consideration, it is observed that the existing archaeological studies are not at a sufficient level.
- In order to prepare a database which ultimately would serve as the basis for an archaeological impact assessment in consideration of revealing the archaeological potential in the Ilisu Dam Project reservoir area and reduction of the adverse effects on the archaeological cultural entities, archaeological surveys have been initiated in 1988 under the supervision of Middle East Technical University Center for the protection of Historic Environment, in the light of the previous field surveys previously conducted in the region.

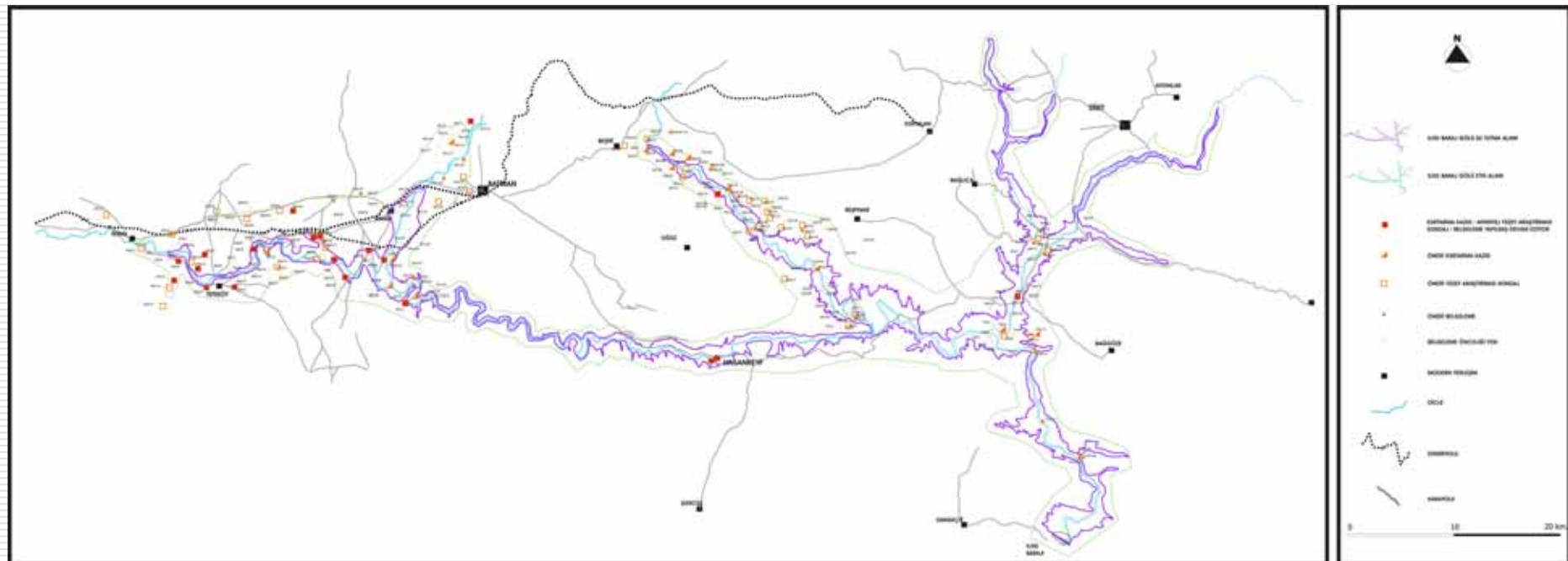


The Scope of the Cultural Heritage Management Plan of Ilisu Dam Area

- Ilisu Dam reservoir area is located in an area encompassing the Bismil district in the province Diyarbakır province as well as the provinces of Batman, Siirt and Mardin. The dam river reservoir area, which shall include the Tigris and its branches Batman Su, Botan and Garzan, extends from Ilisu area, to 50 km. northwest of Cizre, to the close environs of Bismil for some 120 km. It is predicted that the dam reservoir water level shall increase to a maximum of 525 m. of elevation.
- On the other hand, both in the building process of the dam due to the abrasive impact of the dam reservoir, and by means of irrigated agriculture processes to be undertaken in the region afterwards, along with the increasing economic activities and similar developments are expected to create adverse effects over the archaeological cultural entities around the dam reservoir area. Therefore, the work for the documentation of the archaeological cultural entities within the scope of the project should not be limited to the reservoir area only but to be considered to cover a wider extent in a manner that could reveal the cultural impact system as well, which would be expected to exist within natural geographical borders, and at the same time as a contingency against the negative environmental impacts due to rapid development.
- The archaeological field surveys and cultural heritage conservation works planned to be conducted for this purpose cover the band of terrain extending to a level of ca. 750 m contour of first range hills parallel to the river bank, as considered in this work to fall into the scope of the Project impact.



Salvage Project of the Archaeological Heritage of the Ilisu and Carchemish Dam Reservoir (1998-2003)



- The work began in 1998 with two excavations and four surveys. In 1999, this had become a mega international archaeological salvage operation, with four excavations and two surveys and by 2002 had increased to a total fourteen excavations and two survey projects in the Ilisu Area only.

