# North Shoreline Restoration

# North Shoreline – Beach Construction

# North Shoreline – Completed Beach

# North Shoreline – Completed Beach

# North Shoreline – Pre-project

# North Shoreline – Path and Beach Construction

# North Shoreline – Beach Nourishment at Remaining Wall

# North Shoreline – Completed Beach Prior to Revegetation

# North Shoreline – Riparian Re-vegetation

# North Shoreline – Pre-project Play Area and Lawn

# North Shoreline – Relocated Play Area and Lawn

# North Shoreline – Relocated Lawn and New Picnic Area

# North Shoreline – Rock Groins Pre-project

# North Shoreline Restored Beach

# Monitoring: Phase 1 – South Shoreline

**Before: 2004**

**After: 2006**

**Benthic Invertebrates:** Three different tidal elevations

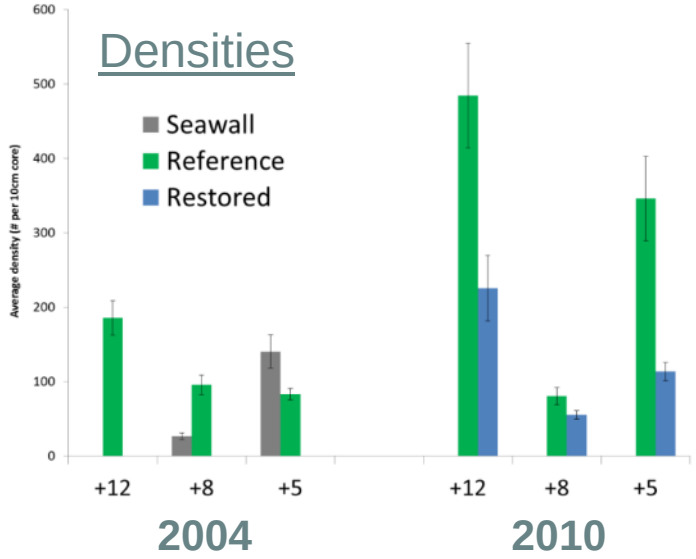
1. +12: Wrack line
2. +8: Base of modifications
3. +5: Low elevation of beach regrade

**Physical Monitoring (by CGS):**
Substrate size, beach profiles, and overall sediment movement

# Phase 1: Benthic Macro-invertebrates at Different Tidal Elevations

**Densities:** Improvement at Restored site in 2010 where modifications were removed (+12 and +8), but densities still greater at Reference site, at +12 and +5.

**Taxa Richness:** Improvement at Restored site in 2010 at all elevations, greater than Reference at +12 and +5, less at +8.

