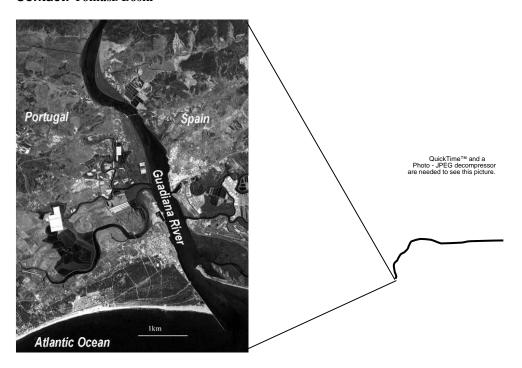
WT 7.11 GUADIANA ESTUARY, PORTUGAL

1. Host Institution: CIMA – Centre of Marine and Environmental Research, Universidade do Algarve **Contact: Tomasz Boski**



2. Guadiana River Estuary is located in the southeast of Portugal and makes a border between Portugal and Spain. The geographical coordinates of the south most point on the Portuguese margin are $37^{\circ}10^{\circ}$ N and $7^{\circ}24^{\circ}$ E

3. Characteristics

Marine System	The Guadiana Estuary is a mesotidal, narrow funnel-shaped body, well mixed for low,
intervite System	summer (XX m3/sec) discharges, but vertically stratified in winter. The mixing zone is within
	the first 10 km from the mouth but brackish conditions may extend 40 km inland. Winter
	discharges delivers vital nutrients to the shelf sea. Since 2002, damming of the river reduced
	drastically this flux. Aquaculture and fisheries are important activities in this area. The wave
	regime is predominantly SW, associated mainly with swell from Atlantic Ocean. The strong
	long-shore current is west-to-east and transports ca 200 000m3/year of sand partially retained
	by groin. Domestic sewage discharge at present is important due to the legal halt of water
	treatment plant.
Watershed	Guadiana is the one of most important rivers on Iberian Peninsula whose total length is 730
waiersnea	km, of which the last 200 make a natural border between Portugal and Spain. Geologically
	the drainage basin of 67 000km2 is much diversified. More than 40 dams store water mostly
	for irrigation purposes (mostly in Spain) and decrease severely the water flow, causing
	eutrophication and sediment starvation along the coast. Forestry and agriculture are the
	principal activities in the Portuguese part of drainage basin. Industrial pollution is not
11 A - 4::4:	important.
Human Activities	The Human activities on the two margins (East – Spanish, West – Portuguese) of the estuary
	are at present distributed in an asymmetric way. The most important activities are indicated
	together with impacts: Agriculture - eutrophication, Aquaculture - effluents, Tourism and
· · · · · · · · · · · · · · · · · · ·	recreation – habitat destruction, fisheries – border conflicts, salt production.
Impact Responses	River discharge reduction (recently-2002 closed Portuguese Alqueva dam) caused nutrient
	enhancement and contributes to the toxic algae blooms. Coastal erosion will become more
	severe.
	Tourism development and urbanization have invaded natural habitats and added untreated
	sewage discharge.

4. Policy

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Policy issues	The damming of Guadiana River eliminated from coastal waters the turbid plumes, which	
	support the plankton blooms and the planktivorous fish stocks. It aggravated the	
	eutrophication impacts. The so called « minimal ecological discharge » is negotiated with	
	water managing authorities in order to keep these issues controllable.	
Policy changes	On the Portuguese side of the estuary, the Natura 2000 zone was declared and effectively	
	stopped the urban/tourism development. However the adjacent zone is under strong pressure	
	from tourism on coastal fringe and golf fields inland. The latter are menacing the Natural	
	sanctuary area (Castro Marim salt marsh natural reserve of 2400ha, RAMSAR site).	
	On the Spanish side, the construction of a tourist-urban development for ca 30,000 people	
	under completion changed dramatically the land use policy, invaded the agriculture	
	dominated land and salt marshes which were covered by imported earth and transformed into	
	the golf fields.	

5. Stakeholders and Institutional Governance

Major	Ria Formoza Natural Park - Castro Marim Natural Reserve, Municipality of Castro Marim
organisations	(Portugal), Municipality of Vila Real de Santo António, (Portugal) Municipality of Ayamonte
	(Spain), Regional Port Authority
Other leadin	The association of solar pond salt producers, Confederação Portuguesa das Associações de
organisations	Defesa do Ambiente.

6. Partner Collaboration

S	SPICOSA	None
F	Partner Collabor-	
а	itions.	

7. Systems Studies

Long time series	Sediment infilling of the estuary/postglacial sea level rise – last 10000 years. Tides – 5 years. Fish discharged (tone) in local port – 30 years. Fluvial discharge of Guadiana – 50 years. Rainfall data -120 years
Research Projects	Monitoring and environmental management of Guadiana Estuary – development of a tool - MEGASIG (2004 -2006), EU-INTERREG IIIA program. Objective: create a versatile management and educational tools for the stakeholders. Multidisciplinary study of Guadiana River Estuary: Estuarine Dynamics – Present Situation, Anthropogenic Influences and the Perspective for the future – EMERGE. (1999 -2002). EU-INTERREG II program. Objective: define the principal environmental forcing factors acting upon estuarine system.
Socio-economic study	To be undertaken within the framework of recently approved Asia Link "Coastal-Profs" project.