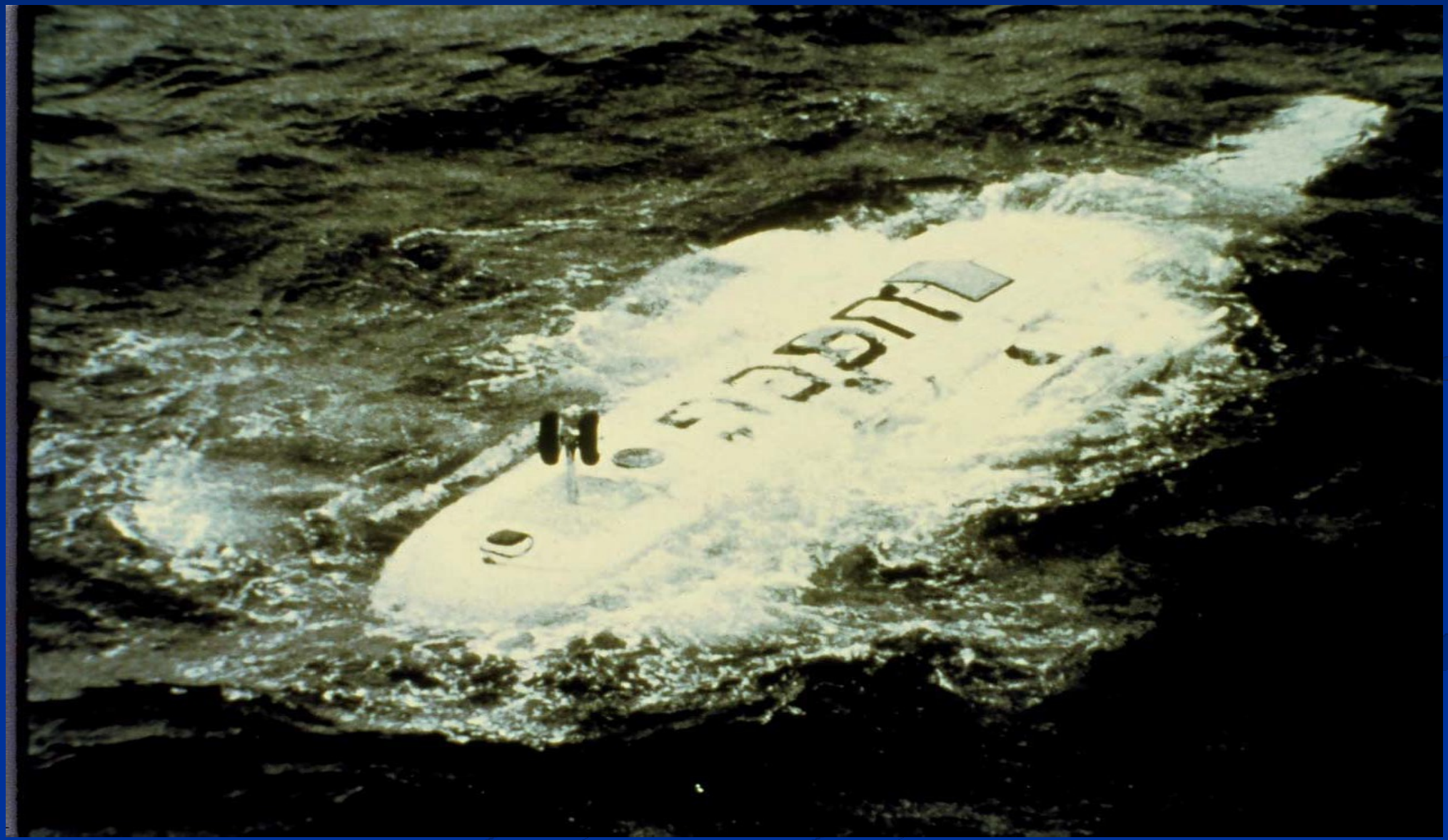
# Young Fishermen Initiative Workshop