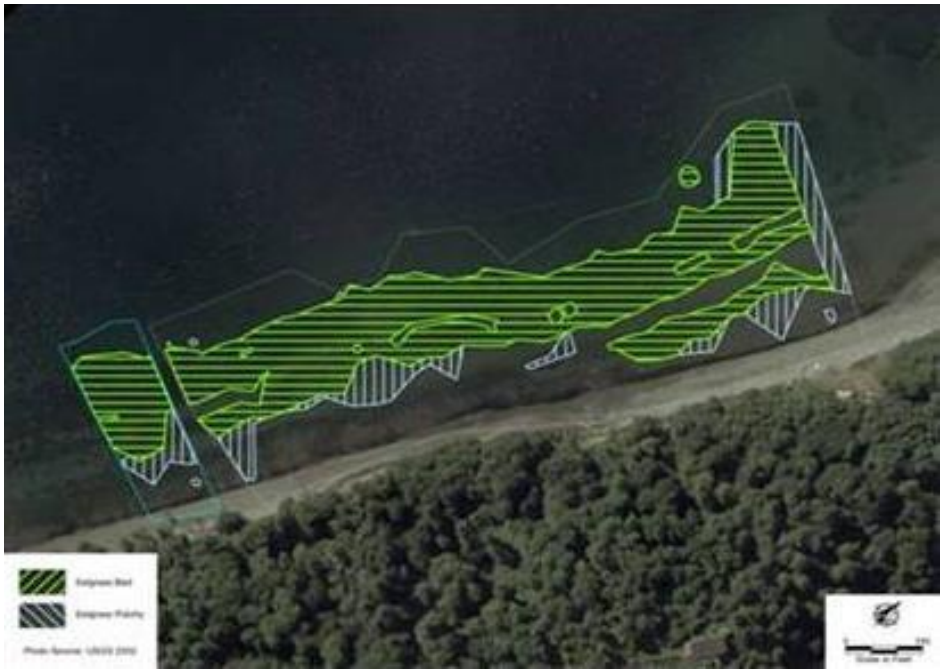



# Phase 1: Physical Beach Sediment Monitoring

- Monitoring began prior to beach restoration and occurs at two seasons a year (since 2004)
- Overall beach is relatively stable, with localized increases and decreases in sediment
- Most significant loss of material is lowering of upper beach backshore at south end of project
- Significant proportion of beach is now suitable sediment size for forage fish (sand lance and surf smelt) spawning – a primary goal of the beach restoration

