



Miami-Florida Jean Monnet Center of Excellence European and Eurasian Studies Program

Water, Sustainability & Climate Change Miami, FL



Steven J. Green
School of International
& Public Affairs



Kingdom of the Netherlands



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Co-funded by the
Erasmus+ Programme
of the European Union

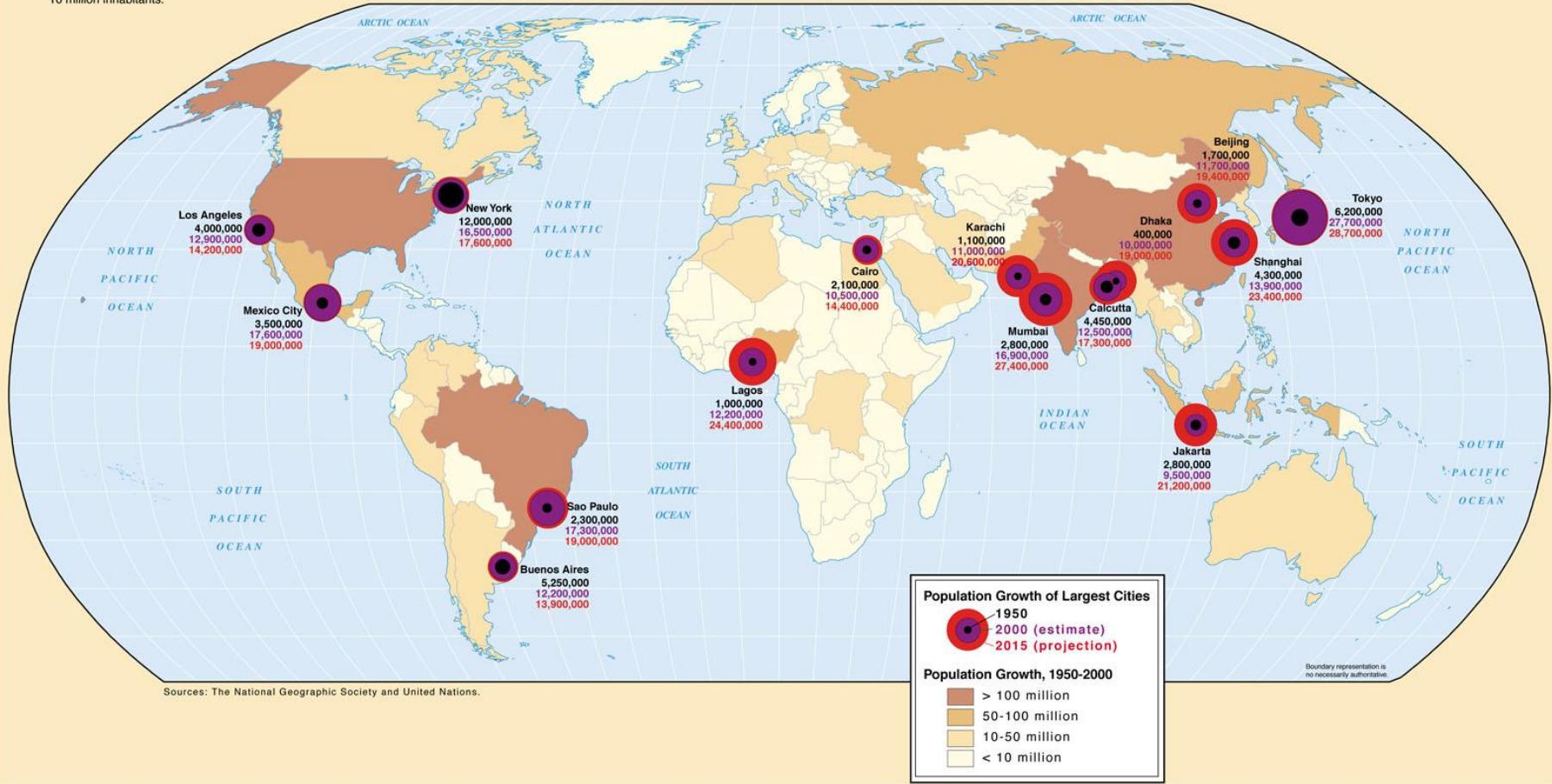


May 2, 2016
Fernando Nardi



Growth in Megacities^a

^aCities containing more than 10 million inhabitants.





Shanghai



Tokyo



World megacities

From the countryside... to cities

Urban world population

	1800	1900	1950	2010	2030 (?)
World	3%	14%	30%	50.5%	60%



Jakarta

<http://www.slideshare.net/maggiesalgado/megacities-13209966>



World megacities

Where are the world's largest cities?



The United Nations estimate that by 2015 the number of megacities will have increased to 21!



Megacities (city, million inhabitants)			
1950	1975	2000	2015
1. New York, 12.3	1. Tokyo, 19.8	1. Tokyo, 26.4	1. Tokyo, 26.4
	2. New York, 15.9	2. Mexico City, 18.1	2. Bombay, 26.1
	3. Shanghai, 11.4	3. Bombay, 18.1	3. Lagos, 23.2
	4. Mexico City, 11.2	4. Sao Paulo, 17.8	4. Dhaka 21.1
	5. Sao Paulo, 10.0	5. New York, 16.6	5. Sao Paulo, 20.4
		6. Lagos, 13.4	6. Karachi, 19.2
		7. Los Angeles, 13.1	7. Mexico City, 19.2
		8. Calcutta, 12.9	8. New York, 17.4
		9. Shanghai, 12.9	9. Jakarta, 17.3
		10. Buenos Aires, 12.6	10. Calcutta 17.3
		11. Dhaka, 12.3	11. Delhi, 16.8
		12. Karachi, 11.8	12. Metro manila, 14.8
		13. Delhi, 11.7	13. Shanghai, 14.6
		14. Jakarta, 11.0	14. Los Angeles, 14.1
		15. Osaka, 11.0	15. Buenos Aires, 14.1
		16. Metro manila, 10.9	16. Cairo, 13.8
	17. Beijing, 10.8	17. Istanbul, 12.5	
		18. Beijing, 12.3	
		19. Rio de Janeiro 11.9	
		20. Osaka 11.0	
		21. Tianjin 10.7	
		22. Hyderabad 10.5	

Describe the distribution of megacities in 2000.