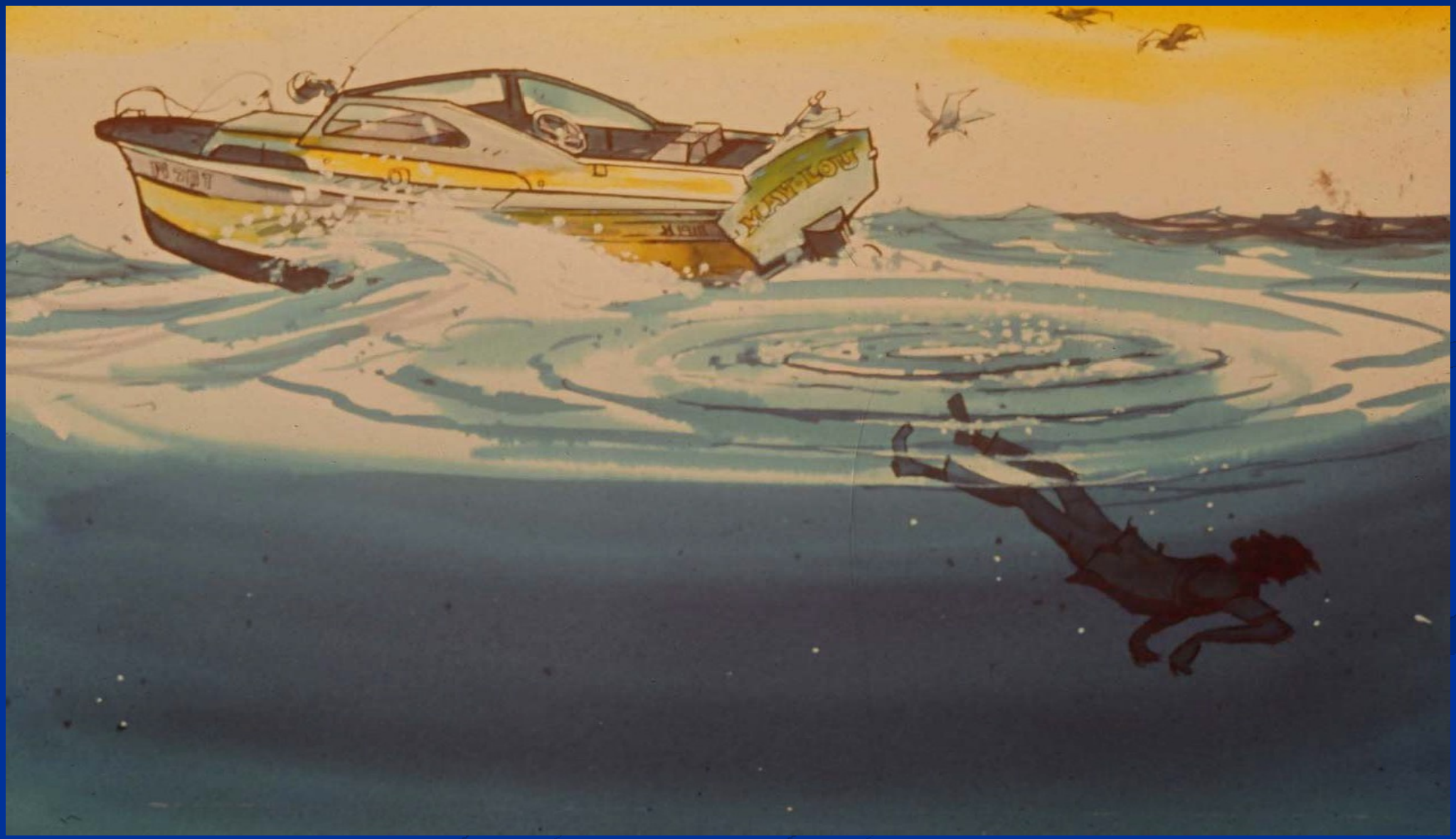
## Hypothermia, Drowning and Cold-Water Survival