# Phase 1: Other Biological Monitoring

Forage Fish Monitoring



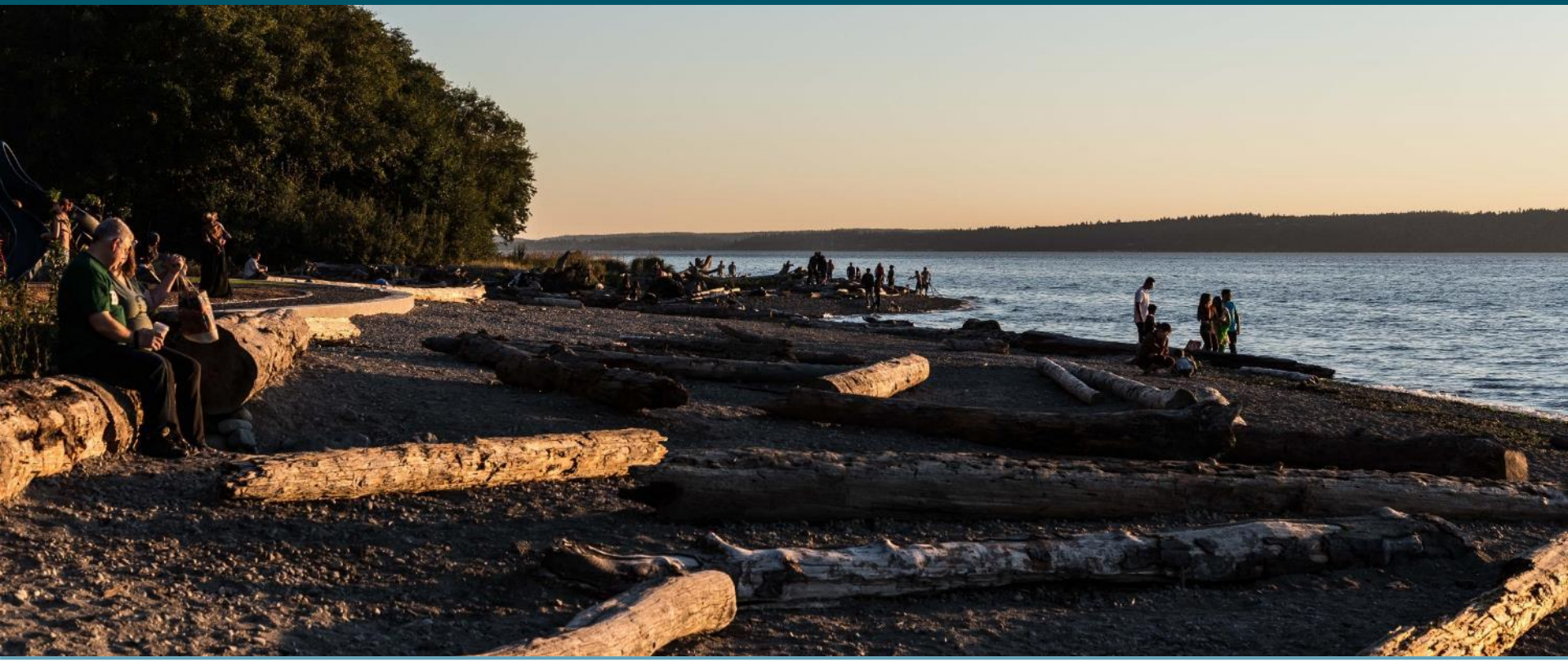
Eelgrass Monitoring

# Phase 2: North Shoreline Monitoring

- Pre-Construction:
  - Eelgrass
  - Physical Beach Sediment
  - Forage Fish
- Post-construction: (To Be Completed)

