



# **Coastal Housing**

**Problems. Solutions.**



The Allure of the Ocean



The Allure of the Ocean

- **COASTAL POPULATION**  
(within 120miles or <10meters above sea level)



- **39% Of US (123,000,000)**
- **40+% Of World's (3,200,000,000)**



**2004 Tsunami Kills 250,000**



Japan tsunami - 2011



Mother Nature Intervenes



Mother Nature Intervenes





Mother Nature Intervenes

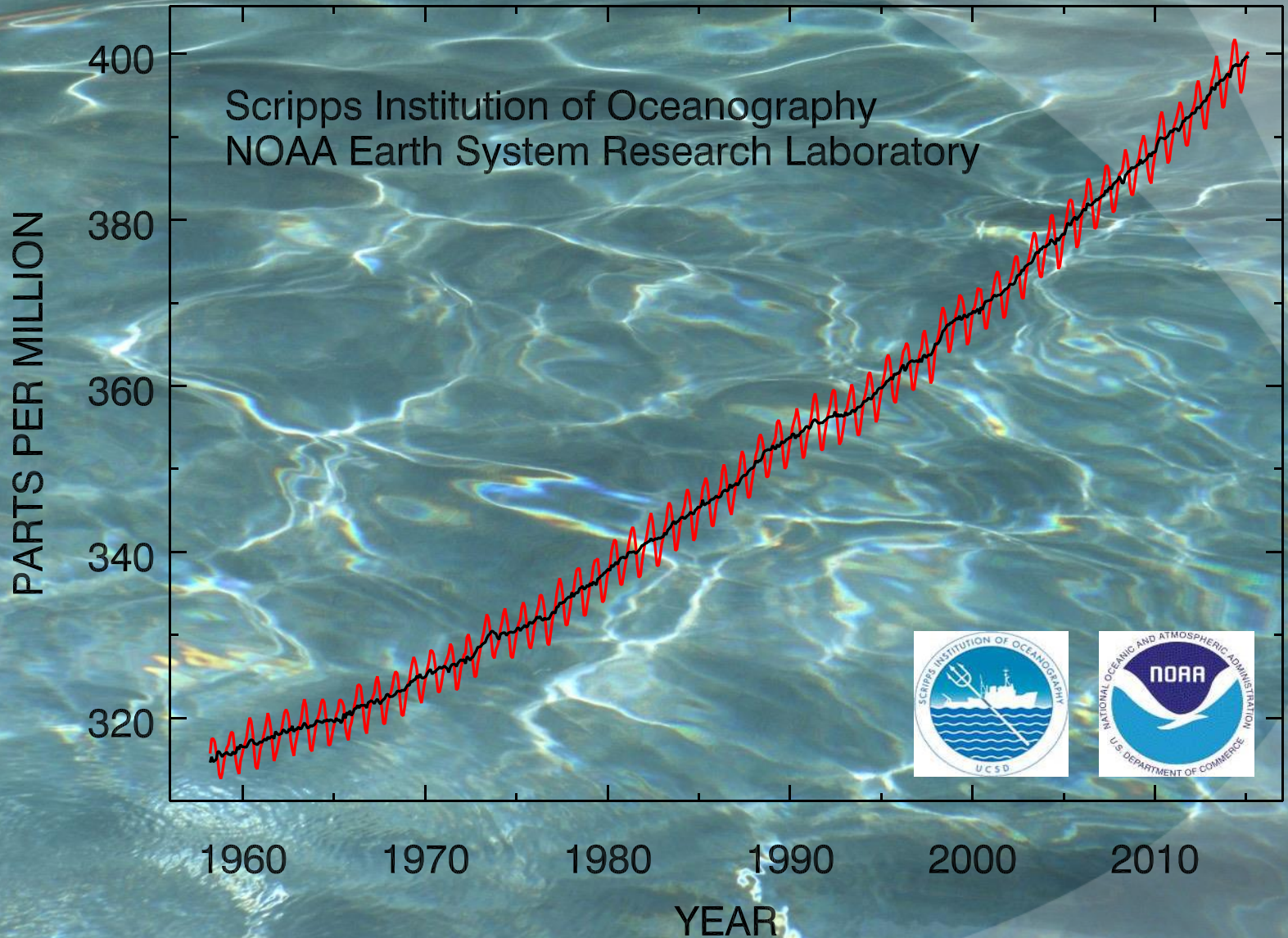


