Environmental Aspects of Dredging in Ports

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What is CEDA?

• an independent, non-governmental, non-profit professional association for the dredging community

• interest includes all aspects of dredging

• members are drawn from many different fields (individual and corporate)
What is CEDA?

• is a vital network for the exchange of knowledge and experiences in dredging
• is a centre for communication and training about environmental aspects of dredging
• is a platform for promotion of dredging as a tool for sustainable development
Activities

• Workshops/seminars/webinars
• Task groups
• Participating in LC, OSPAR, Danube Commission
• WFD Navigation Task Group
• Marine Strategy FWD
• Positioning papers
• Own guides
• Other guides
• Environmental Day on WODCON
Need for Dredging

• Capital works
• Maintenance
• Land reclamation
• Flood management
• Clean up
Environmental Impacts

• (Short-term) effects of the dredging activity:
  – suspended sediment leading to turbidity;
  – overflow from hoppers;
  – loss of dredged material during transport (hopper, pipeline);
  – loss of benthic fauna at dredging or placement site:
    - sound

• Decision-making on dredging needs a site specific assessment to determine if there are unacceptable effects and if they can be sufficiently mitigated or compensated
Mitigation of Potential Environmental Impacts

• Improve accuracy
  – dredging thin layers and reduce dredging volume
  – improved onboard automation and monitoring

• Reduce turbidity

• Reduce spill, loss

• Minimise dilution, increasing density
Examples of mitigation measures

• Measures on board the dredger
  – Special designed cutter heads, degassing systems, monitoring
  – Careful navigation in shallow water
  – Limit overflow
  – Avoid spillage from open barges/hoppers

• Measures at the dredging site
  – Silt screens
  – Complete enclosure of the dredging equipment

• Measures at the placement site
  – Underwater diffuser
  – Seasonal restrictions/tidal restrictions
  – Confined Disposal Facility
Management options for destination of dredged material

• Relocation in the aquatic system preferred option to maintain sediment balance
• Use directly or after treatment
• Un/semi confined aquatic placement
• Confined disposal facility
Sustainable Management of Dredging

- Cleaning up contaminants
- Minimising transport (energy, air pollution)
- Using dredged materials
- Closed balance of material
- Do nothing!
- Sensible decisions (emotion)
- Use available knowledge
WODA PRINCIPLES OF SUSTAINABLE DREDGING

1. Social, environmental, and economic objectives should be systematically considered and integrated
2. Work with natural processes and the site-specific characteristics of ecosystems
3. Stakeholders should be engaged at the earliest conceptual stage
4. Use scientifically based criteria and guidelines
5. Beneficial use of dredged materials should be given priority
6. Dredging can be a key solution for remediation and restoration
7. Monitoring and assessment information before, during and after project
The experience of CEDA

- Most of dredged sediments are not contaminated.
- Dredging is part of the solutions and a dredging decision has to be taken based on a management plan.
- Source control is the first option for a real solution of a problem where contaminated sediments are involved.
- Placing dredged material back into the estuarine or coastal system can be the best solution to safeguard the ecological conditions.
The experience of CEDA

• Treatment of dredged material can be considered as a last resort. Not as a standard solution. First beneficial use, than storage and finally treatment

• The only operational treatment techniques are separation and dewatering. Treatments for decontamination is in general no option because not feasible.
The experience of CEDA

• In long term management plans beneficial use is the only long term sustainable option. Any storage volume is finite and often siltation is an ongoing process with continuously growing quantities. Even in case of disposal one should take care for the beneficial use of the site after completion of the disposal operations.
Encountering dilemma’s

• How do we make decisions in a balanced way?
• How do we handle if we do not have all the knowledge (precautionary principle)
• What is more important nature or safety?

CEDA has a role:
• Providing expertise
• Case studies
• Start discussions
• Position papers
Publications

- Underwater sound with regard to dredging
- Climate change adaptation as it affects the dredging community
- Environmental Control on Dredging Projects
- Dredged Material as a resource
- Moving sediments in a Natural system
- Adaptive Management of Dredging Projects
- Ecosystem services
- New Guideline: more pro active

Underwater Sound
In Relation To Dredging

The Central Dredging Association is committed to environmentally responsible management of dredging activities and this paper – produced by the CEDA Environment Commission – sets out in detail some of the causes and consequences of underwater sound associated with dredging.

Dredging is an activity that is carried out for many purposes. The dredging process can be significantly described in the excavation of sediment from a sea, river or lakebed and the handling and transport of the excavated sediments and/or reclamation site materials. Dredging activities affect the following:

- Environmental and biodiversity impacts on river, estuaries, and wetlands
- Degradation of water quality and nutrient enrichment
- Habitat destruction and loss of species
- Sedimentation and coastal erosion

Underwater sound is generated by a variety of activities, including:

- Ship engines
- Propellers
- Sonars
- Underwater construction activities

The effects of underwater sound can be studied through various methods, such as physical models, numerical simulations, and field studies. These studies can help to address the following:

- Understanding the impact of underwater sound on marine life
- Developing strategies to mitigate the effects of underwater sound
- Assessing the effectiveness of mitigation measures

This paper aims to provide a comprehensive understanding of underwater sound associated with dredging activities and to discuss the measures that can be taken to minimize its effects on marine environments.
Conclusion and recommendations

• More pro active than re active approach
• There is a lot of knowledge available so use it and do not try to find out the wheel again
• There are organizations who can help in finding the right knowledge
• Also more knowledge exchange is essential
• There are still uncertainties so research and discussion is needed
• There are no blue prints
• More cooperation is needed