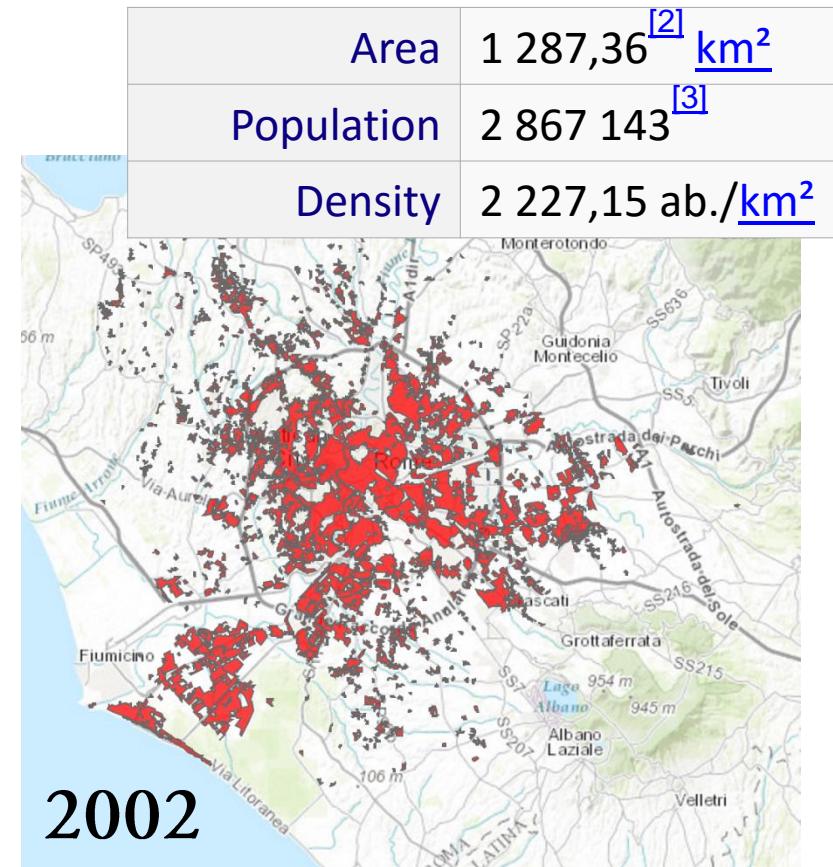
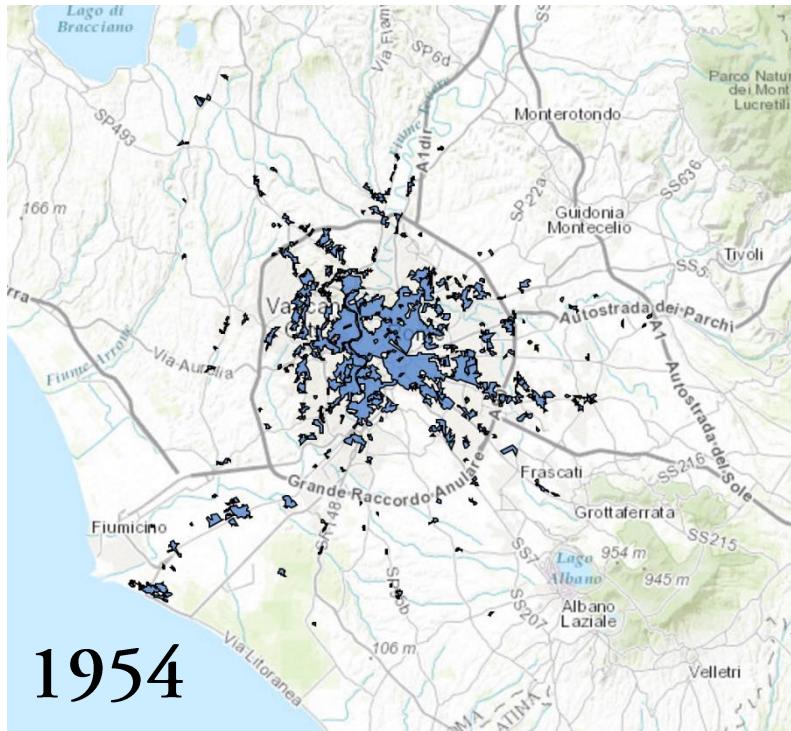
How does this compare to 2015?



