Potential Solutions to Arctic Coastal Erosion

Adapted by Marilyn Sigman, Alaska Sea Grant, from a presentation by John E. Zufelt and Orson P. Smith: "Arctic and Low-Cost Erosion Control" PowerPoint slides, 4/10/16

Full presentation (.pdf):
http://arcticdomainawarenesscenter.org/css/images/pdf/online_course/presentation/Arctic%20and%20low-cost%20erosion%20control.pdf

Berms

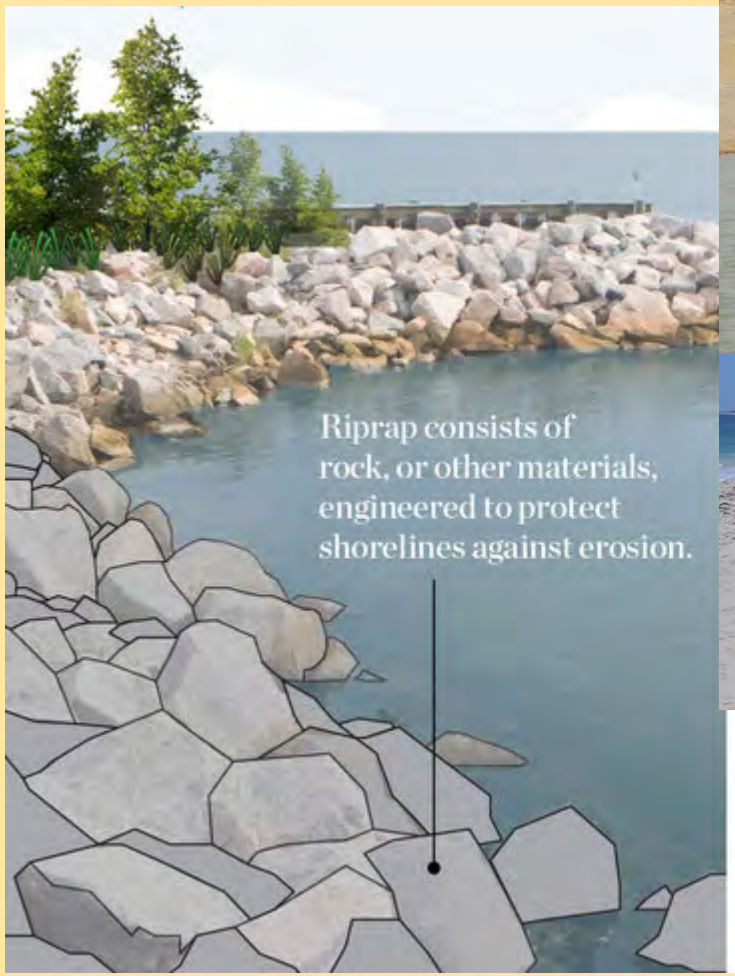
Photo Credit: Yereth Rosen

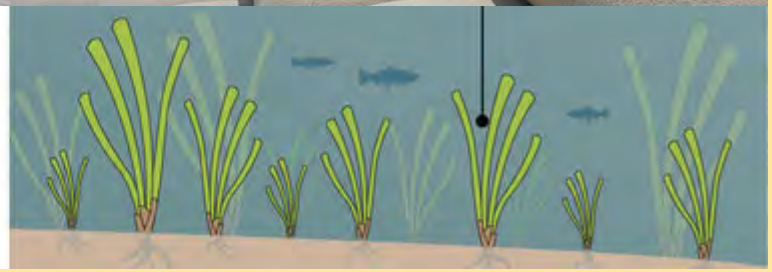
An earthen berm provides partial protection to Stevenson Street, a crucial road linking parts of Utqiagvik that is threatened by flooding and erosion during fall storms.

Potential Solution:
Build a berm to absorb the force of the waves and block in-coming torm surge flooding.