# Disasters at Sea

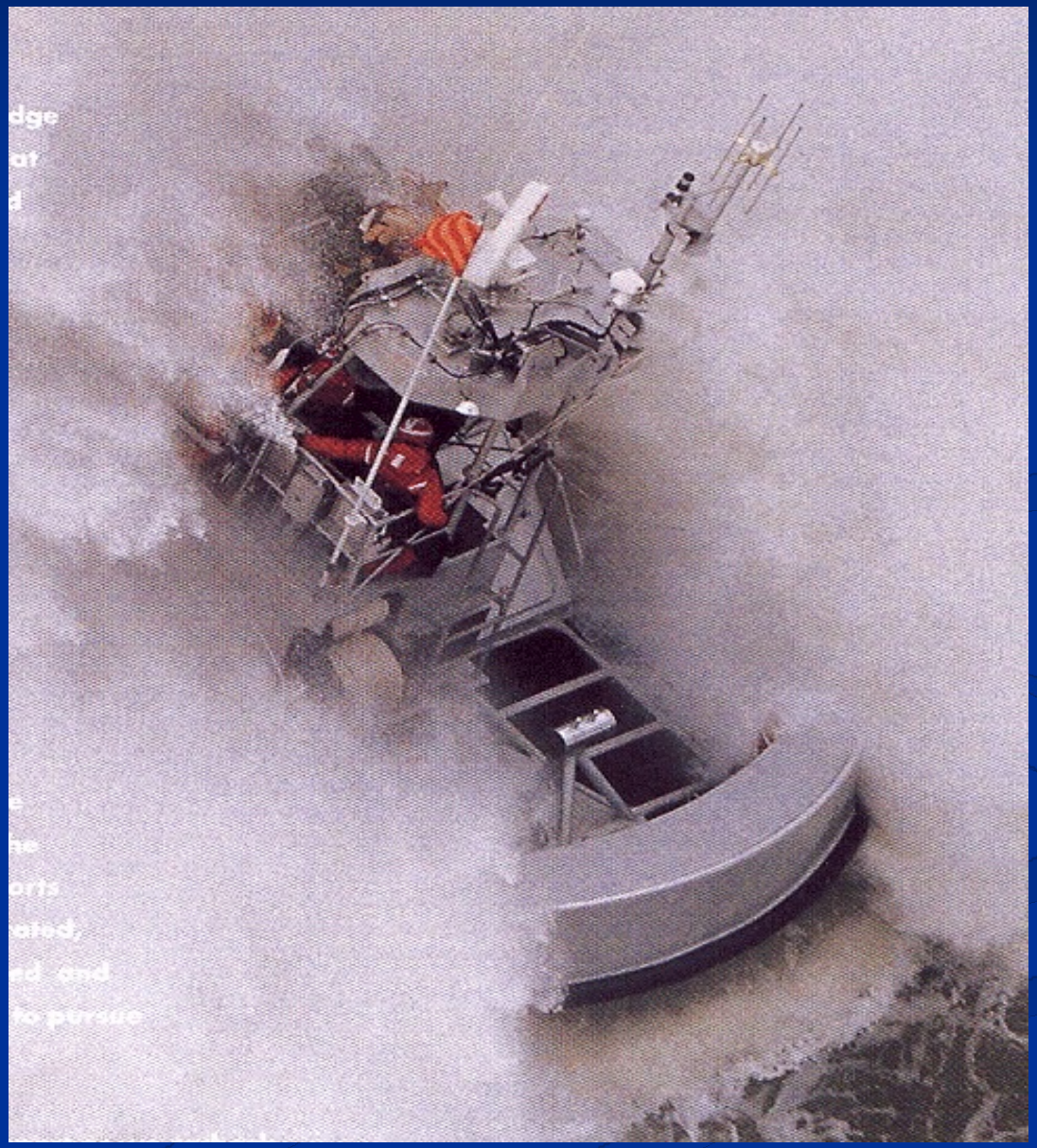
# Aircraft Ditching at Sea



# Falling