2015: there are 35 megacities in existence



City of Rome

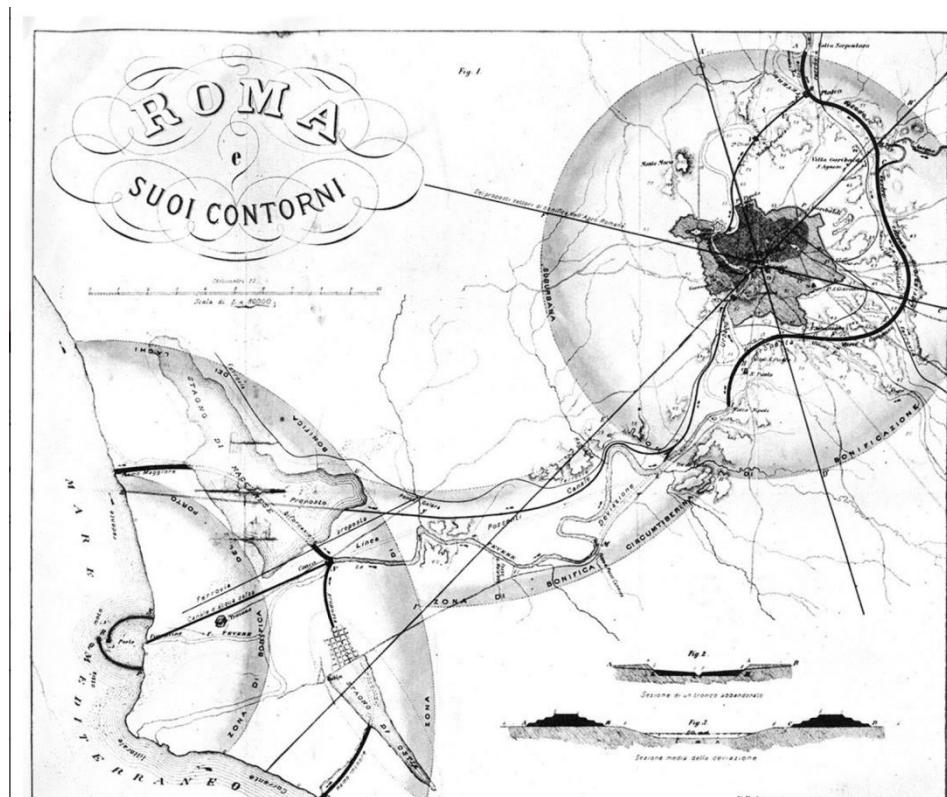


<http://www.arcgis.com/home/item.html?id=4e6b10329f804c1c8c04aaa4898c206e>

Developing the/towards the sea

1845

<http://www.codadellacometa.it/>

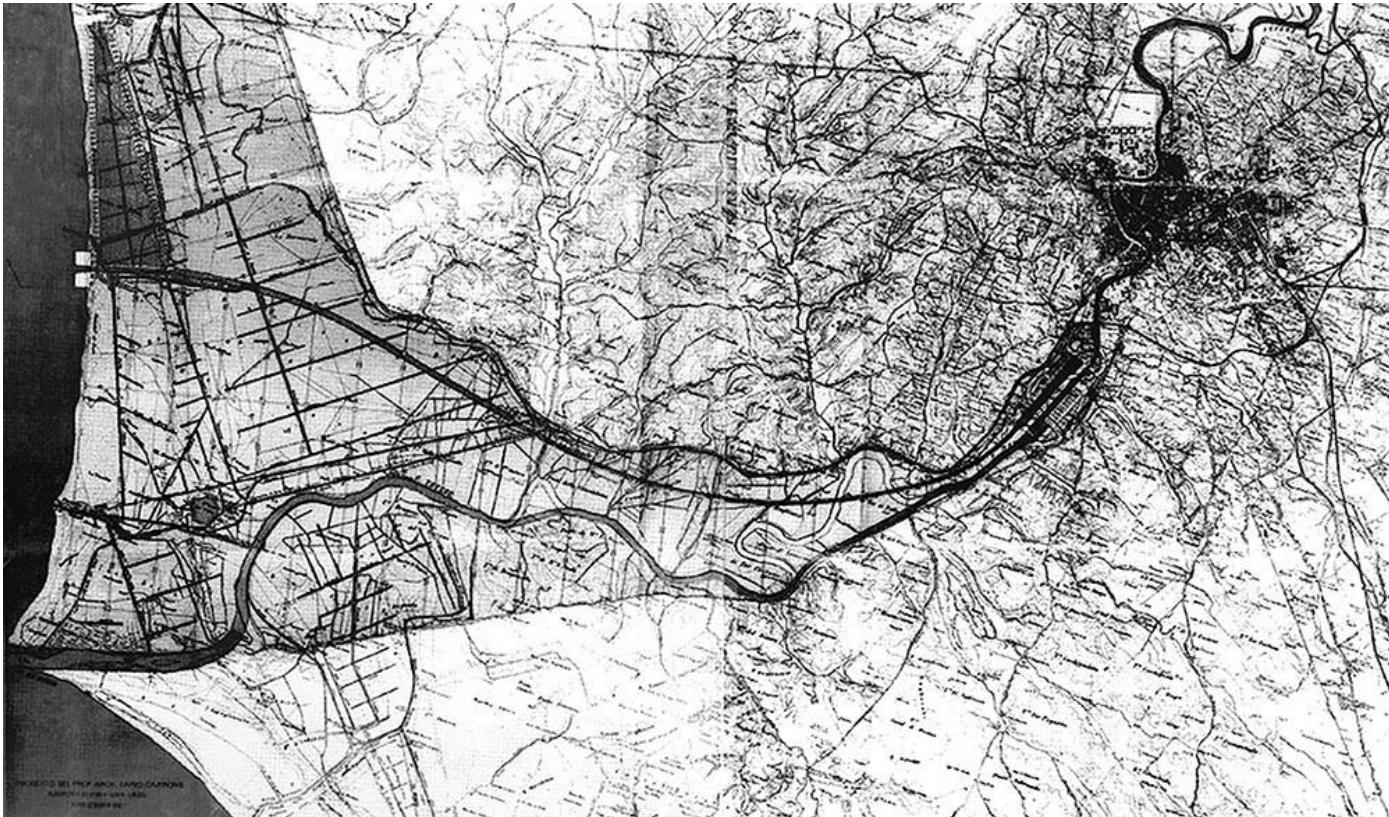


1875. Il progetto di Alfredo Baccarini sostenuto da G. Garibaldi
1 / 3 ◀ ▶ ▷

CLOSE X



Developing the/towards the sea



1912

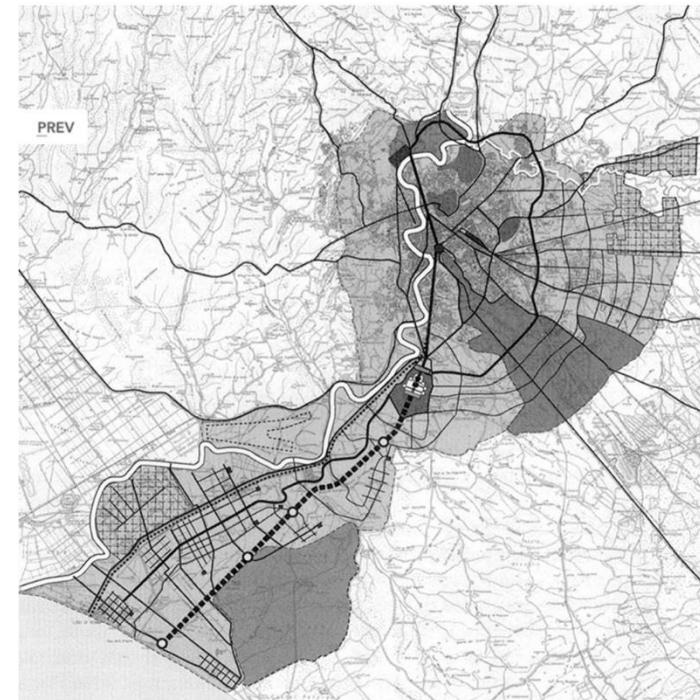
<http://www.codadellacometa.it/>



Developing the/towards the sea

1945

<http://www.codadellacometa.it/>



CLOSE X



Developing the/towards the sea