Salvage Project of the Archaeological Heritage of the Ilisu and Carchemish Dam Reservoir (1998-2003)

The Ilisu Project Participants:

- *Ziyaret Tepe - Dr. Timothy Matney, University of Akron*
 - *Gredimse Höyük- Assoc.Prof.Dr. Petr Charvat, The Oriental Inst., Praha*
 - *Kenan Tepe - Prof.Dr. Bradley Parker, University of Utah*
 - *Hasankeyf Lower City - Mardin Museum*
 - *Hasankeyf Upper City – Assoc.Prof..Dr. Ali Uzay Peker, METU.*
 - *Salat Tepe - Assoc.Prof.Dr. Tuba Ökse, Hacettepe University*
 - *Aşağı Salat - Dr. Yücel Şenyurt, Gazi University*
 - *Gricano Tepe - Dr. Andreas Schachner, L.Maximilians Üniv., Münih*
 - *Müslüman Tepe - Dr. Eyüp Ay, Kırıkkale University*
 - *Kortik Tepe - Assoc.Prof.Dr. Vecihi Özkaya, Dicle University*
 - *Kavuşan Tepe - Assoc.Prof.Dr. Gülriz Kozbe, Ege University*
 - *Hakemi Use Tepe - Assist.Prof.Dr. Halil Tekin, Hacettepe University*
 - *Yenice Yanı 1 - Dr. Susan Pollock, Univ. Of Binghamton, USA*
 - *Türbe Höyük - Assist.Prof.Dr. Haluk Sağlamtemur, Ege University*
 - *Hirbemerdon Tepe - Dr. Nicola Laneri, Univ. of Naples, İtalya*
 - *Gre Keleke - Assist.Prof.Dr. Aslı Erim Özdoğan, İstanbul University*
 - *Gre Şavo - Assoc.Prof.Dr. Gülriz Kozbe, Ege University*
 - *Salat Cami Yanı - Dr. Yutaka Miyake, Tokyo University*
 - *Paleolithic Survey. - Assoc.Prof.Dr. Harun Taşkiran, Ankara Univ., D.T.C.F.*
 - *Caravansarai Survey - Prof.Dr. Aysıl Yavuz, METU*
 - *Garzan/Bothan Survey. - Dr. Jale Velibeyoğlu, METU-TAÇDAM*
 - *Survey of Classical Settlements .- Dr. Gürol Barın, Dicle University*
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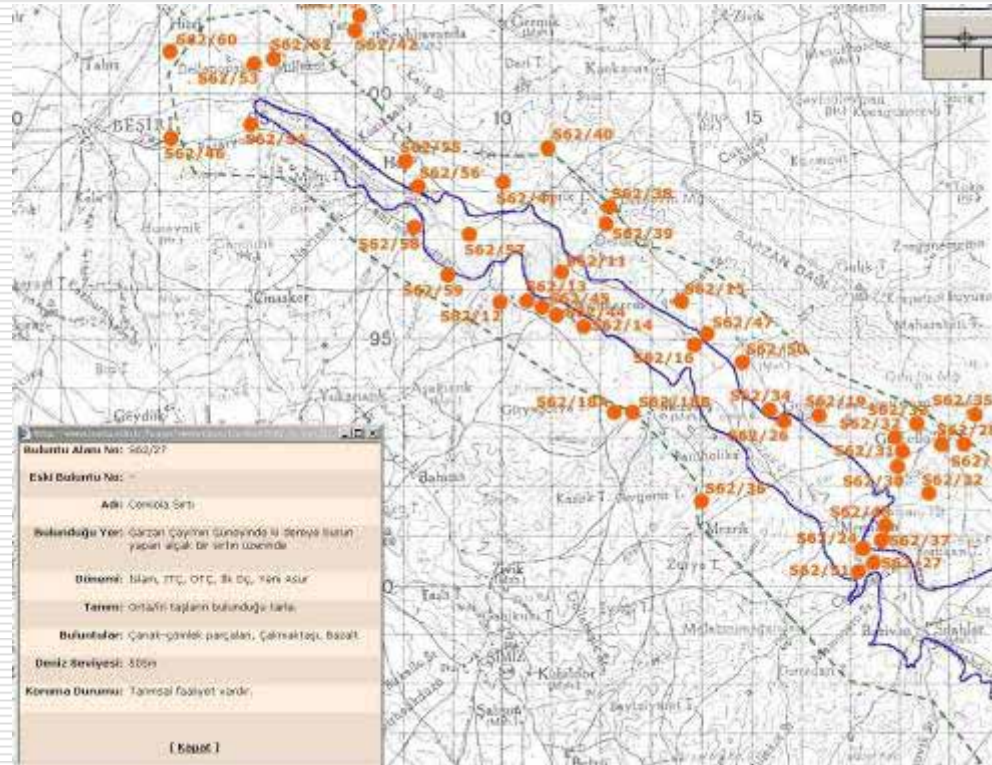
Digital Documentation System for the Archaeological Heritage of Inundated Areas of Ilisu Dam Project