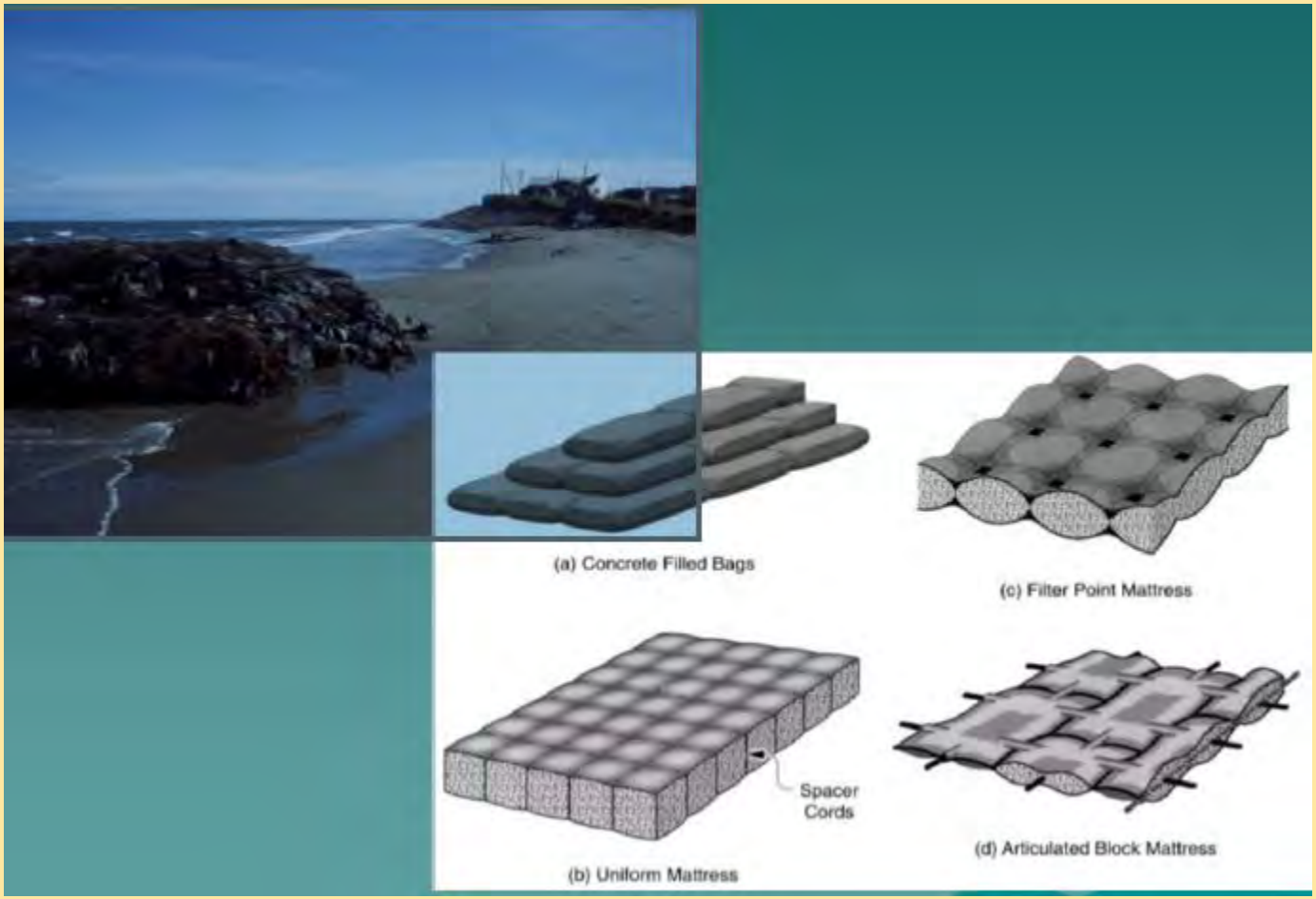
Sand Bags

Engineered Structures





Riprap, Sand Bags, Gabions, Plantings



Concrete-Filled Fabric

Wooden Bulkheads and Groins

FENCES

Metal Sheet Piling Fence

Low-Cost Alaska Methods

Rocks and Timber Fences

Conclusion of Coastal Engineers

- None of the low-cost techniques work too well
- Possibly work on the deficiencies of these or develop new methods
  - Avoid vertical walls where wave reflection will induce toe material loss
  - Ensure elements are suitably tied together
  - Don't forget the filter layer
  - Maximize the benefits of wave protection and ice resistance
- Low-cost may be suitable for only short term

- John E. Zufelt and Orson P. Smith, 4/10/16