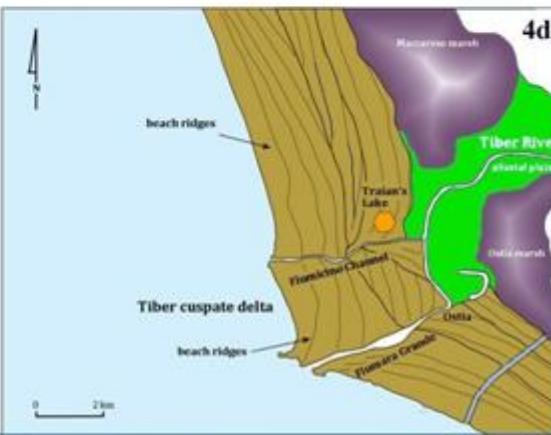
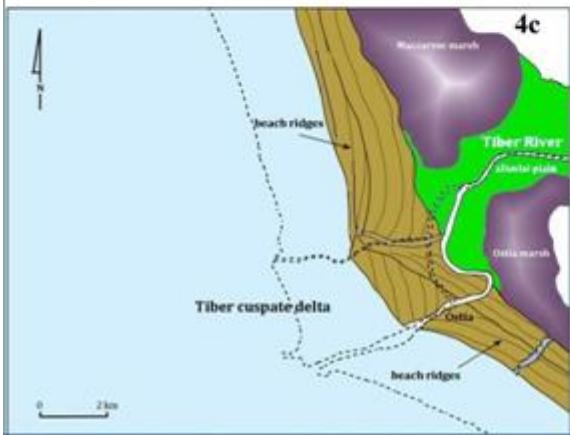
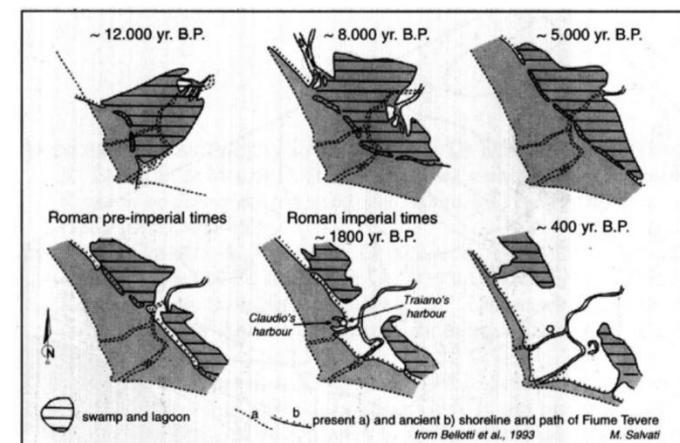
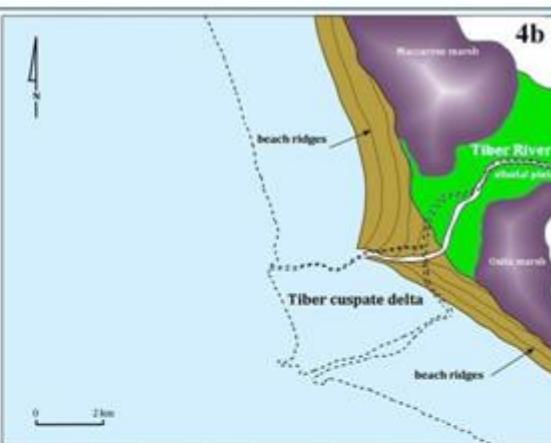
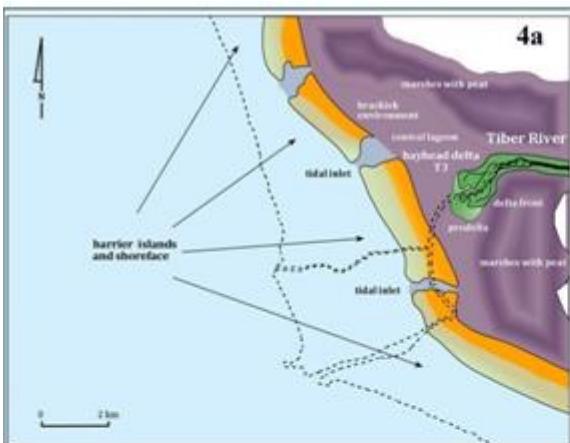


2002

<http://www.codadellacometa.it/>



The coastal sea/land interface



Evoluzione della Foce del Tevere a partire da circa 12.000 anni fa (da Bellotti et al., 1997). Il laghetto subcircolare mostrato nell'ultima immagine si è formato dopo l'alluvione del Settembre 1557.

Piero Bellotti, Sapienza Università di Roma

The coastal sea/land interface

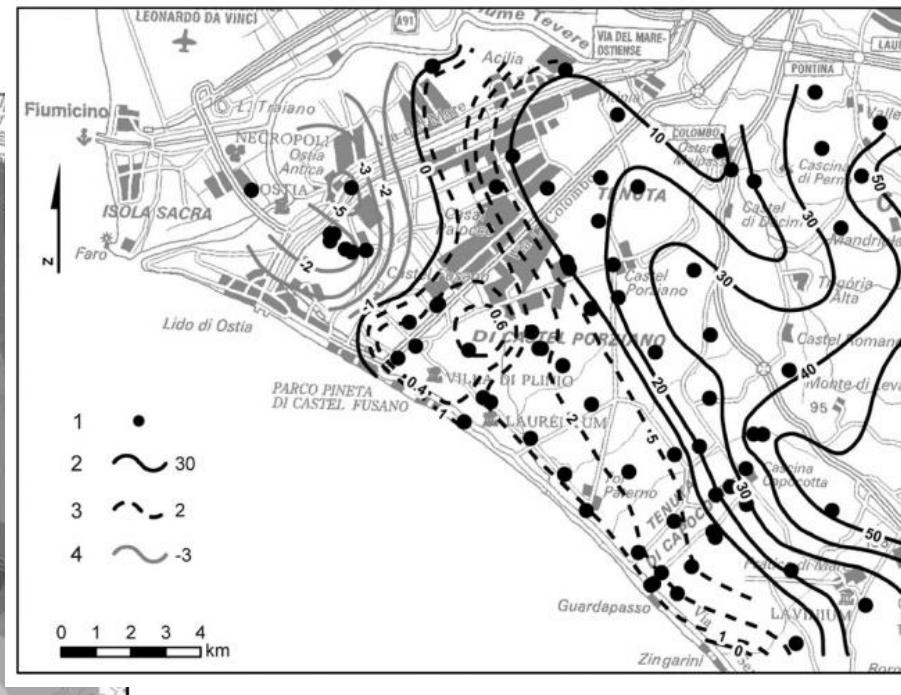
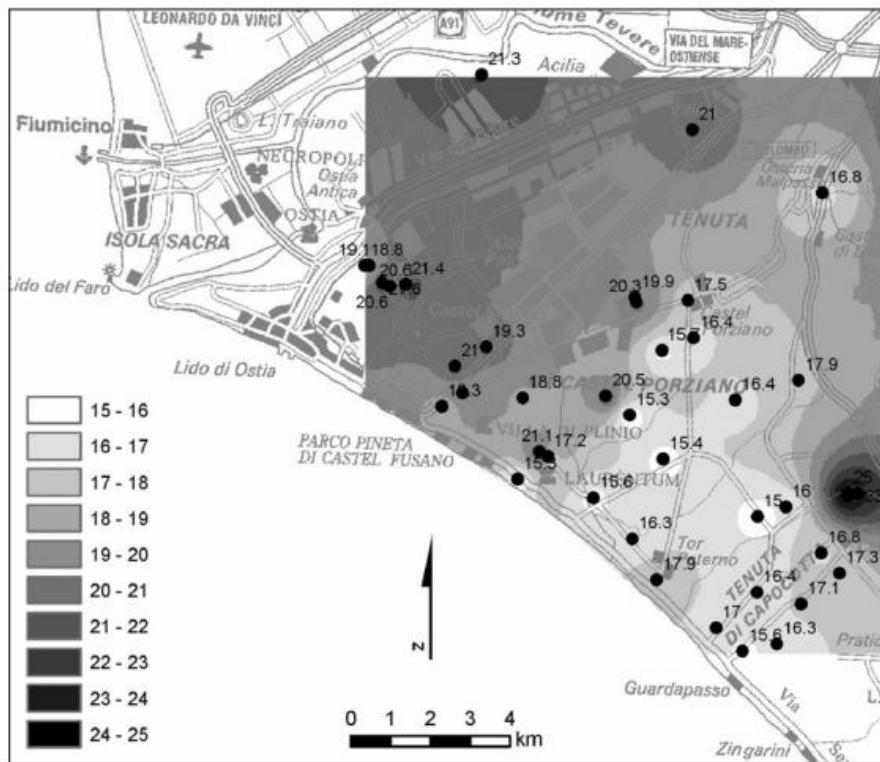