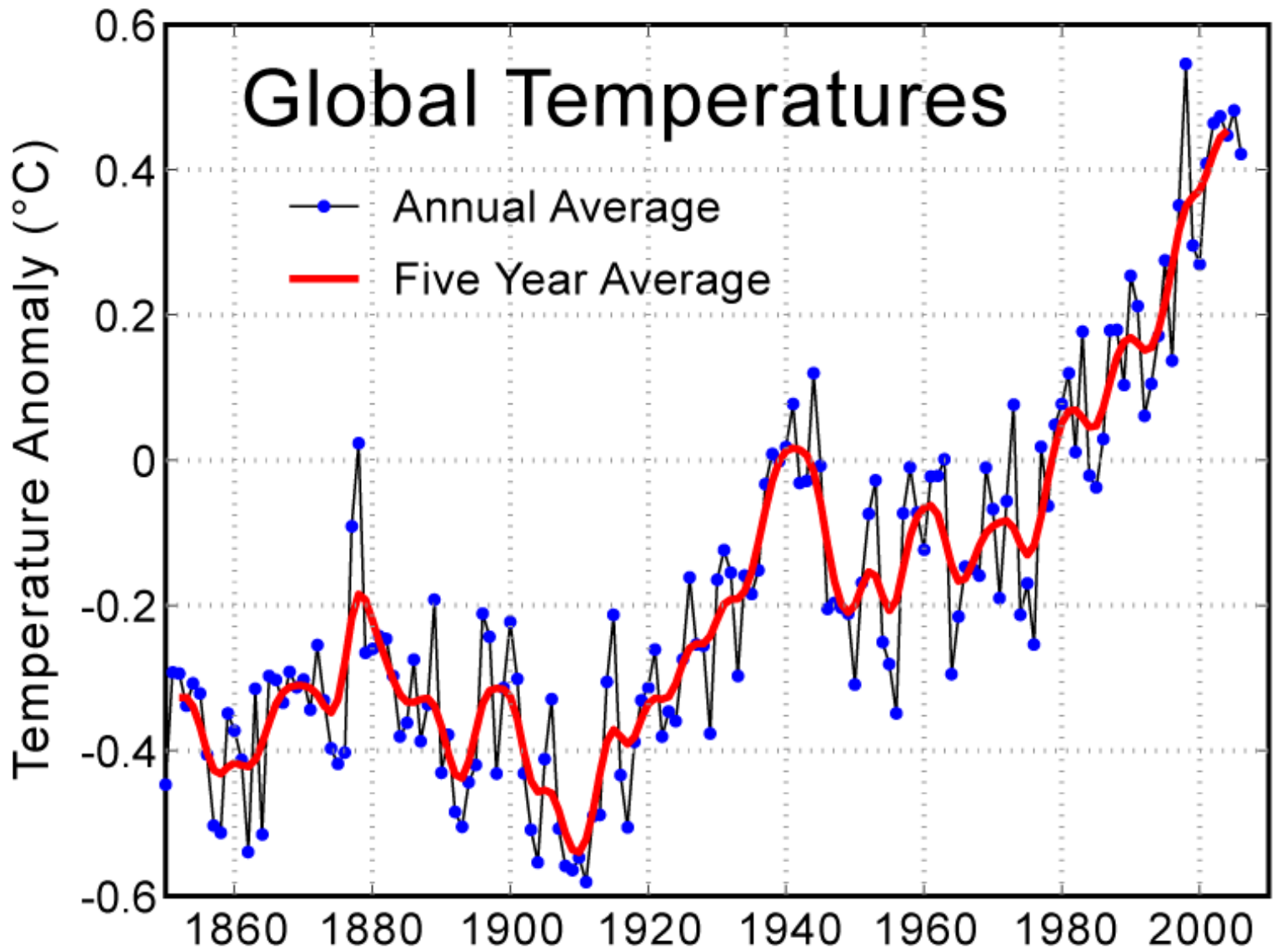
Mother Nature Intervenes



Mother Nature Intervenes

# Atmospheric CO<sub>2</sub> at Mauna Loa Observatory





# Climate Change

A vast field of snow globes, each containing a miniature scene, is arranged in a dense grid across a snowy landscape. The globes are set against a backdrop of snow-covered ground, trees, and utility poles under a clear sky. The scene is a visual metaphor for the impact of climate change on the environment.