Overboard



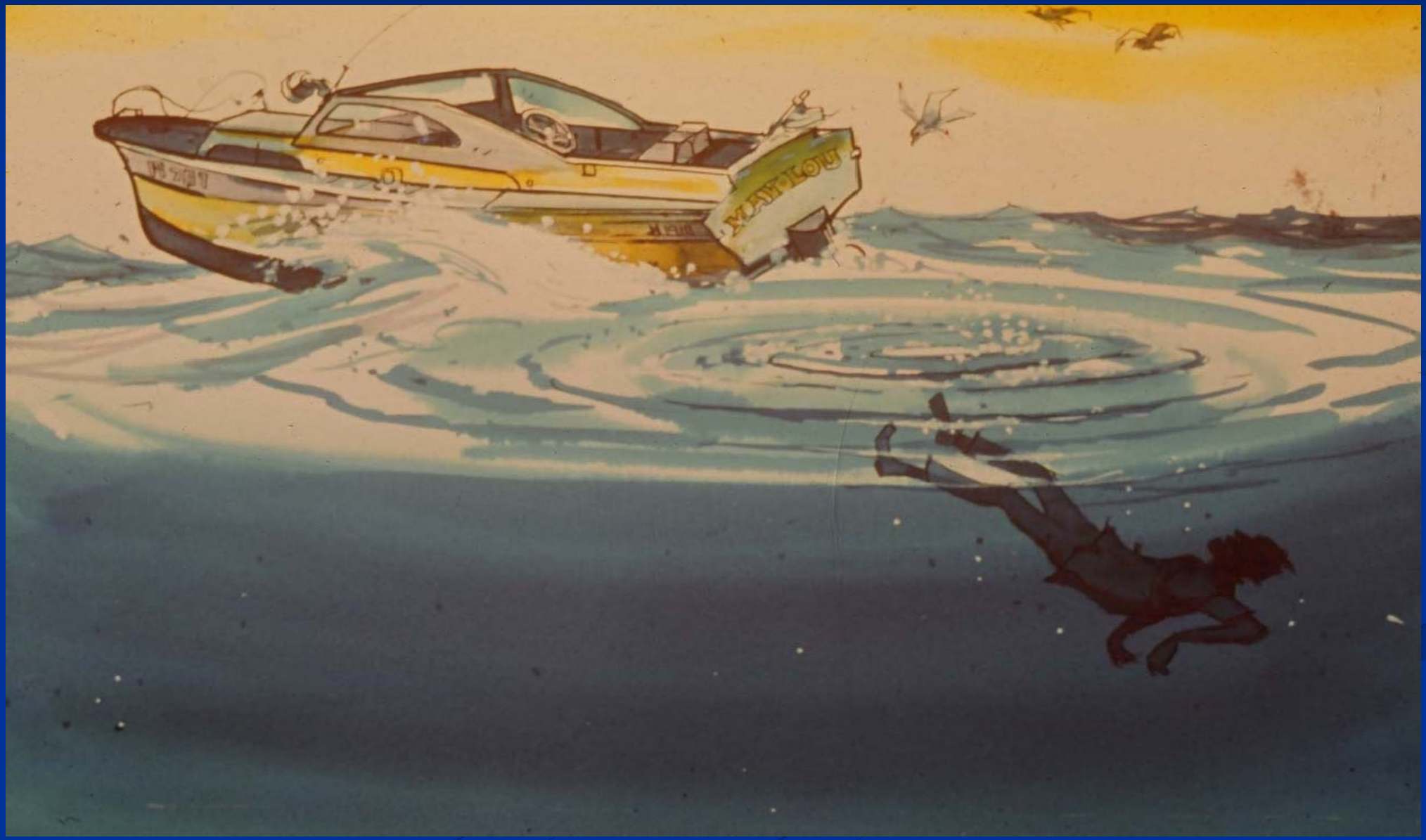
# Washed Overboard