The coastal sea/land interface



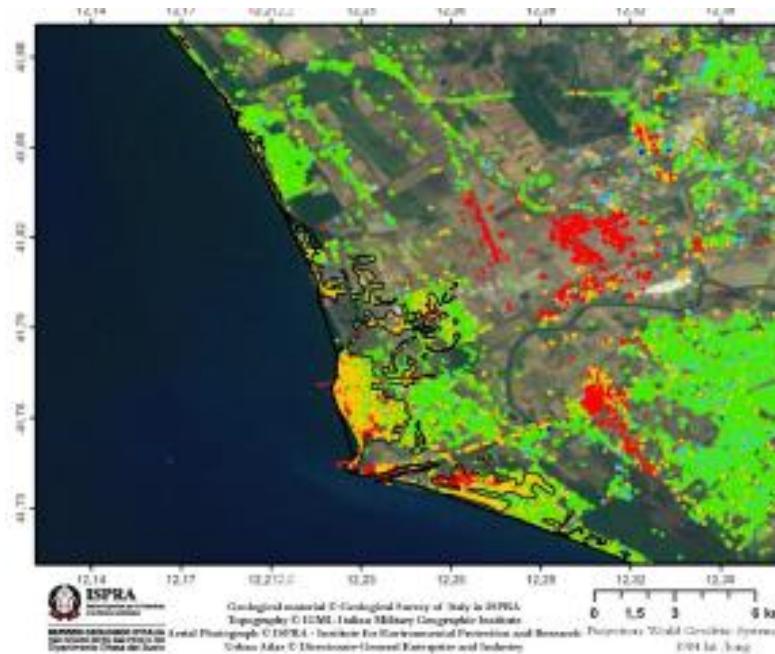
Pollution

Salt water intrusion



Capelli G., Mazza R., Papicchio C. / Giornale di Geologia Applicata 5 (2007) 13-28

Subsidence and sinkholes



Event_Area
PROM_Roma_007

PSE ERS Roma

Velocity

- 0.45 - -0.0
- 0.39 - -1
- 0.09 - 1
- 1.81 - 3
- 3.01 - 9.47



Geohazard information project [Pangeo](#) partner



Flood hazard



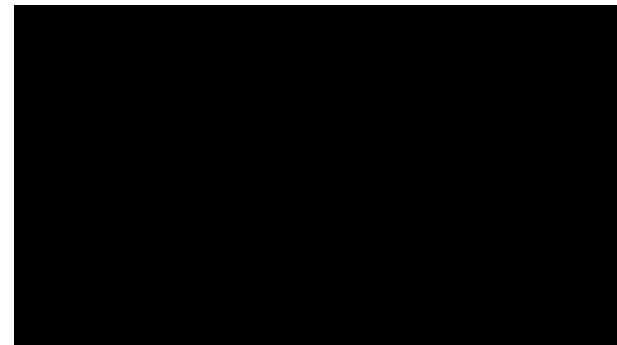
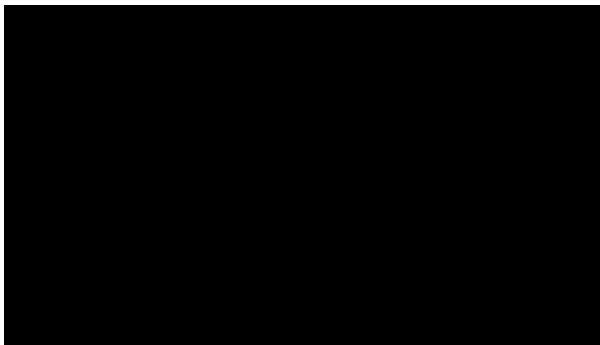
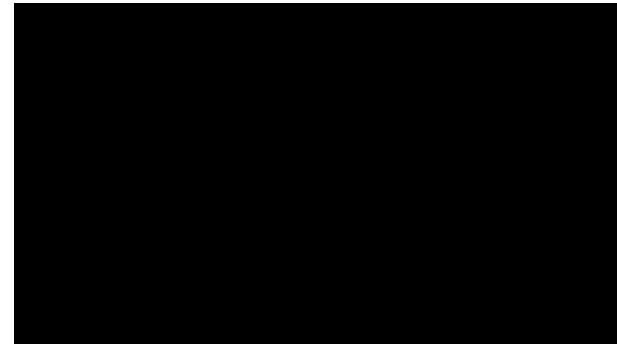
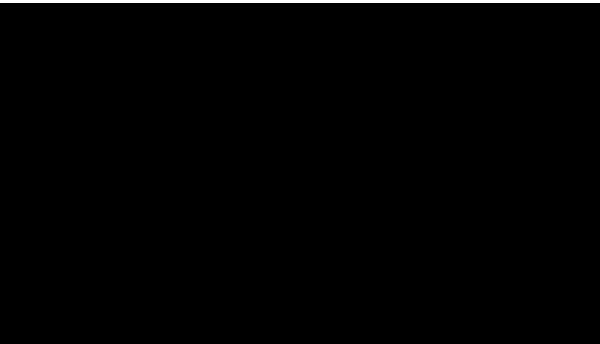


Flood hazard





Roma and floods

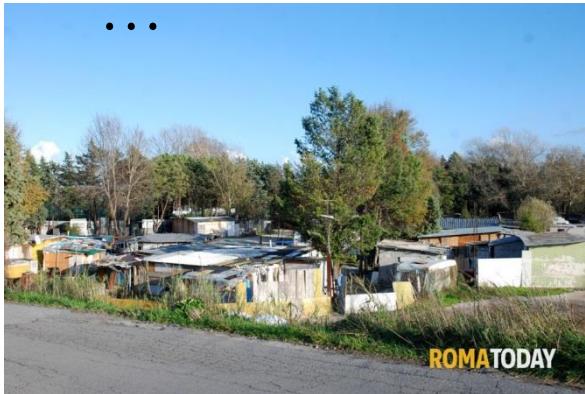




Fluvial and Costal zone hazard

- Water resource availability
- Water quality (Pollution)
- Subsidence
- Flood risk
- Storm surge (sea level rise)
- Drainage (channels and sewers)

...