- For the formation of an archaeological/ cultural sites archive in an electronic media, for the acquisition and coding of a unique identity number by each archaeological site, a system based on geographical basis is the most appropriate. For this purpose, a grid system entirely covering Turkey is used, which passes through each 15" latitude and longitude related to the country's web of coordinates.
 - Each of the orthogonal units founded according to this system acquires an identity number labeled with a letter from north to south, and a number from west to east. Accordingly, the archaeological/ cultural sites established within each unit (standard spatial units measuring 18 x 22km.) having a determined identity no. are coded by enumeration as per their respective order of detection. For instance, S60 orthogonal unit in the project area implies the unit located between 37°45" and 38°00" latitude, 40°45" and 41°00" longitude. Ziyarettepe Settlement Mound, which is established as the second archaeological site in this area, is coded as S60/2.
 - As per the standard research units used in the cultural inventory works within the scope of Ilisu Project, the distribution of the 1/25 000 scale maps of General Directorate of Maps found in each unit is as follows:
 - S59: M45-a1,a2,a3,a4
 - S60: M45-b1,b2,b3,b4
 - S61: M46-a1,a2,a3,a4
 - S63: M46-b1,b2,b3,b4
 - S63: M47-a1,a2,a3,a4
 - S64: M47-b1,b2,b3,b4
 - T61: M46-d1,d2,d3,d4
 - T62: M46-c1,c2,c3,c4
 - T63: M47-d1,d2,d3,d4
 - T64: M47-c1,c2,c3,c4
-

Digital Documentation System for the Archaeological Heritage of Inundated Areas of Ilisu Dam Project

- Publications regarding the preliminary results of the field surveys headed by D. Algaze between the years of 1988-90 have been used as the basic data in the works for the creation of a GIS supported cultural inventory. However, as the information in these publications pertaining to sites were not provided with adequate level of detail, data input had to be incomplete for most centers.
 - The archaeological database that has been predicated upon in the evaluation of the archaeological potential of the Ilisu Dam Project impact area in this study has been compiled from all archaeological field surveys concerning the region, and the results of the sub-projects managed by METU-TAÇDAM particularly after the year 1988 in the Ilisu Dam Reservoir area.
 - The database that has been formed according to our understanding of archaeological finding location inventory system adopted by ourselves has been provided in a comparative fashion with the inventory numbers and location names given to the archaeological finding areas and monuments by different researchers
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Digital Documentation System for the Archaeological Heritage of Inundated Areas of Ilisu Dam Project



BULUNTU YERİ FİŞİ

Adı: Kod No: Harita pelte no:

Tarihi, önemi: Araştırma tarihi:

Araştırma başkanı: Araştırma üyeleri:

Yeri: İlçe: Köyü: Mahalle/Mezra:

Koordinatlar:

Bilgi:

Dolgu Cevre:

Yer Yapısı:

(Toprak tipi ve dokusu)

Buluntu alanının tanımı (yüzey şekli, anıyın, kültür dolgu ve yapı kalıntıları durumu):

Dirta ve in taşların bulunduğu tarlada. Kesitte az taş ama kerpiç ve kıl dolgu. Yerli, dolgu alan Garzan Çay'ı ve yola doğru uzanıyor. B alanının B'inde taş obekleri arasında bazalt taş ve çölün taş parçaları. Taş obeklerini çevresinde

Boyutları: N-S: E-W: Dolgu Kalınlığı:

İnsan etkisi ve görünümündeki kullanımı:

Tarile sırasında ve koruma çayın etkisiyle oluşan erozyon

Araştırma yöntemi:

Etek ve yamaç sürümüne tarla A alanı, pamuk tarlası B alanı olarak toplandı.

Yüzey buluntuların (buluntaların, tarihleri):

Erken Bronz, Orta Bronz, Erken Demir Çağ, Habs, İslam (Buluntu Tarihi: Çp, Çt(1), bazalt

Yayın:

Kroki:

Değerlendirme:

Diğer buluntalar:

Koruma Torba No:

Çizim No:

Foto No:

Seydam No:

Ölçek:

- ❑ Archaeological Baseline Studies: Identified sites at Garzan tributary area

Archaeological Heritage Assessment of the Inundated Areas of Ilisu Dam Project

- Archaeological remains are extremely diverse by their state of protection and the amount of information they contain. In the evaluation of the potential that the archaeological sites contain, such data as the period represented, rareness, the state of protection, site integrity, and cultural diversity are taken into consideration.
- In order to reveal the archaeological cultural potential in Ilisu Dam Reservoir, a detailed evaluation study has been carried out, taking into consideration the existing data published and particularly the updated results of the archaeological field surveys conducted by METU TAÇDAM since 1998, including the density of findings, the areas of expansion, their states of protection and their place vis-a-vis palaeo-geographical contexts for the 237 archaeological cultural sites determined through the fieldworks within the scope of the project.
- Within this context, among all the sites established within the scope of the Project, particularly settlements that contain several cultural layers such as settlement mounds, have been defined as first priority level sites to be protected/ documented as they are immobile cultural assets that require to be protected/ documented *in situ*.
- An amount of 110 first priority sites have been determined in the project impact area. Compared to the sub-regions, the Bismil-Batman section, where extends over a larger region, is richer in terms of the number of first priority archaeological sites.