# Forces Protest Climate Change

# **The Challenges**

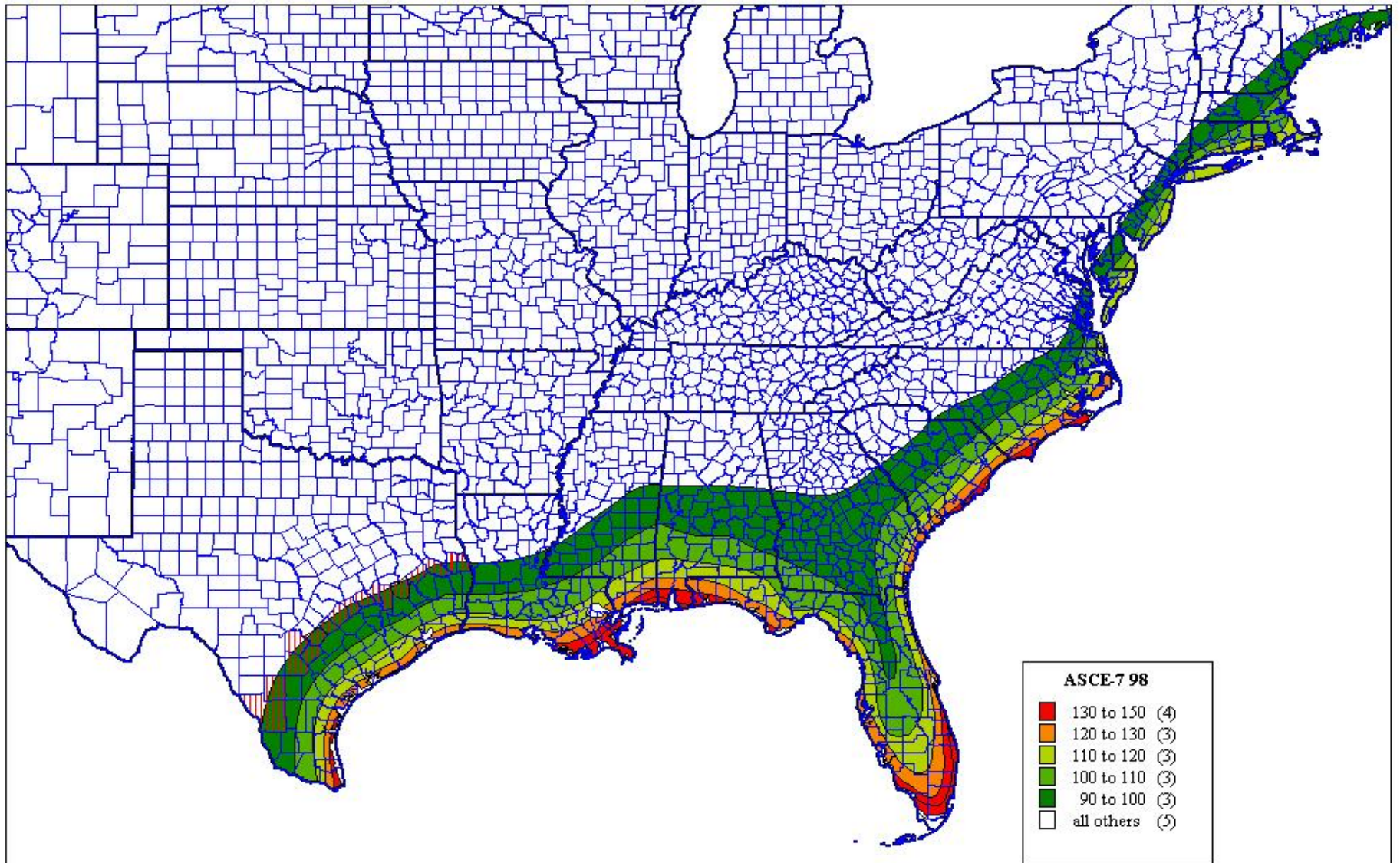
**Tidal Waves**

**Climate Change**

**Storms**

**Wind**

**Storm Surge**



# Wind

Texas counties along the 90 mph contour are highlighted to exemplify county-wide Fortified Hurricane Requirements when a large part of the county has a basic wind speed of 90 mph or greater.





