Documenting the global impacts of beach sand mining

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Beach sand: so common, so complex, so perfect for sand castles and now a precious and vanishing resource.

-Pilkey, Rice, and Neil
Overview

- History
- Where
- www.beachcare.org
- Why
- Impacts
- Case Study
  - Jamaica
  - Morocco

Morocco 2006. Photo: Lana Wong
History

• Construction
  – Vitruvius’ writings
  – Pit sand, river sand, beach sand

• Precious mineral mining
  – metals
  – Atomic energy
Where in the world?
Where in the world?
www.beachcare.org
sand mining database
Negative impacts of beach sand mining

• Habitat loss
• Reduced species richness
• Increased shoreline erosion rates
• Threats to critical infrastructure
• Decreased protection from ocean disasters
• Threats to human life
• See Defeo et al. 2009: Threats to sandy beach ecosystems: A review
Positive impacts of beach sand mining

• Jobs
Case study: Jamaica

- 17 JUL 2008: Five hundred truckloads of sand stolen from Coral Springs beach
- Length ~ 400 m linear beach removed
- Effective at stopping a $1 Billion hotel development

Articles from Jamaican web news sources: 17 JUL – OCT 2008
- Latest Jamaica Beach Theft a Blip on Map of Similar Heists - Sparks Traveler Concern
- 500 truckloads of sand stolen!
- Millionaire thieves - Samuda decries sand theft in Coral Springs
- Missing sand found
- Jamaica puzzled by theft of beach
- Hotels 'may be behind' Jamaica sand theft
- Jamaican police nowhere nearer to solving 'stolen beach' case
- (Grenada) Government takes steps to protect beaches against sand mining
- Seven accused of illegal sand mining (FEB 2009)
Case study: Morocco

- Massive construction projects: King Mohammed IV in 2003
- 7 day trip in June, 2007 with coastal geologists Robert S. Young, Orrin Pilkey, and Joseph Kelley
- Visited sites in northern Morocco near major cities Larache and Tangier
- Systematic removal of beach from north to south of entire country
The beach at Hawara June, 2007; completely stripped of sand between 2003 and 2006.
Morocco 2007

Results of beach sand mining
Morocco 2007

Near Kenitra

Back dune mining
Conclusions

• Beach sand mining degrades coasts, destroys tourism potential, and endangers human life
• Exacerbates problems of sea level rise
• Alternatives should be used to mitigate environmental impacts
• Alternatives can employ large numbers of people
Recommendations

• UNESCO: action to address the issue of beach sand mining at the global scale, find alternatives to beach sand mining

• Coastal geomorphologists: communicate with us to expand sand mining database, populate with real volume data and impacts
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