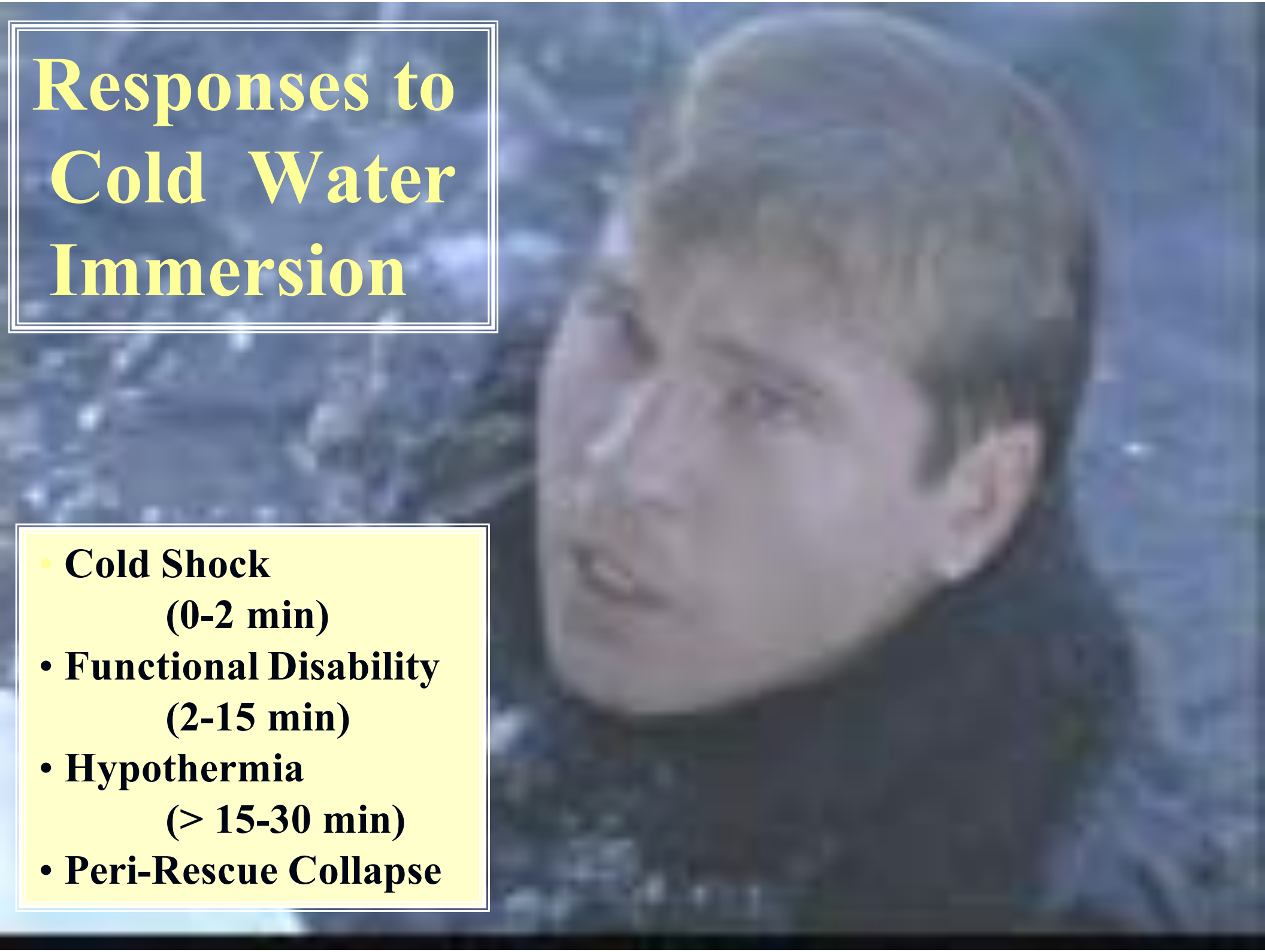

Understand Cold Exposure:
Immersion vs Submersion
Immersion - Head Out!