Sub-Region	First Priority	Second Priority	Third Priority	TOTAL
Bismil-Batman	32	55	23	110
Garzan	19	55	9	83
Botan	16	18	10	44
Total Sites	67	128	42	237

Significance assessment of archaeological sites by sub-regions

Archaeological Heritage Assessment of the Inundated Areas of Ilisu Dam Project

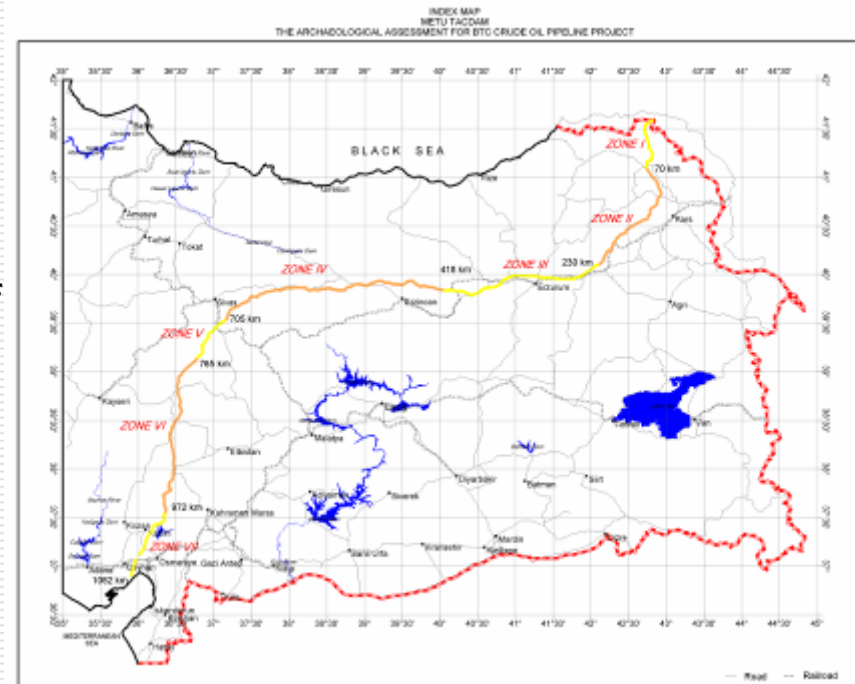
- Second priority site level has been suggested for the cases where only insufficient amount of data could be collected due to the restricted time frame in the fieldwork or are not easily defined. During the fieldworks conducted, a number of 128 archaeological sites have been established over the Project impact areas; as the fieldworks conducted in the region are not at a sufficient level and thus, the boundaries of the sites have not been determined, the number of second priority level sites is considerably high.
- The third priority level sites in general *in situ* have been defined as the sites which do not require to be protected, but are adequate to be protected by documentation, and which are of the lowest level of priority. In the archaeological fieldworks / out of a total of 42 archaeological sites established within the project impact area have been, the third priority level sites have been determined mostly as sites in the form of flat settlements that do not have a high archaeological potential but are to be protected by documentation in the cases where protection-utilization balance has to be taken into consideration.
- Provided that the archaeological potential they contain is documented and the insufficient level of the cultural inventory regarding the Ilisu Dam Reservoir is completed, there is no doubt that we shall obtain invaluable rich data that shall require for the rewriting of cultural history regarding the areas at stake.

Sub-Region	First Priority	Second Priority	Third Priority	TOTAL
Bismil-Batman	32	55	23	110
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Total Sites	67	128	42	237

Significance assessment of archaeological sites by sub-regions

Archaeological Research and Assessment for Baku Tbilisi Ceyhan Crude Oil Pipeline Project (2001-2002)

- This study aims to provide the archaeological potential of the areas in Baku-Tbilisi-Ceyhan Crude Oil Pipeline route within the Republic of Turkey's part between from Posof to Yumurtalık, 500 m wide, 1062 km long corridor during the detailed engineering phase and to propose cultural heritage management plan by minimizing or eliminating adverse effects of BTC Crude Oil Pipeline for optimal solutions in such an ambitious intervention.
- Archaeological research and assesment for BTC Crude Oil Pipeline Project has been carried out to meet the requirements of European Archaeological Heritage Management Convention and World Bank procedures.
- In this connection, the study represents first attempt to set out according to the standards mentioned above.



Archaeological Research and Assessment for Baku Tbilisi Ceyhan Crude Oil Pipeline Project (2001-2002)

- The app. 1070-km long 500-m wide pipeline corridor (including larger impact zone extending up to 2 km wide) has been divided into 7 main zones as follows; each distinctive geographical unit of which has been assigned to the archaeological field teams to be surveyed:

■ Zone 1	Posof – Ardahan	00 km–70 km.
	Dr. Sinan KILIÇ, 100.Yıl University	
■ Zone 2	Ardahan – Horasan	71 km–230 km.
	Dr. Nicola LANERİ, University of Naples, Italy	
■ Zone 3	Horasan – Çayırli	231 km–418 km.
	Dr. Haluk SAĞLAMTEMUR, Ege University	
■ Zone 4	Çayırli – İmranlı	419 km–705 km.
	Dr. Gülriz KOZBE, Ege University	
■ Zone 5	İmranlı – Pınarbaşı	706 km–764 km.
	Dr. Aslı ÖZDOĞAN, İstanbul University	
■ Zone 6	Pınarbaşı – Andırın	765 km–972 km.
	Dr. Aslı ÖZDOĞAN, İstanbul University	
■ Zone 7	Andırın – Yumurtalık	973 km–±1070 km.
	Dr. Sinan KILIÇ, 100.Yıl University	
 - This segmentation has been done regarding the seasonal & climactic conditions and temporal constraints. The archaeological teams have been delivered to the zones. Therefore, the archaeological teams have been delivered to the zones and started their surveys from northern parts above on the route, where mountainous topography and hard seasonal conditions are observed. The respective zones of field work teams along BTC P/L Project Route can be found shown on the index map.
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Archaeological Research and Assessment for Baku Tbilisi Ceyhan Crude Oil Pipeline Project (2001-2002)