**Solutions Exist**



Solutions Exist

# **Concrete Home Systems**

**Concrete Masonry**

**Precast Concrete**

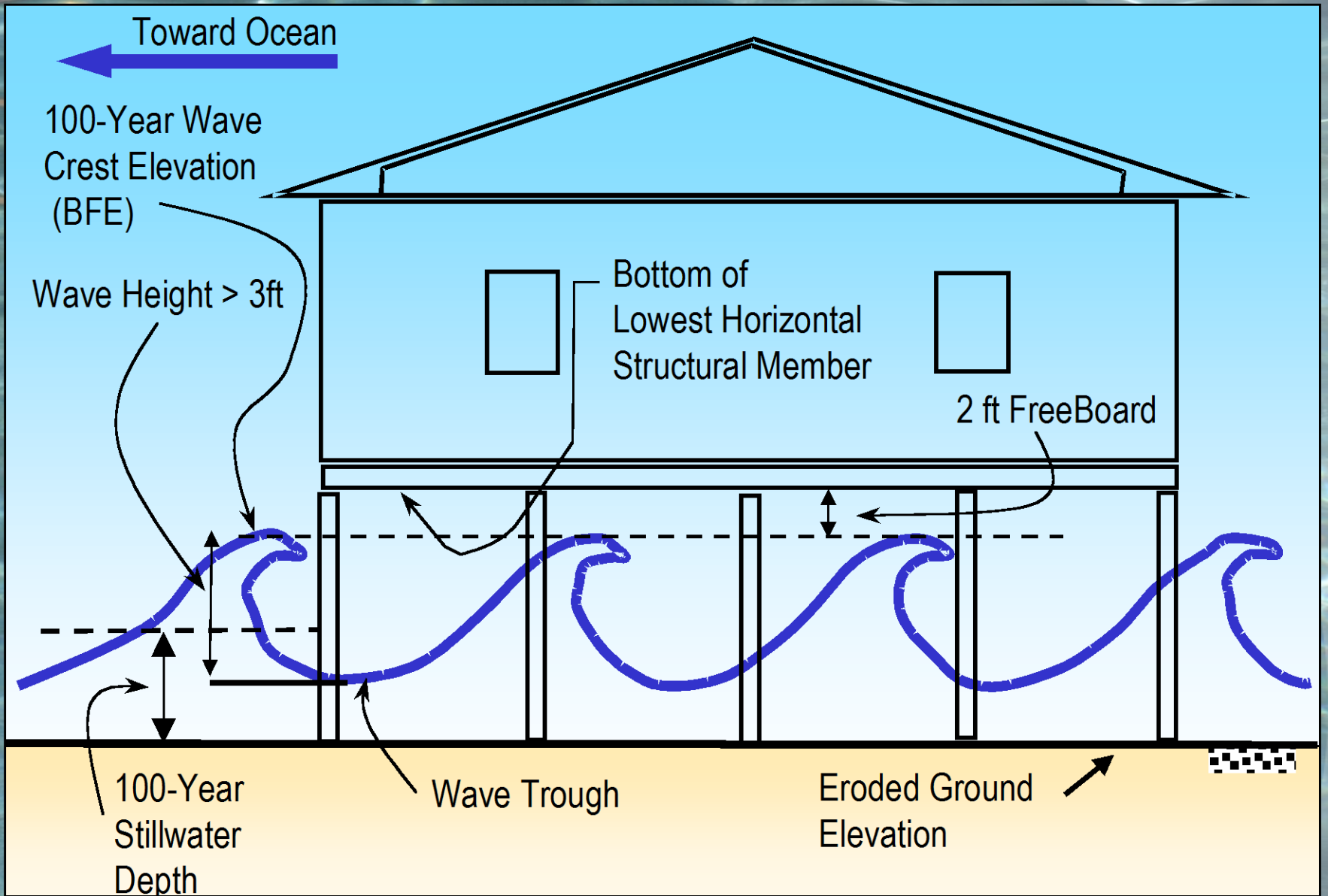
**Site Cast Tilt-Up**

**Cast-in-Place**

**ICF's**

**Tunnel Forming**

**Removable/Reusable Forms**



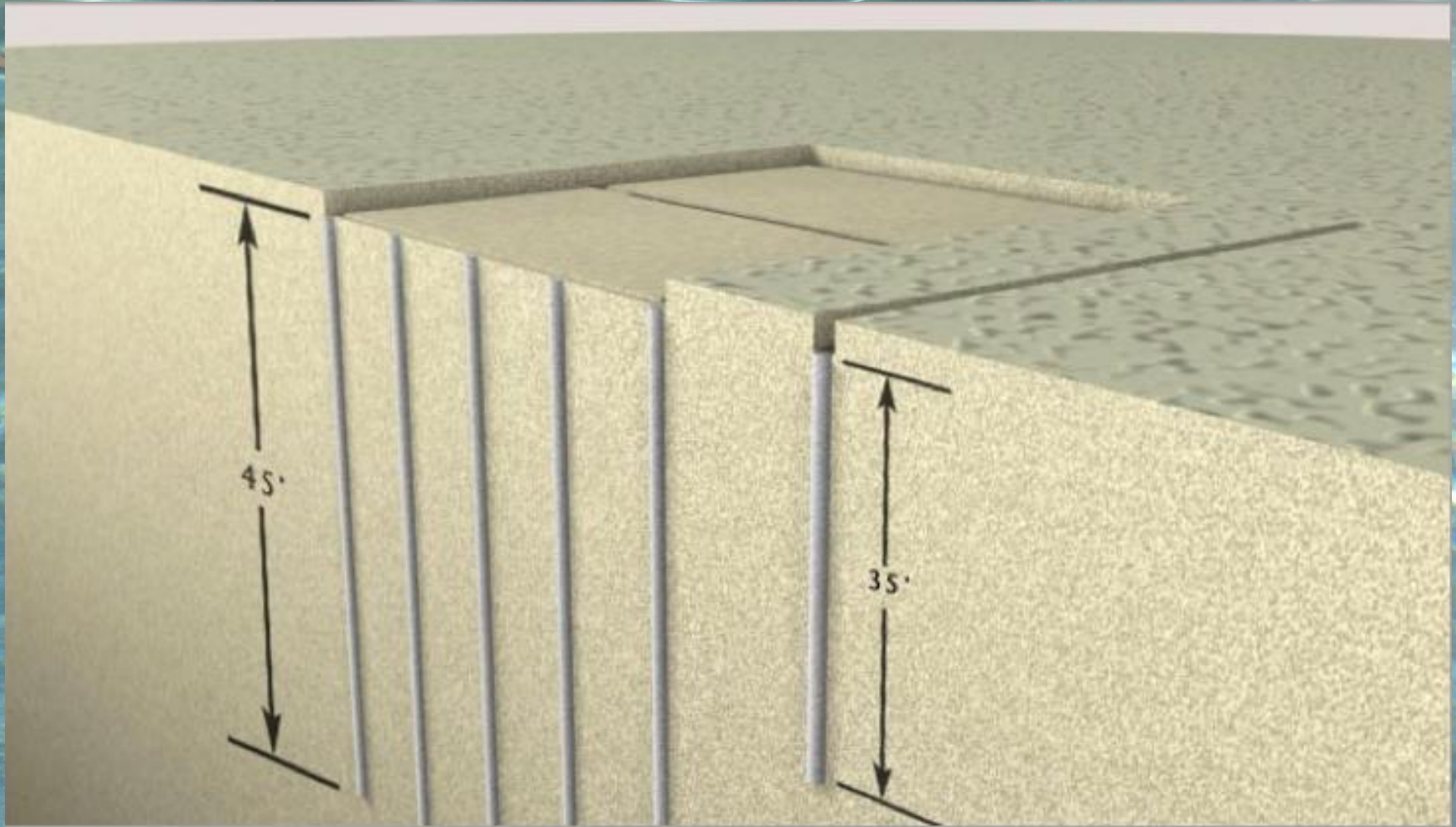


**Removable Concrete Forms**

**A Coastal Housing  
Alternative**