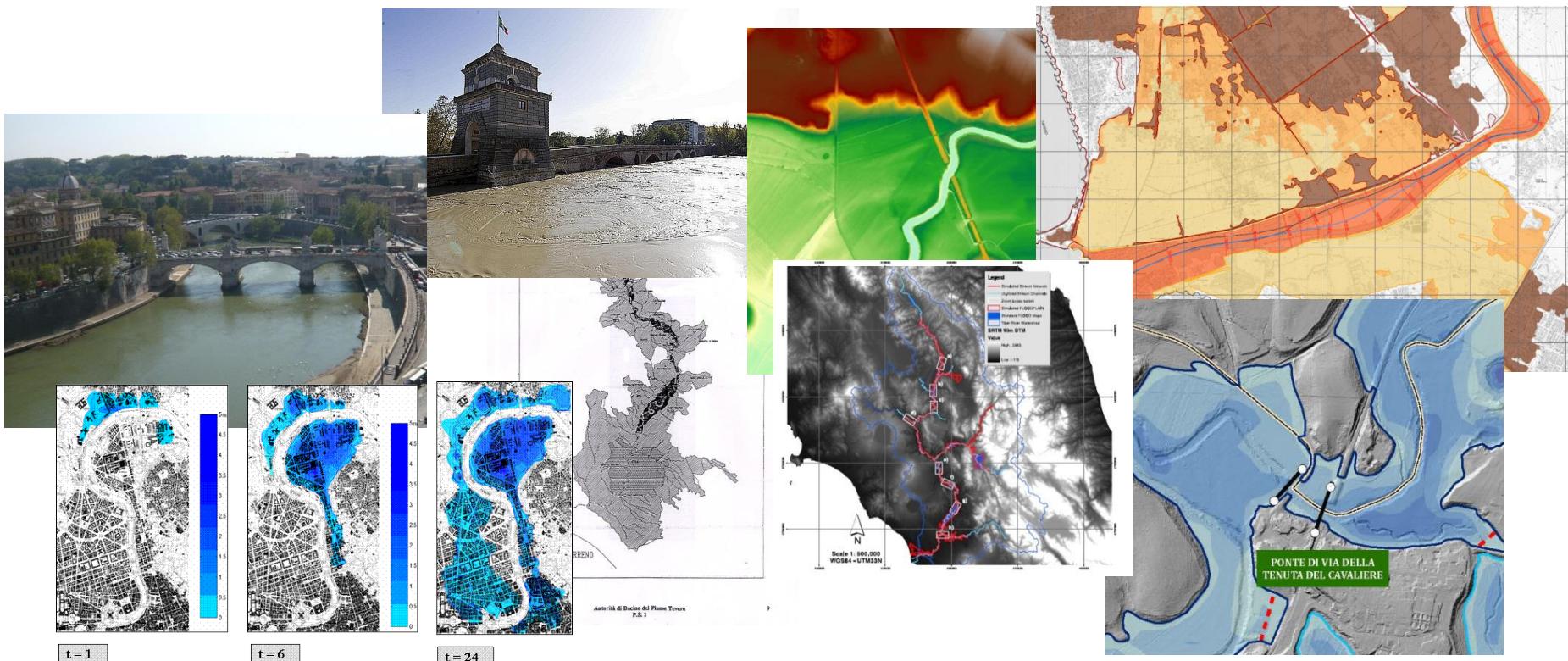


Archeology



Archeological sites and water/flood risk management

30+ years of Tiber river hydrologic and hydraulic studies

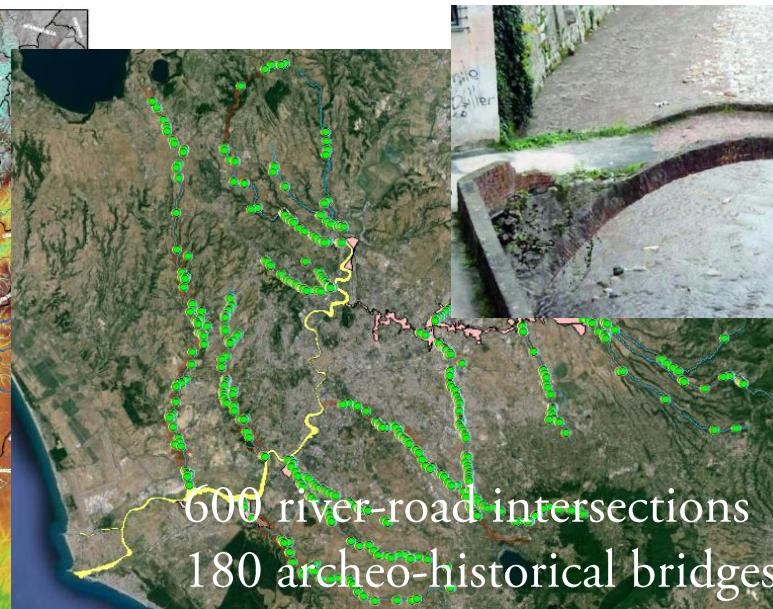
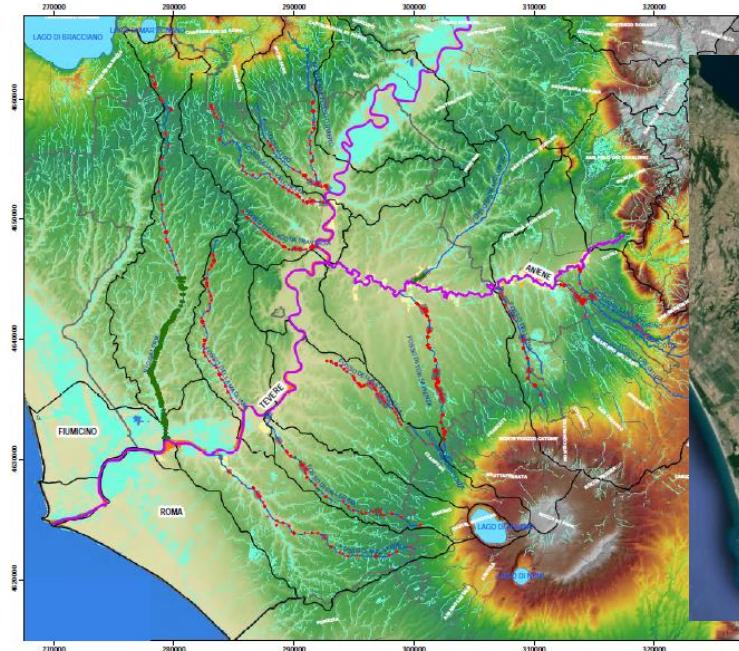