Establishing Database of Archaeological Assessment

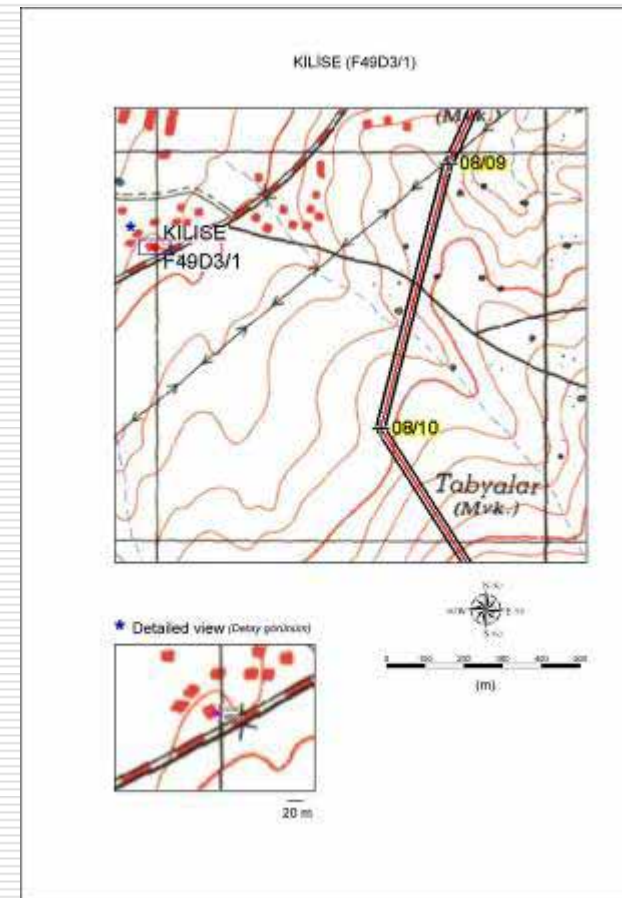
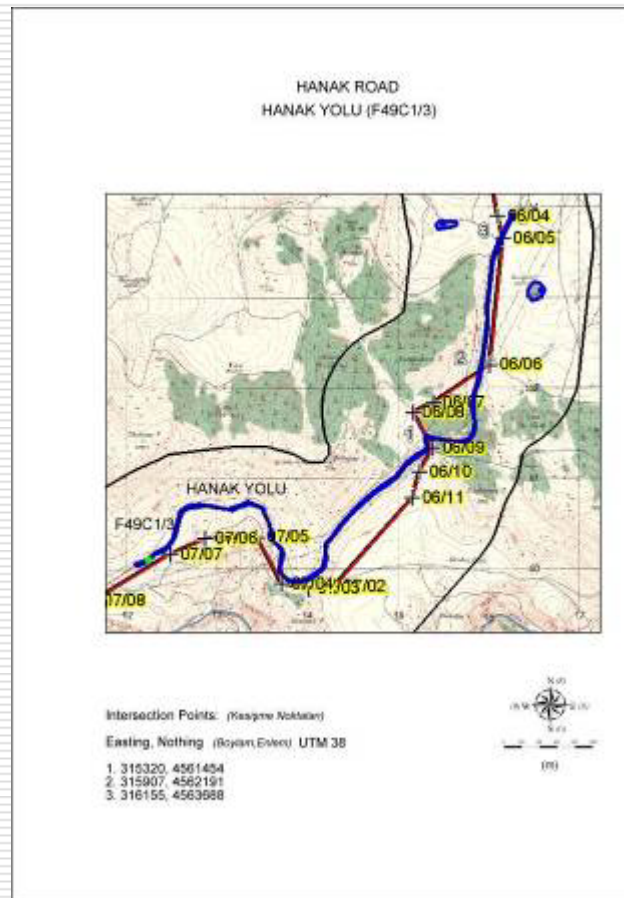
- ❑ A standard format and field record have been designed for the field studies to be used in constructing the basic database of archaeological assessment.
 - ❑ Information seminars have been arranged and meetings were held with the teams involved in field studies about the format and procedures to be followed before they have been mobilized. Main concern in these seminars was the implementation of the pre-designed format in field studies in order to achieve a similar minimum standard that would allow fieldwork data to be evaluated altogether.
 - ❑ As mentioned above, certain primary standards concerning the type, format and content of data to be had been established for implementation and assessment of the archaeological field studies. Therefore, an "Archaeological Site Record Sheet" had been prepared. All the input required for the GIS database, together with the characteristics demonstrating the expansion and intensity of the archaeological sites, and their geographical environs had been recorded in these sheets. The data input and assessments in GIS studies have been implemented in Arc Info and ESRI Shape formats.
 - ❑ Archaeological Site Record Sheet is composed of three parts.
 - The first part includes all basic data required for the GIS Database, Site Name, Site Number, Province-County-Village-Zone, IP Between, UTM Zone and GPS Coordinates (Easting/ Northing).
 - Second part is on site description, which aims at collecting all information for the assessment of archaeological sites with the following variables: Settlement Type, Period, Dimensions, Area, Site Location and Description.
 - The last part on mitigation measures and suggestion purposes has been designated specifically for BTC P/L
 - ❑ Project Environmental Impact Assessment according to these parameters: Priority, Distance to the Pipeline, Evaluations/ Suggestions. Appendix 3 includes all the Record Sheets of the sites detected in field studies.
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Archaeological Research and Assessment for Baku Tbilisi Ceyhan Crude Oil Pipeline Project (2001-2002)