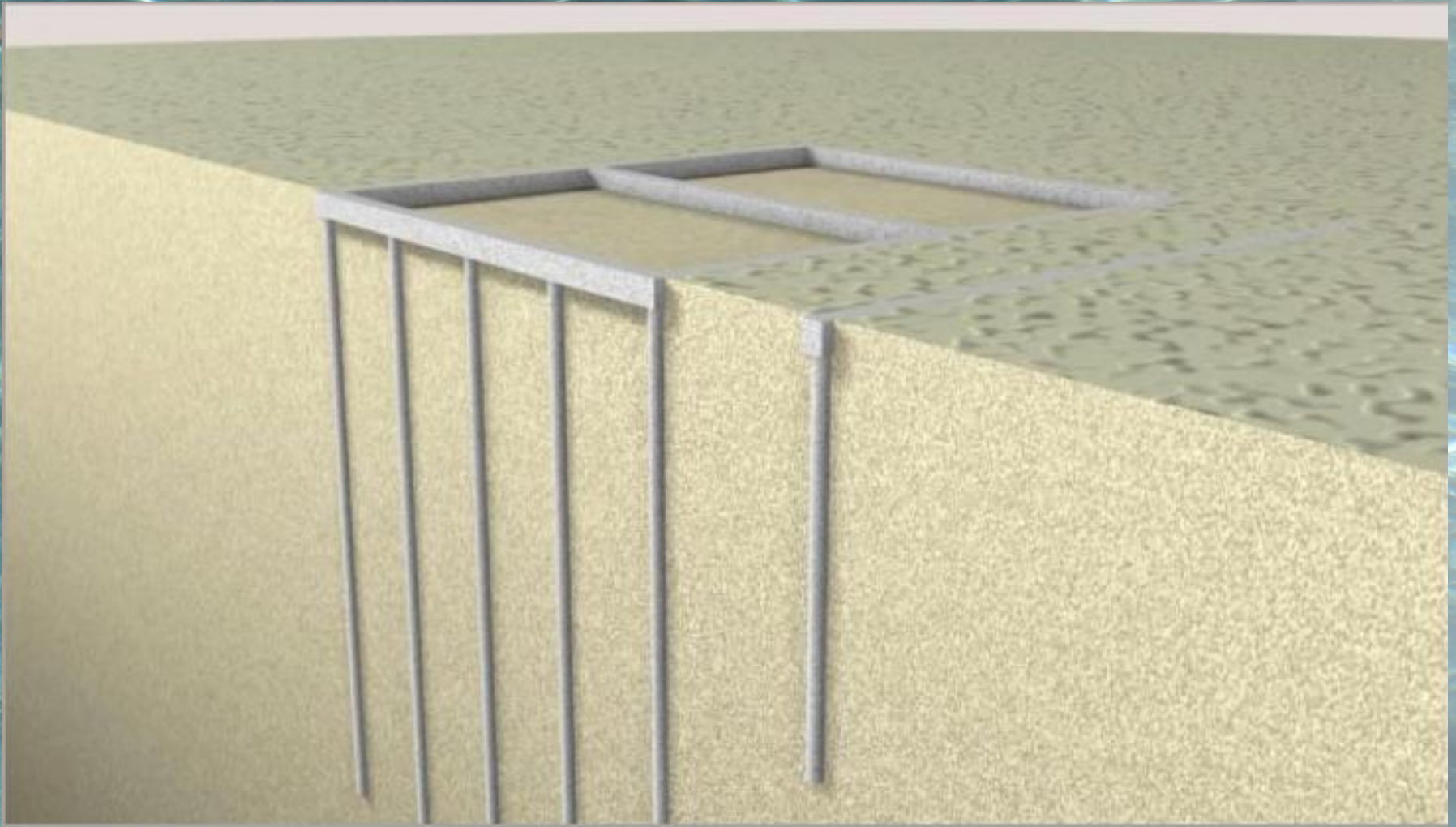
**Top Sail Island,  
North Carolina**

# Concrete Homes Using RCF's 27 Auger Cast Pilings





# Concrete Homes Using RCF's Grade Beam Connection

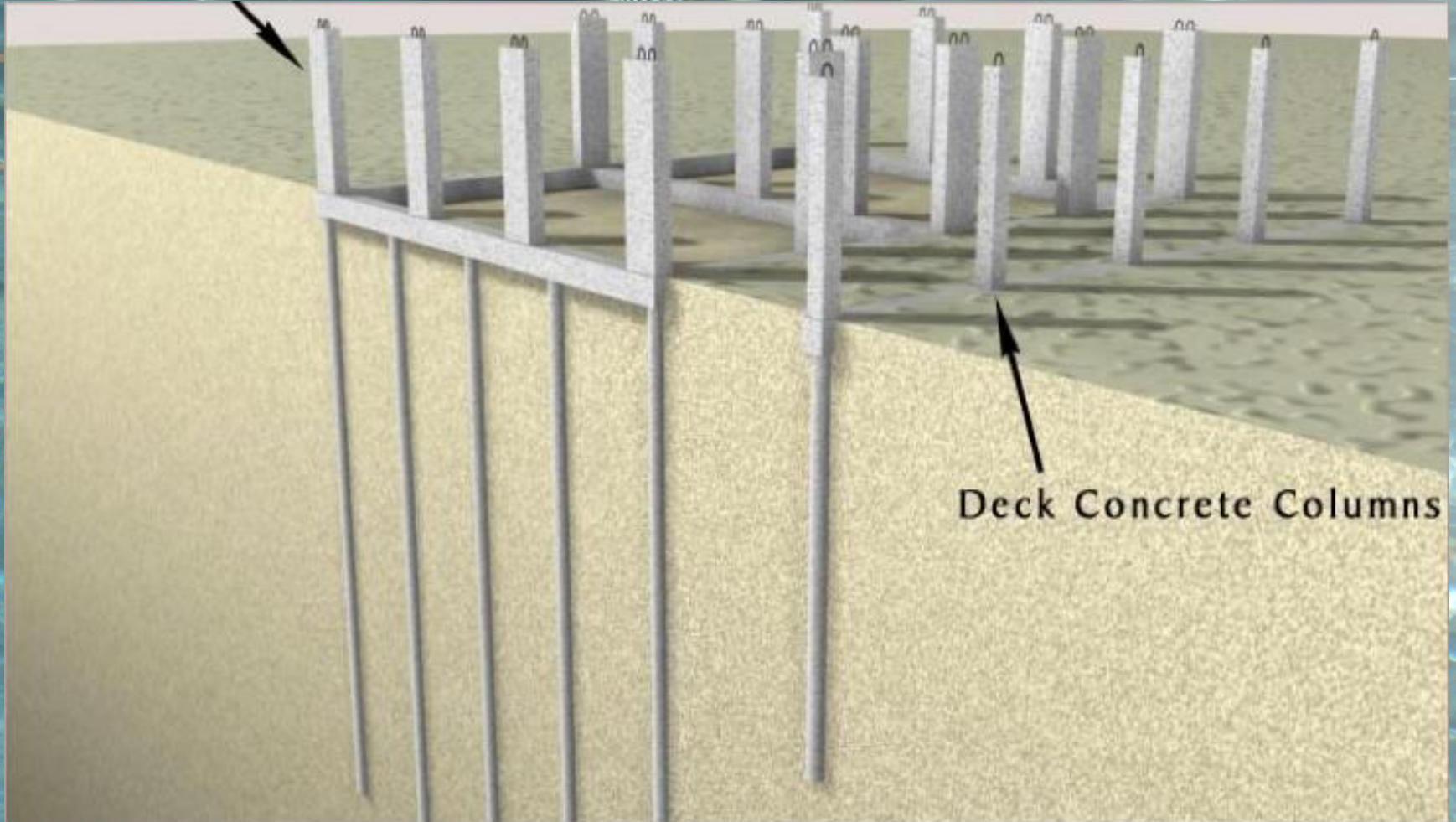




**Concrete  
Homes  
Using  
RCF's**

**Grade  
Beam**





Deck Concrete Columns

**Concrete Homes Using RCF's**

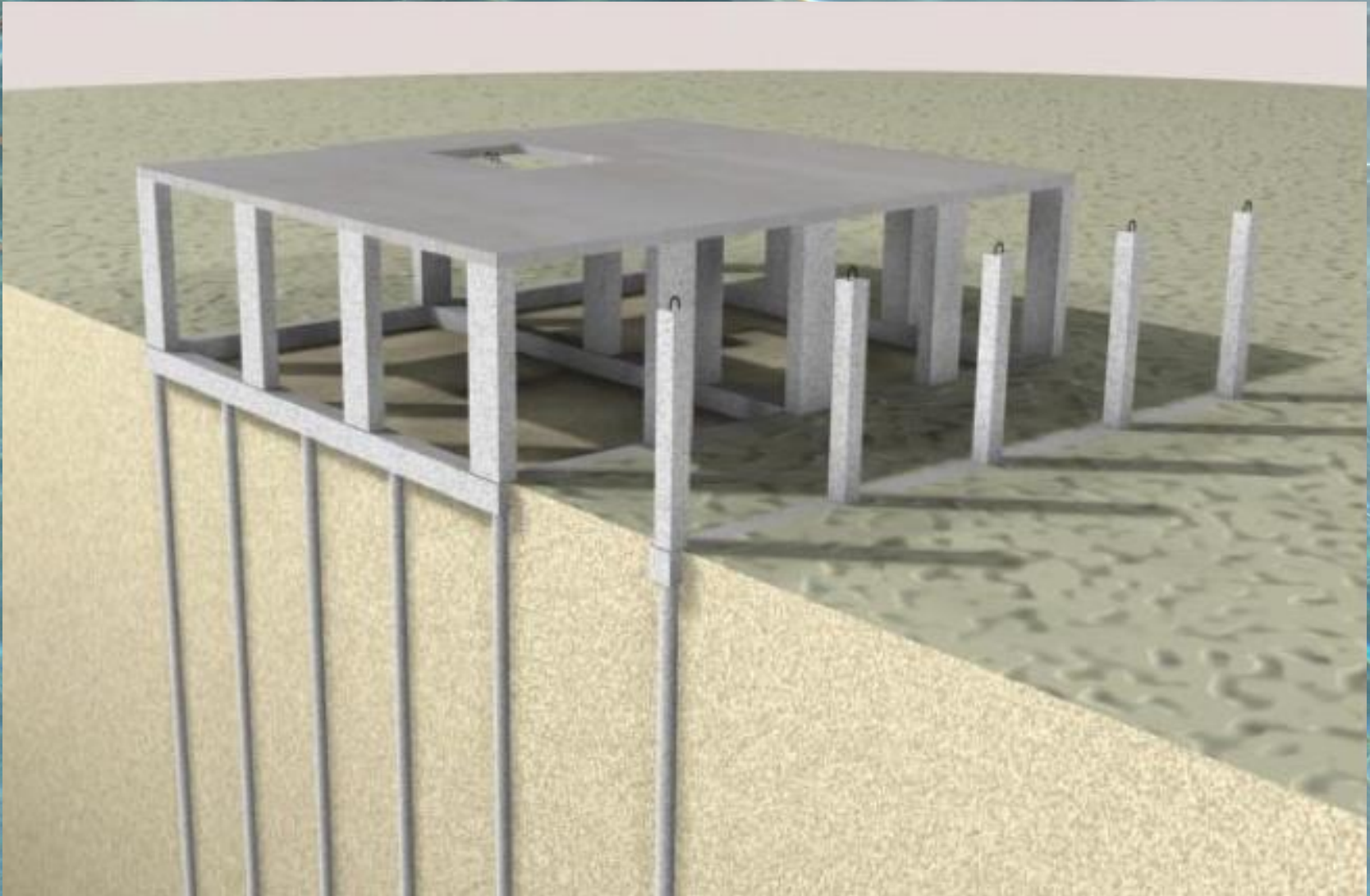