Archeological sites and water/flood risk management

2010-ongoing:

City of Rome Urban ecosystem flood hazard and risk mitigation plan

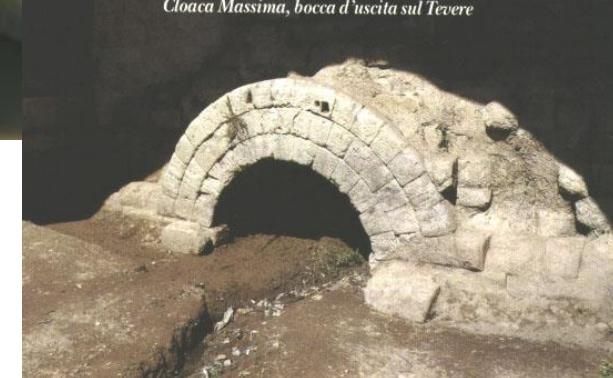




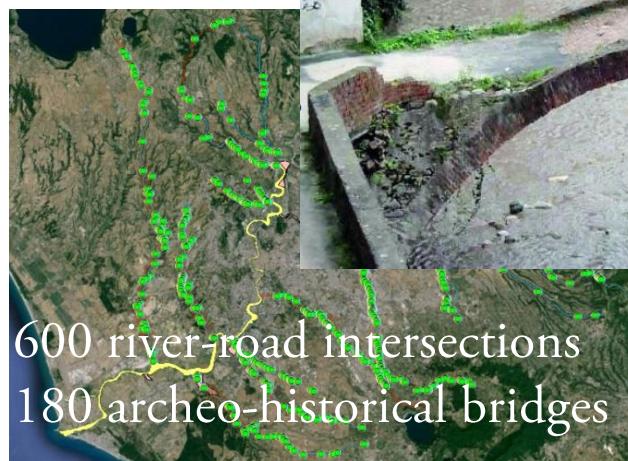
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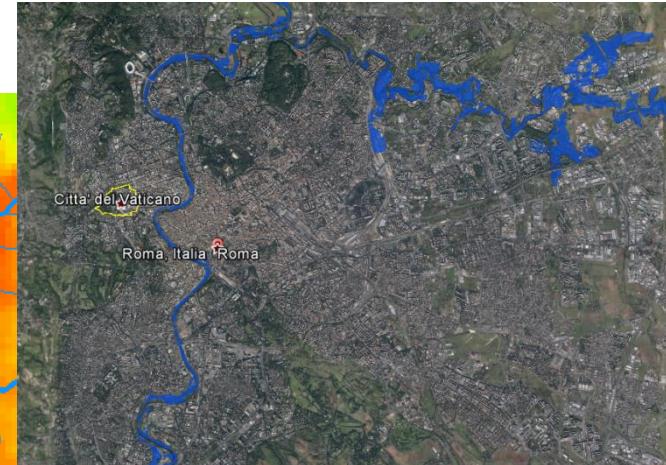
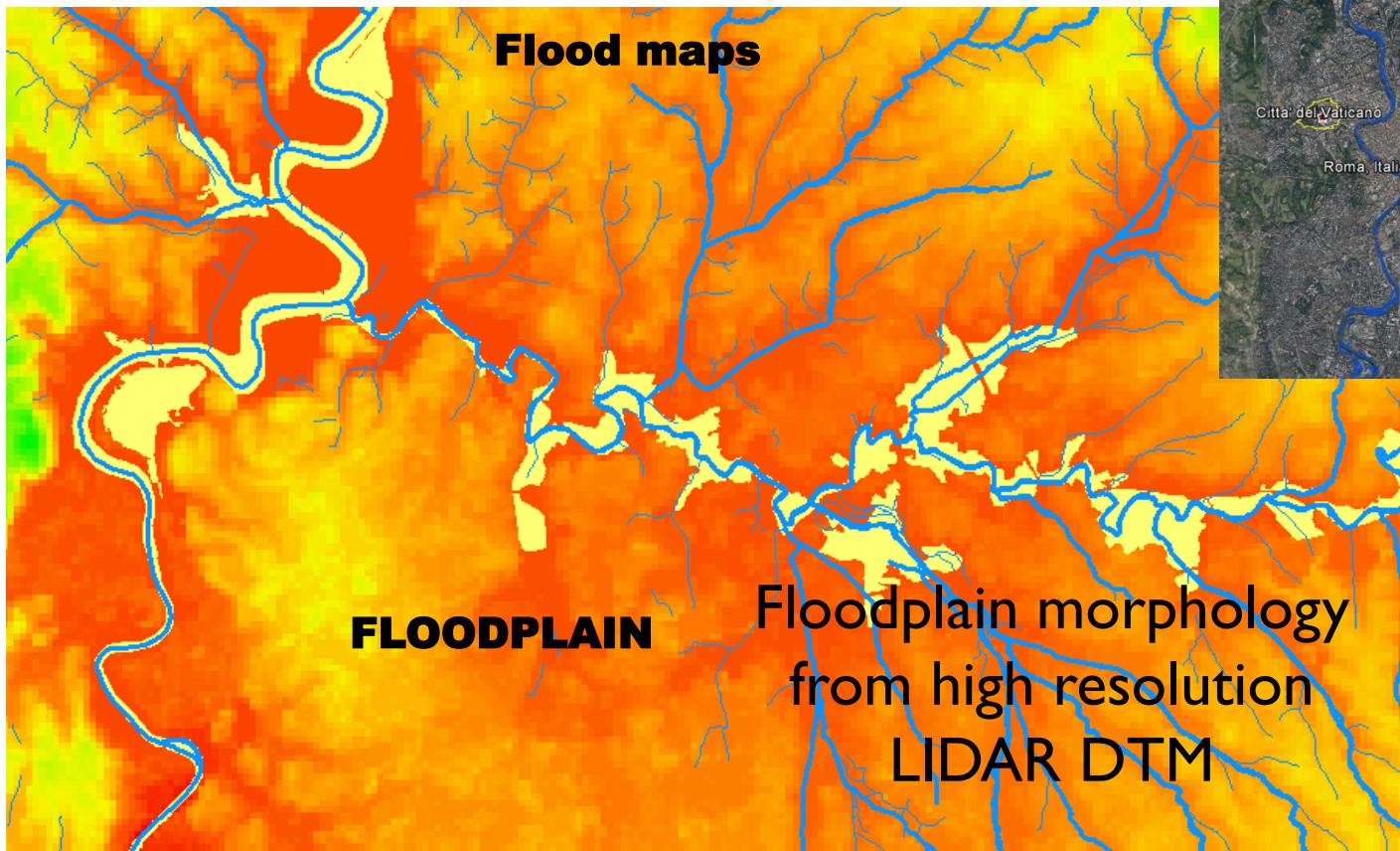