Establishing Database of Archaeological Assessment

- In order to ease the data input process and establishment of shared database later on, a certain standard terminology has been used and the archaeological studies and database have been organized according to the internationally accepted standards which were firstly used by Istanbul University and University of Chicago in 1960s and developed by TÜBA in 2001.
 - The most important components, site numbers and site description, should be explained first. In the field studies, the 1/25.000 scale map sheet numbers, enumerated according to the *Local Coordinate System of Turkey*, have been used for the coding of the sites; the archaeological sites within these 1/25.000 scale map sheets of the field of study, take an additional number according to their order of detection.
 - For instance, the first detected archaeological site on the 1/25.000 scale map sheet with No: L36-c3 is coded as L36-c3/1. For all the archaeological sites detected in the field studies besides the names used in the map and/or the historical names learned from local people, the cultural inventory number had also been used in coding; e.g. Tetikom Tepesi – I46B2/2.
 - Regarding the distribution of the archaeological finds mentioned in the related with the zones the settlement types has been defined as follows:
 - Old Settlement, Seasonal Settlement, Flat Settlement, Settlement Mound, Classical Site, Necropolis, Graveyard, Monumental Tomb (Tomb -Türbe-, Kurgan, Cromleh, Megalithic Monument, Tumulus), Castle, Watchtower, Church, Ruins, Han, Bridge, Old Military Trench, Ancient Road, Aquaduct.
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Archaeological Research and Assessment for Baku Tbilisi Ceyhan Crude Oil Pipeline Project (2001-2002)



- ❑ Archaeological Baseline Studies: A sample from Zone-1

Archaeological Research and Assessment for Baku Tbilisi Ceyhan Crude Oil Pipeline Project (2001-2002)

- Aiming at the assessment and cultural heritage management of the impact areas of the app. 1070 km long and 2 km wide corridor of BTC P/L Project route, the archaeological field studies have resulted to document 179 archaeological sites within the areas concerned. Characteristics of these sites identified vary in terms of settlement type, period, archaeological significance and distance to the pipeline and/or associated facilities.
- The archaeological remains differ dramatically from each other in terms of their situation of preservation and the knowledge they contain. The potential of the archaeological sites are determined by the period represented, their scarcity, position of protection, site integrity, cultural variability, etc.
- In order to reveal the archaeological cultural potential of the BTC P/L Project impact areas, a well-detailed documentation of the 179 sites detected in the project fieldwork based on the density of material findings, the area of dispersion and paleo-geographic context, has been accomplished, by using the methods.
- In this context, within the scope of the project the first priority sites has been defined to be the immovable cultural entities which should be preserved in-situ; settlements which consist of several cultural layers like settlement mounds, monumental archaeological sites of Classical period, tumuli because of their particular site authenticity, old cemeteries and tombs for their social and moral values, as well as monumental structures like castles, bridges, aquaducts and Hans. Along the Pipeline route, totally 69 first priority sites have been detected.

	1 st Priority	2 nd Priority	3 rd Priority	TOTAL
Zone 1	8	3	10	21
Zone 2	6	2	20	28
Zone 3	7	7	17	31
Zone 4	7	2	11	20
Zone 5	8	1	3	12
Zone 6	20	2	14	36
Zone 7	13	6	12	31
TOTAL	69	23	87	179

Table: Significance assessment of archaeological sites by zones

Archaeological Research and Assessment for Baku Tbilisi Ceyhan Crude Oil Pipeline Project (2001-2002)