**Concrete Homes Using RCF's**



**Deck Support  
Columns**

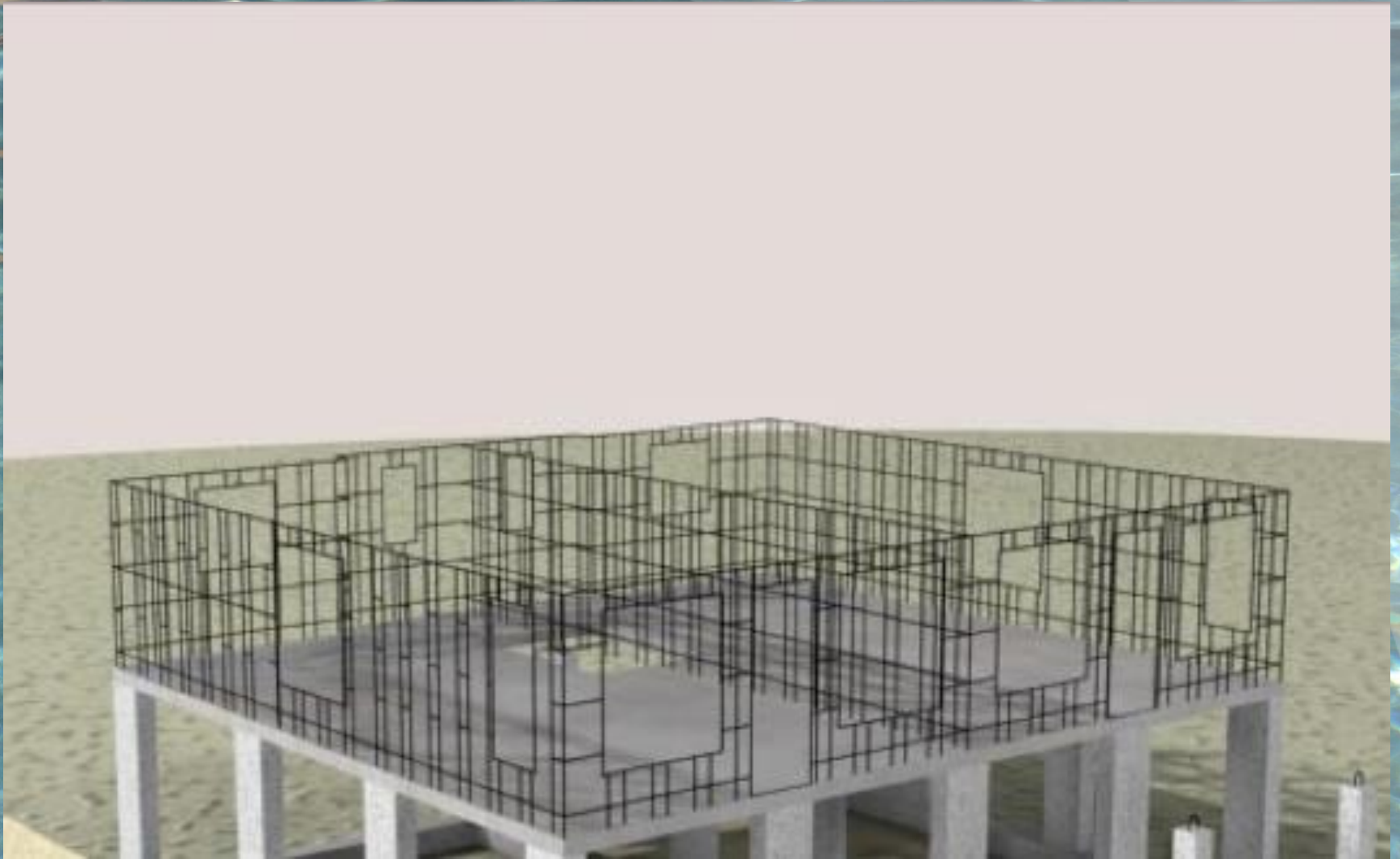
**Concrete  
Homes Using  
RCF's**



**Concrete Homes Using RCF's**



**Concrete Homes Using RCF's**



**Concrete Homes Using RCF's**

# Concrete Homes Using RCF's





# Concrete Homes Using RCF's



# Concrete Homes Using RCF's



# Concrete Homes Using RCF's





**Concrete Homes Using RCF's**

# Concrete Homes Using RCF's

- ▶ **Break Away Form Tie**
- ▶ **Attachment Flange for Exterior Finish**
- ▶ **Interior Thermal Mass**





Concrete Homes Using RCF's



**Concrete Homes Using RCF's**



**Concrete Homes Using RCF's**





**Concrete Homes Using RCF's**



**Concrete Homes Using RCF's**

# Concrete Homes Using RCF's





**Concrete Homes Using RCF's**



# Finishing Walls

# Concrete Homes Using RCF's





**Concrete Homes Using RCF's**



**Concrete Homes Using RCF's**



# **Solutions Exist**

- **Materials**
- **Systems**

# **Challenges Remain**

- **Codes & Regulations**
- **Insurance & Banks**
- **Builders & Designers**
- **Owner Misconceptions**



**Concrete Homes Using RCF's**