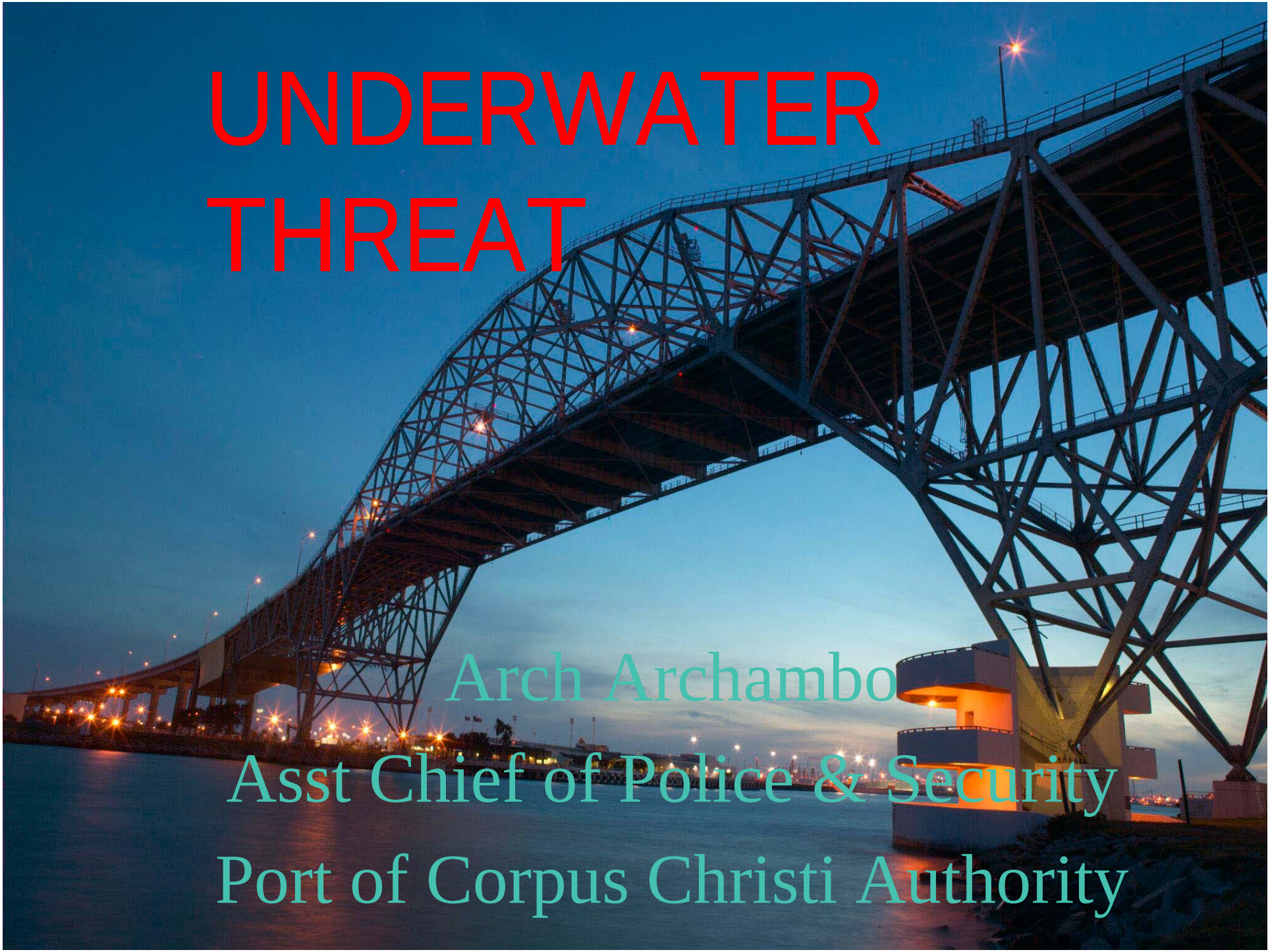

UNDERWATER
THREAT
Arch Archambo
Asst Chief of Police & Security
Port of Corpus Christi Authority

The Threat

Diver delivered explosive

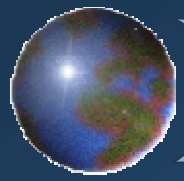
- SCUBA
  - Cheap – easy to train
  - Bubbles – give away
  - Limited endurance
- Rebreather
  - Intensive training
    - Combat professionals
  - No tanks
  - endurance

Harbor Conditions

- Low visibility
- High traffic area
- Restricted operations area
- Surveilled/patrolled

Options to locate divers

- Visual – surface – underwater camera
- Infrared – not convinced yet
- Random explosive devices – not PC
- Sonar

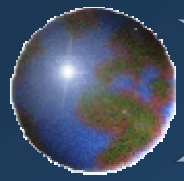


Sonar Types

- Passive – Great for classification and monitoring
- Active – Great for distance locating

History

- Rudimentary active sonars – WWI
- Sonic Depth Finder (SDF) – 1920s
  - Led to in detailed depth and bottom surveys
- Sound Velocity Profile (SVP) – early WWII



Applications

- WWI and WWII – Both shallow and deep water acoustics studied
- Cold War – Research shifted abruptly to deep water only
  - Ballistic Missile Subs
- Post Cold War – Focus is back to shallow water
  - Regional Conflicts

Shallow water acoustics

- Noisy – marine life, shipping, waves
- Bottom bounce
- Surface effects
- SVP

System requirements

- Low false alarm rate
- Integrate with surveillance software
- Automatic tracking management
  - Detection distances – 100s of yards
  - Operators – limited specialist background
  - Low signature targets

Rules of Engagement

- Installed Sonar
- Valid Contact
- Unresponsive
- What now Coach?