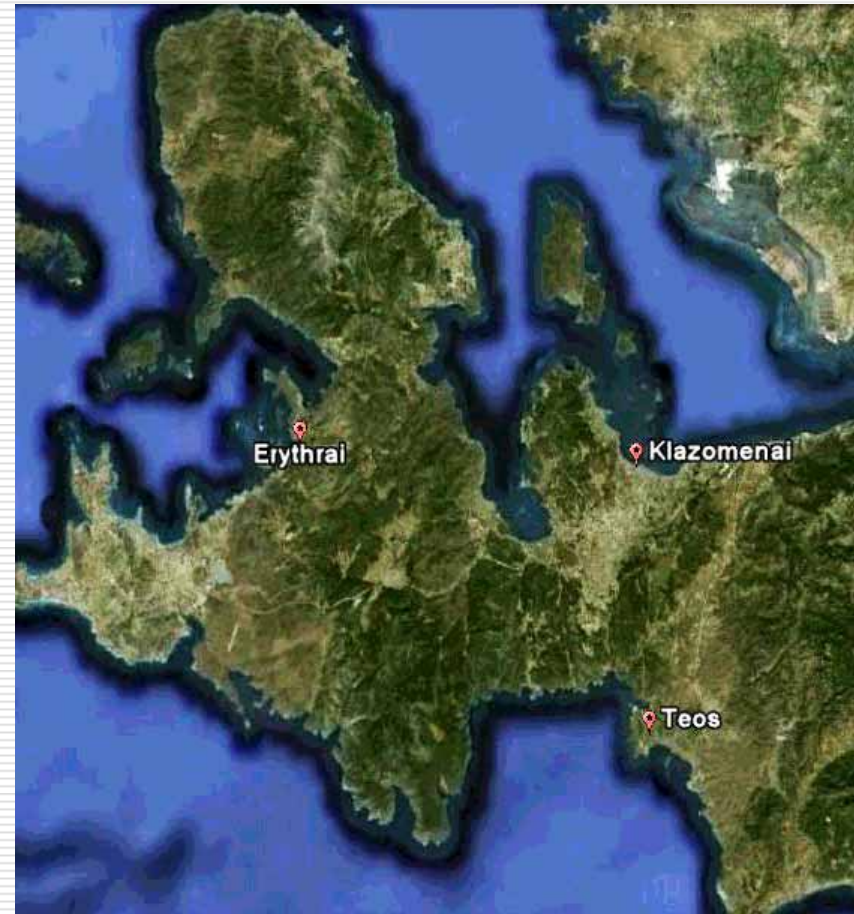
- To estimate the value of a site, information required to determine the potential of values such as historic, scientific, aesthetic, social and economic that are likely to be significant to preserve. Certain criteria such as period, rarity, group value, survival condition, diversity and potential are used to prioritize sites.
- The first archaeological sites should be well protected and no development schemes are allowed. With the second category of archaeological sites, only limited actions permitted on condition that no adverse impact on the cultural resources. The third category of sites may be developed if only necessary archaeological investigations are taken for saving by documentation.

	1 st Priority	2 nd Priority	3 rd Priority	TOTAL
Zone 1	8	3	10	21
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Table: Significance assessment of archaeological sites by zones

Klazomenai and Teos survey project (2006-2009)

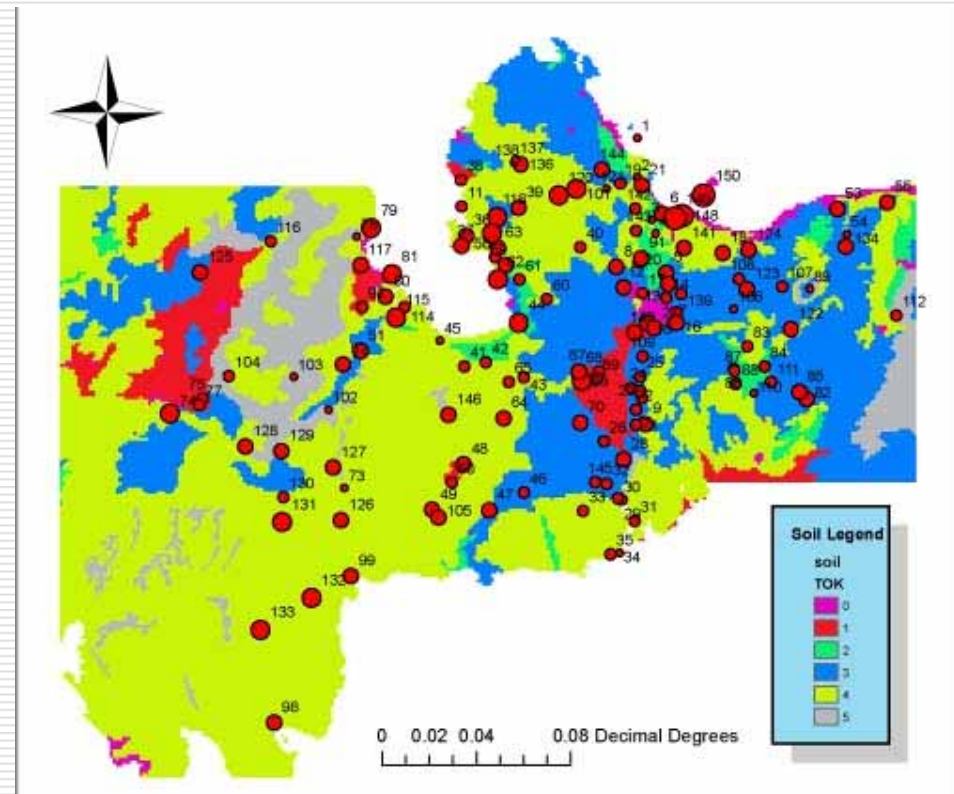
- **Klazomenai and Teos Survey project began in 2006 and supported by;**
 - Turkish Ministry of Culture and Tourism
 - TUBITAK
 - METU, Department of Settlement Archaeology
 - Klazomenai Excavations
- **The primary objects of the project:**
 - Producing information to understand the *settlement history* of Teos and Klazomenai, which are two neighbouring Ionian poleis located on Urla-Çeşme peninsula.
 - Producing a detailed inventory of archaeological sites and cultural heritage.
- **The project seeks to investigate the dynamics and parameters of polis formation process by using a variety of methods:**
 - Extensive survey for developing a Comprehensive inventory of Archaeological sites and cultural heritage.
 - Intensive survey of sampled areas for recording a well defined evidence of human activity and archaeo-geological variables.
 - GIS analysis for understanding the environmental and archaeo-geological dynamics for defining settlement distribution, settlement hierarchy, settlement patterns, land potential and ancient landscape.