Cloaca Massima, bocca d'uscita sul Tevere





Rome geomorphologic floodplain map

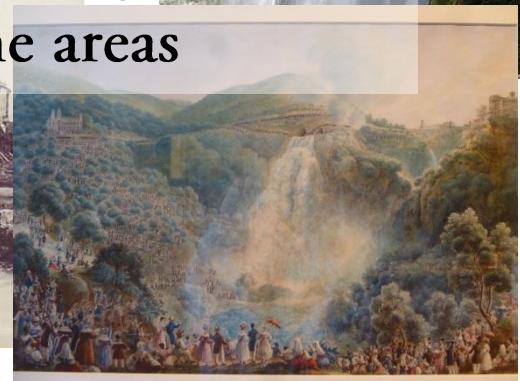
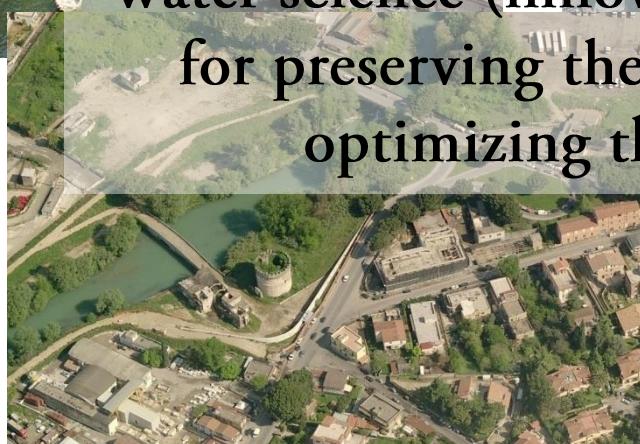
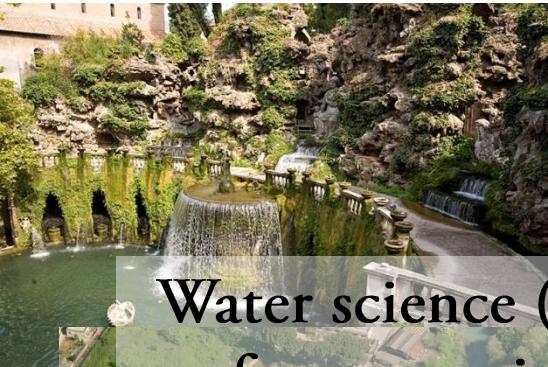




Water science for flood risk management

2013-ongoing

The UNESCO Tivoli/Villa Adriana site and the Aniene river flood mitigation



Water science (innovative technical and admin procedures)
for preserving the beauty of culture and history while
optimizing the resiliency of risk-prone areas



Rome Italy and Cultural Heritage at Risk



Human Heritage and Water in Italy

Natural Disasters (Floods)

Water resources management

Cultural, historical and monuments protection



Roma



Firenze



Venezia



Water is both a necessity and also a threat

Good water? And/or bad water?
The beauty and the Beast





Water is both a necessity and also a threat

Good water? And/or bad water?

The beauty and the Beast



Pompeii



Domus Aurea (Nerone)



Acid
rains





Human Heritage and Water in Italy

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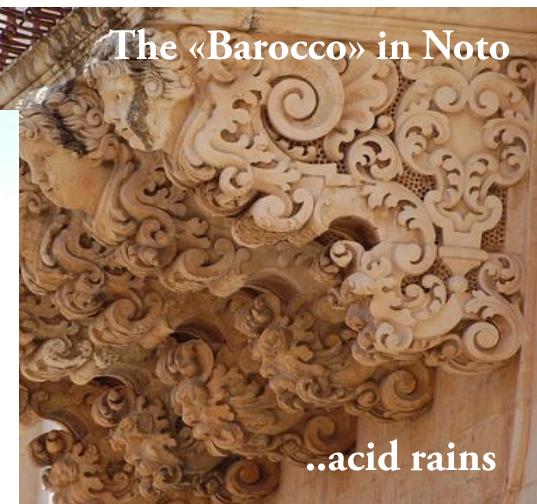
Structural failures



Pompeii



The «Barocco» in Noto



...acid rains

Archeological sites



Rome and Miami

Managing water for the present and the future



Rome and Miami Managing water for the present and the future Nature, history and water culture



+ 1 Foot



+ 3 Feet



+ 6 Feet

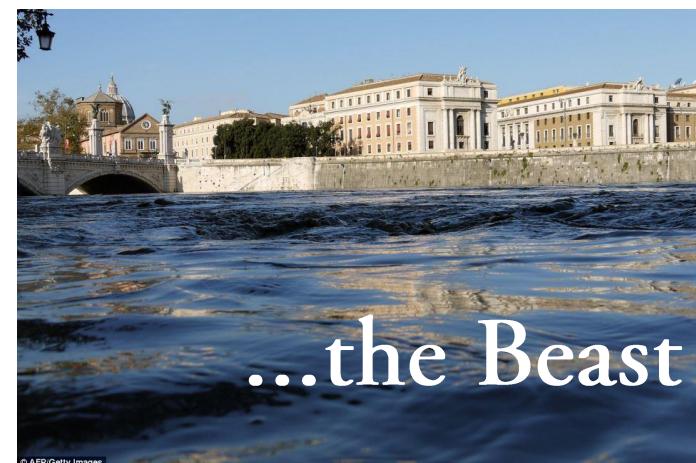
<http://slsc.fiu.edu/>



Rome and Miami Managing water for the present and the future

Nature, history and water culture

the Beauty and...



© AFP/Getty Images



Thanks for the attention



<http://www.unescowaterchair.org/>

<http://warredoc.unistrapg.it>

[http://www.wasup-lab.org /](http://www.wasup-lab.org/)

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