Submersion = Head In !!

# Physiological Responses to Sudden Immersion in Cold Water



# Responses to Cold Water Immersion



- Cold Shock
  (0-2 min)
- Functional Disability
  (2-15 min)
- Hypothermia
  (> 15-30 min)
- Peri-Rescue Collapse

# Cold-Shock Response

- Occurs immediately upon entry
- Lasts up to 2 minutes
- Caused by stimulation of truncal skin nerve endings
- The colder the water, the stronger the response

# Cold-Shock Response

- Gasp reflex
- Hyperventilation
- Difficulty holding your breath
- Tachycardia (rapid heart rate)
- Hypertension (elevated blood pressure)

# When and How You Can Die in Cold Water

## 1) Cold Shock Response

**(0-2 minutes)**

Gasp → Drown

(Keep head out of water)

Hyperventilation → Faint
→ Drown

(Don't panic, keep calm)

Cardiac Work → Cardiac Arrest

(If existing heart problems)

# Incapacitation in Cold Water

- Difficulty swimming
- Loss of functional ability
- Increased viscosity of cold water
- Loss of manual dexterity
- Muscle cramping
- Swimming speeds onset of hypothermia

# When and How You Can Die in Cold Water

## Local Cooling Decreases Performance Or Functional Disability

**(2-15 minutes)**

- **If you can't get out in 5-15 minutes, you might not get out on your own power!**
- **If so, prepare to survive.**
- **Widen window of opportunity for rescue.**
- **Thrashing around will**
  - **increase heat loss**
  - **cause exhaustion (Drowning)**

# When and How You Can Die in Cold Water

## Onset of Hypothermia

(>30 minutes on)

- Cooling to UNCONSCIOUSNESS
- If head goes under,
  Drowning (30-120 minutes).

- If head above water…
- Cooling to CARDIAC ARREST,
  Death (90-180 minutes or more, depending on water temp, body size, etc.)

# Summary of Cold Water Risks

- Cold Shock (0-2 minutes)
- Functional disability (2-30 minutes)
- Hypothermia (>30 minutes)

# Role of Flotation

- PFDs, immersion suits, etc. can assist in surviving cold-shock & swim failure
- Rough seas remain a significant risk, even with flotation assistance
- Immersion suits can assist in prevention of hypothermia, if properly donned

Hypothermia results when more heat is lost from the body than is produced (through metabolism and shivering) and retained (through body-fat, clothing, and behavioral adaptation).

# Physiology of Hypothermia

- Hypothermia defined as core temp < 95 deg F.
- Every organ system is affected (e.g., similar to multiple trauma)

# Physiology of Hypothermia

- Constriction of surface blood vessels
- Cold sensation and shivering
- Physical impairments (motor skills)
- Mental impairment
- Cold-induced urination

# Physiology of Hypothermia

- Abnormal heart beats and slowing of the heart rate
- Declining blood pressure
- Decreased metabolism
- Cessation of shivering
- Loss of consciousness
- Ventricular fibrillation / Cardiac arrest

# Classification of Hypothermia

- 35-37 deg C: cold-sensation, shivering, constriction of surface blood vessels
- 32-35 deg C: Mild hypothermia; physical and mental impairments

# Classification of Hypothermia

- **28-32 deg C: Moderate hypothermia**; cessation of shivering, abnormal heart beats, loss of consciousness

- **<28 deg C: Severe hypothermia**; vital signs reduced or absent; spontaneous ventricular fibrillation or cardiac arrest

# HELP Position

# Huddle Technique

# PFDs

# PFDs

# PFDs in 10 Deg C (50 Deg F) Water

Head In, Body In

Head Out, Body In

# Questions