Klazomenai and Teos survey project (2006-2009)

Databases:

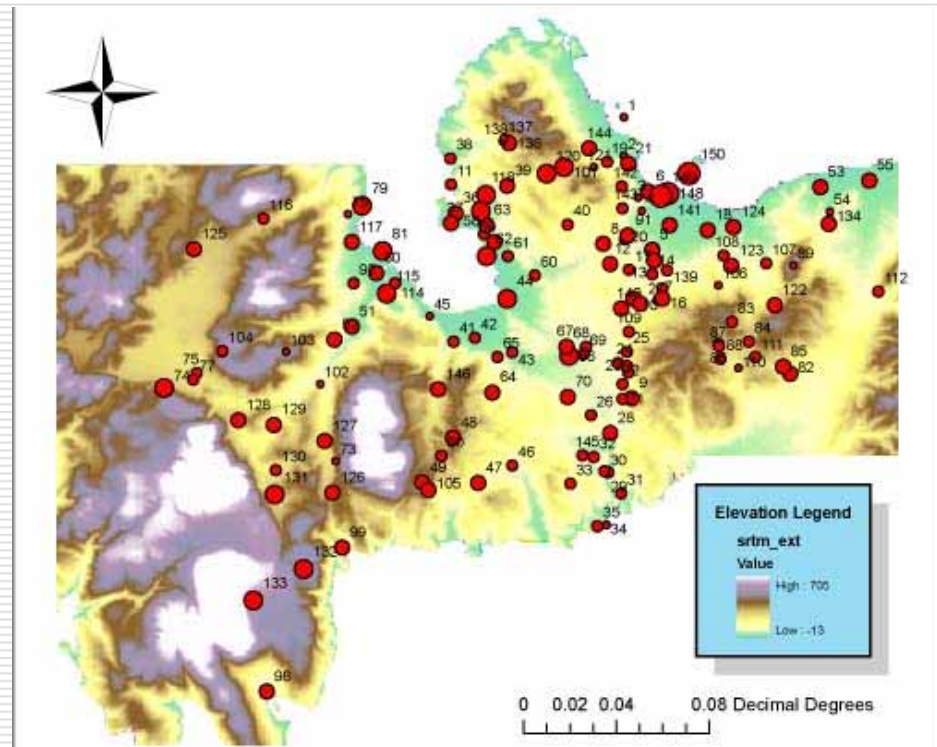
- A **web database** with MySql extension (Klasp-Dignotes ©) is developed for recording a full index of sites discovered by survey.
- The inventory includes name, number, subregion, location, map code, GPS coordinates, ground cover type, size, visibility degree, topographic information, epigraphic information, soil composition as well as related maps, photos, drawings of each site.
- The database is updated at the end of each site work season and attainable through web for each team member for uploading new information.



Archaeological sites on soil map

Klazomenai and Teos survey project (2006-2009)

- A **GIS database** is developed by using Map Info and ArcGIS for recording spatial information in the Digital environment for producing some queries and analyses. Some spatial information of the land, such as slope, aspect, and distance for each site are determined on digital elevation model and
- Mapped by geographical illustrations.
 - For elevation, slope and aspect 90 m. pixel resolution, 16 m. longitudinal SRTM map is used. The slope map used to develop a value range for slope and elevation of the land in total and for each site.
 - The vector soil and rock maps included soil and rock types over 30 grouped into 6 similar types of soil and rock for being able to suggest significant choices for soil and rock features for the settings of sites.
 - GPS coordinates compatible with Turkish national coordinate system are used to map the Archaeological sites.



Archaeological sites on elevation map

Bozburun Archaeological Survey Project: Investigations at the Rhodian Peraea for the Rural Settlement Pattern and Agricultural Economy (2009-)

Sampled Territories of Demes:

Bozburun (Tymnos)
Selimiye (Losta)
Söğüt (Saranda/ Thysannos)
Fenaket (Phoinix)
Bayır (Syrna)



Location of the Study Area



Bozburun Archaeological Survey Project: Investigations at the Rhodian Peraea for the Rural Settlement Pattern and Agricultural Economy (2009-)

□ The Scope of the Project

- defining territorial communities and spatial analysis as to how “demes” were organised in relation to natural environment and man-made features
- social organization of the countryside and planning according to socio-economic and political factors (mainly- early 2nd century B.C)
- Development of rural settlements and self-representation as an independent political Carian League from Archaic to Hellenistic period when it came under Rhodian control



Bozburun Archaeological Survey Project: Investigations at the Rhodian Peraea for the Rural Settlement Pattern and Agricultural Economy (2009-)

GIS Applications:

Basic map operations & spatial data models to understand potential areas suitable for settlement and terracing

□ Registration / Georeferencing process of 1/5000 scaled digital mapping

■ Estimations via polygons:

- area
 - size
 - aspect
 - slope
 - route of ground water
 - carrying capacity of agricultural resources in antiquity
-



STACHEM Project



MIDDLE EAST TECHNICAL UNIVERSITY

**CENTRE FOR RESEARCH AND ASSESSMENT OF THE HISTORIC ENVIRONMENT
(METU-TAÇDAM)**

THANK YOU...

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