# 4. Summary and Conclusions

- Is It Working?
- Upcoming Presentations and Site Walks

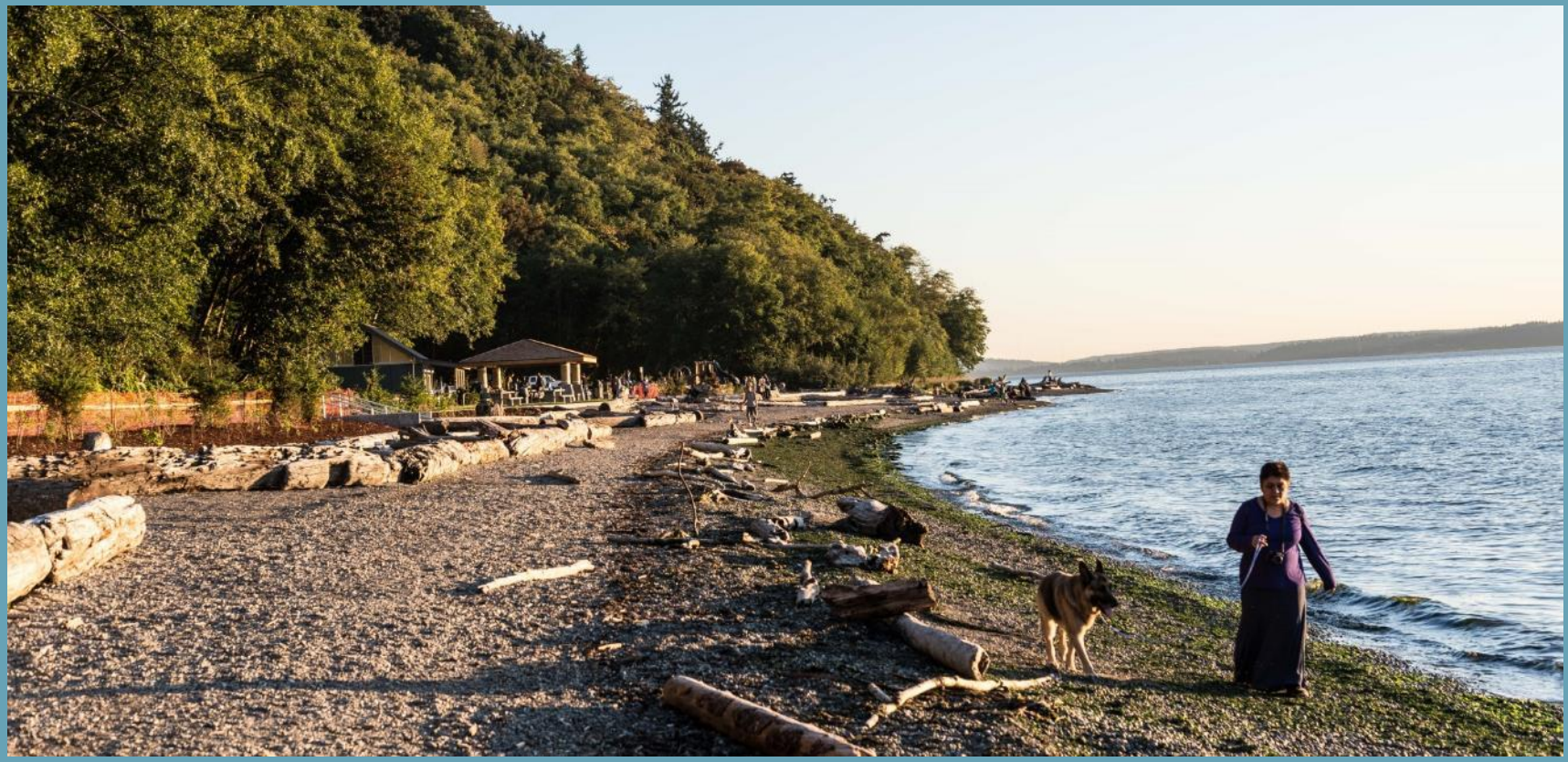


# Is It Working?
# Coastal and Bluff Geology

# Is It Working?
# Nearshore Habitat Diversity and Connectivity

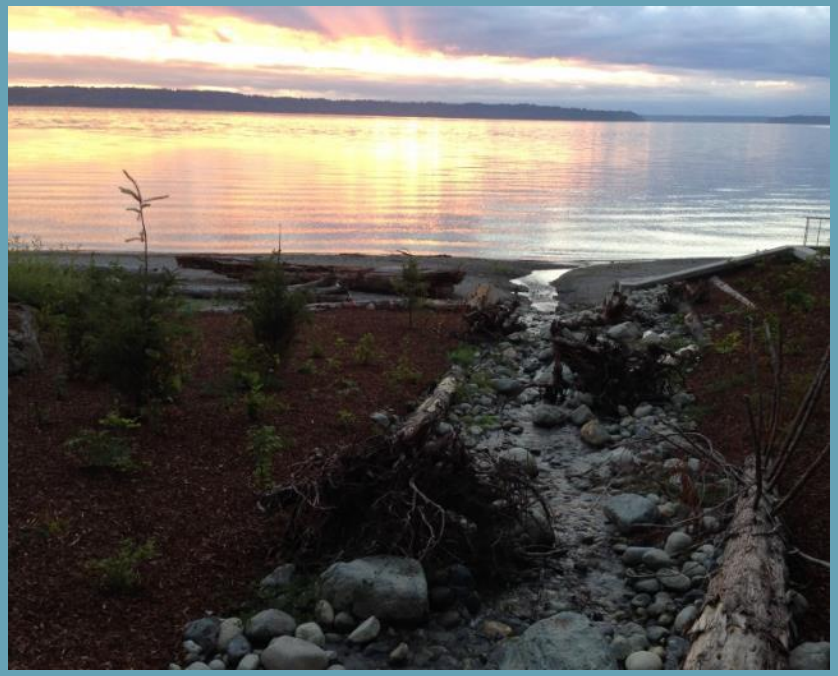
# Is It Working?
# Key Community Concerns

# Is It Working?
# Integrating Habitat and Recreation



# Is It Working?
# Increased Environmental Education Opportunities

# Is It Working?
# Utility Relocations, Green Stormwater Infrastructure



# We Did It!

# Upcoming Presentations and Site Walks

- **Coastal Geology Guided Tour**
  Sunday, Sept. 21, 10:00 am
  by Jim Johannessen
- **Nearshore/Fish Habitat Lecture**
  Tuesday, Sept. 23, 6:30 pm
  by Paul Schlenger
- **Nearshore/Riparian and Wetland Habitat Lecture**
  Tuesday, Sept. 30, 6:30 pm
  by John Small
- **Hillside Geology Guided Tour**
  Saturday, Oct. 4, 10:00 am
  by Bill Laprade

# Thank You!

## Contact Information:

**Peter Hummel**
**phummel@anchorqea.com**
**(206) 287-9130**

# Phase 2 Project