

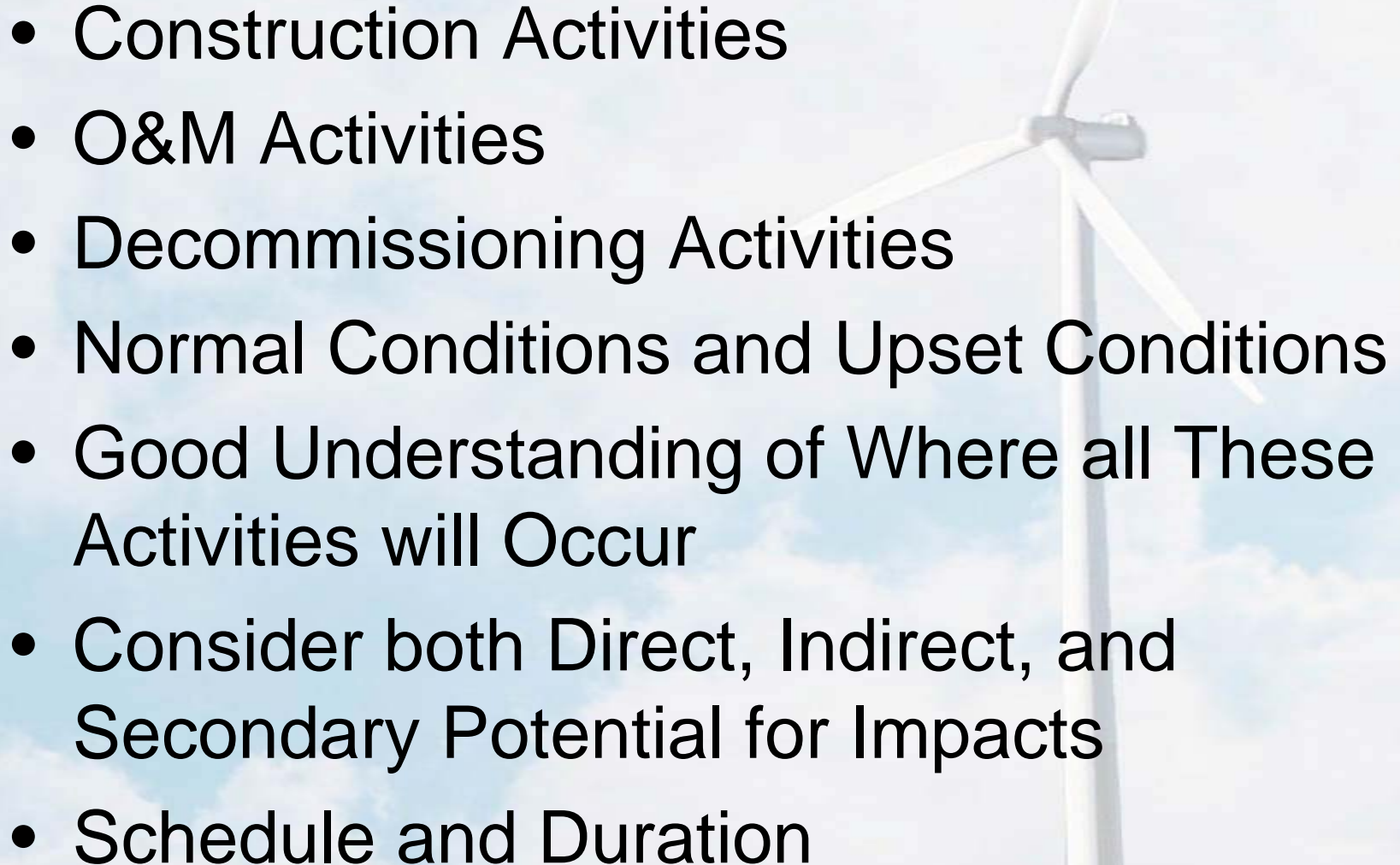
A white wind turbine is positioned on the right side of the frame, extending from the bottom towards the top. The background is a bright blue sky filled with soft, white, wispy clouds. The overall scene is clean and modern, representing renewable energy.

# Environmental Impacts Of Offshore Wind Energy

Paul Martin

TRC Environmental Corporation

# Need to Understand Characteristics of all Project Phases

- Construction Activities
  - O&M Activities
  - Decommissioning Activities
  - Normal Conditions and Upset Conditions
  - Good Understanding of Where all These Activities will Occur
  - Consider both Direct, Indirect, and Secondary Potential for Impacts
  - Schedule and Duration
- 
- A white wind turbine is visible in the background, partially obscured by the text. The turbine has three blades and is set against a bright blue sky with scattered white clouds. The overall scene is clean and modern, representing renewable energy.

# Physical Resources

A white wind turbine is visible on the right side of the slide, set against a background of a blue sky with scattered white clouds. The turbine's tower, nacelle, and three blades are clearly visible, extending from the bottom right towards the top right of the frame.

- Geology and Sediments
- Water Quality
  - TSS, DOM, Salinity, Temperature
- Tidal Currents and Waves
- Air Quality and Meteorological
- Noise
- EMF

# Biological Resources

A white wind turbine is positioned on the right side of the slide, extending from the bottom towards the top. The background is a bright blue sky with scattered white clouds. The turbine's three blades are visible, and the tower is a solid white vertical line.

- Vegetation
  - Seagrass
  - Macroalgae
- Avifauna
  - Shorebirds and Wading Birds
  - Shearwater, Gannets, Petrels (Pelagics)
  - Gulls, Terns
  - Waterfowl and Seaducks
  - Raptors, Passerines (Terrestrial)

# Biological Resources cont.

- Benthos
  - Meiofauna
  - Macrofauna
  - Shellfish
- Plankton
  - Zooplankton
  - Phytoplankton
  - Pelagics



# Biological Resources cont.

- Marine Mammals
  - Cetaceans (Whales, Porpoises, Dolphins)
  - Pinnipeds (Seals, Walrus)
- Sea Turtles
- Fish
  - Demersal
  - Pelagic
  - Diadromous
  - Commercially Important

# Biological Resources cont.

- Threatened and Endangered Species
  - Birds
  - Marine Mammals
  - Sea Turtles
- Miscellaneous
  - Bats
  - Insects
  - EFH



# Societal/Human Resources

A white wind turbine is positioned on the right side of the slide, extending from the bottom towards the top. The background is a bright blue sky with scattered white clouds. The turbine's tower, nacelle, and three blades are visible, though the blades are slightly blurred, suggesting motion or a shallow depth of field.

## ➤ Economics

- Construction and Manufacturing
- O&M Services
- Tourism
- Real Estate

## ➤ Infrastructure

## ➤ Visual

- Onshore
- On the water

# Societal/Human Resources cont.

## ➤ Cultural

- Historic
- Pre-Historic
- Tribal Culture

## ➤ Recreation and Tourism

- On-shore
- Water based



# Societal/Human Resources cont.

## ➤ Navigation

- Recreational
- Commercial
- Ports

## ➤ Aviation

- VFR
- IFR



# Societal/Human Resources cont.

## ➤ Telecommunication

- Phone and Radio
- TV
- Radar

## ➤ Competing Uses

- Mineral Extraction
- Fishing
- Boating
- Military Training



# Definition of Impact Levels

- Consider how much of the resource is impacted within a defined location
- Consider the viability of the resource if impacted
- Consider how recovery is affected
- Consider whether there is useful mitigation
- Cape Wind EIS used Negligible, Minor, Moderate, and Major, separately for Physical/Biological resources and Societal Resources