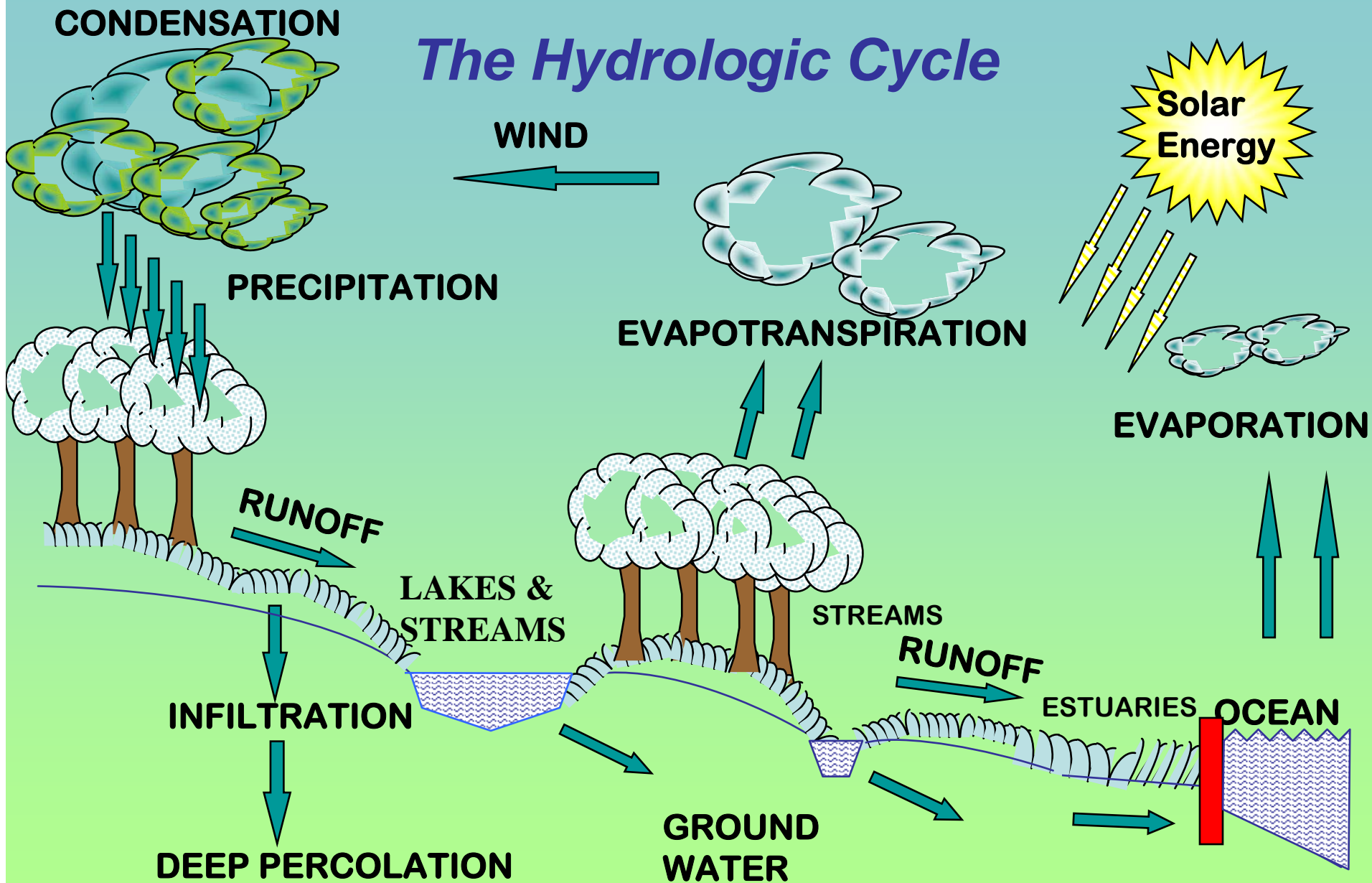


# The Hydrologic Cycle



# IMPACTS OF INCREASED RUNOFF VOLUMES

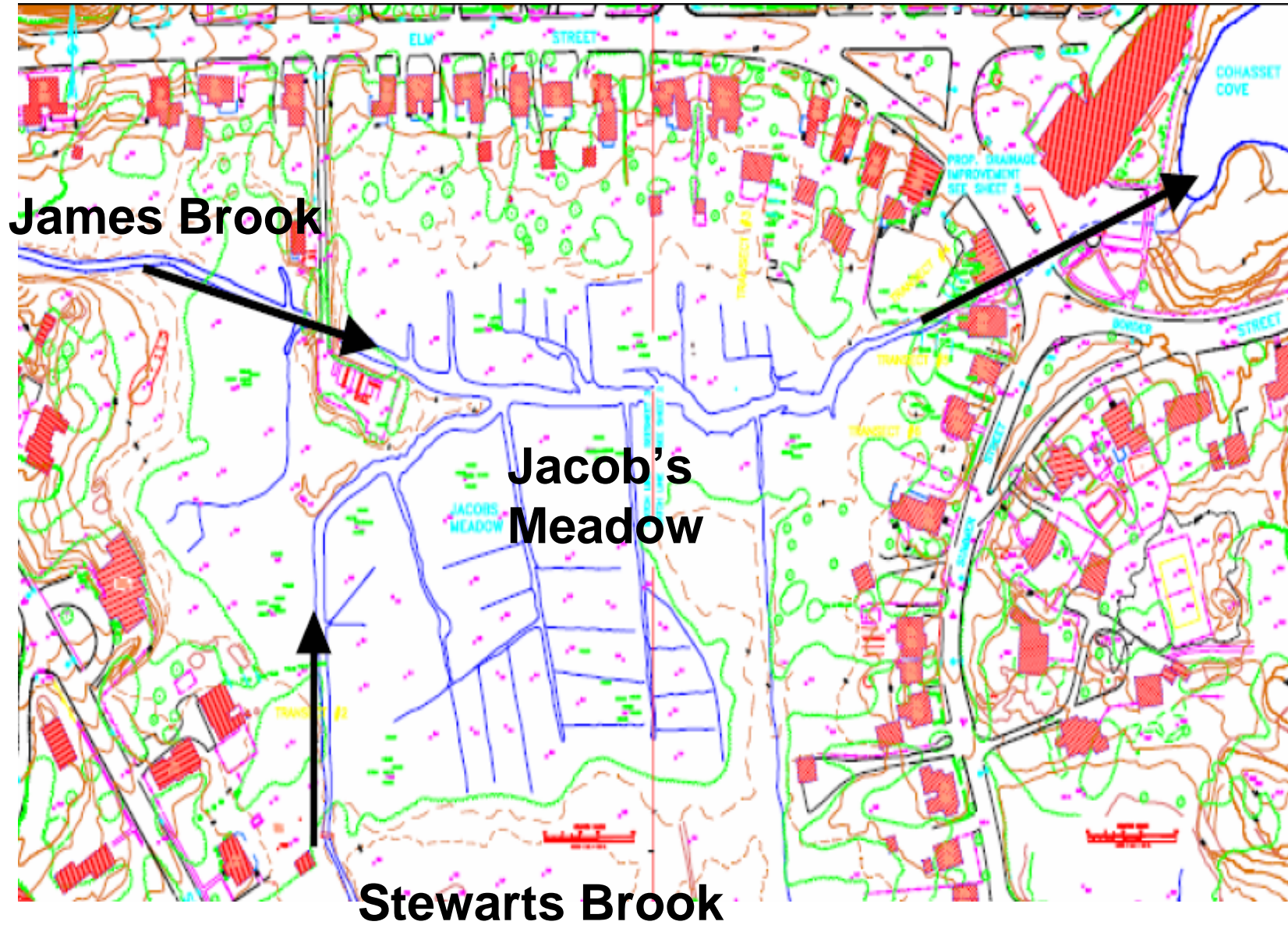
- DOWNGRADIENT **FLOODING** IMPACTS
- DIRECT **IMPACT ON WETLAND** COMMUNITY DUE TO HIGHER VELOCITIES AND HIGHER/MORE FREQUENT FLOOD LEVELS (**SALT MARSH IMPACTS**)
- DEPRESSION OF **SALINITY** IN MARINE RECEIVING WATER SYSTEMS (**COVE AND HARBOR**)
- INCREASED NON-POINT **POLLUTION** LOADINGS CREATING RECEIVING WATER QUALITY IMPACTS
- HIGHER DEMAND ON **MUNICIPAL SERVICES** MEANING ECONOMIC AND INFRASTRUCTURE IMPACTS
- PUBLIC **HEALTH AND SAFETY** ISSUES
- LESS **AQUIFER RECHARGE** IMPACTING BASE-LINE STREAM FLOWS AND WATER SUPPLIES

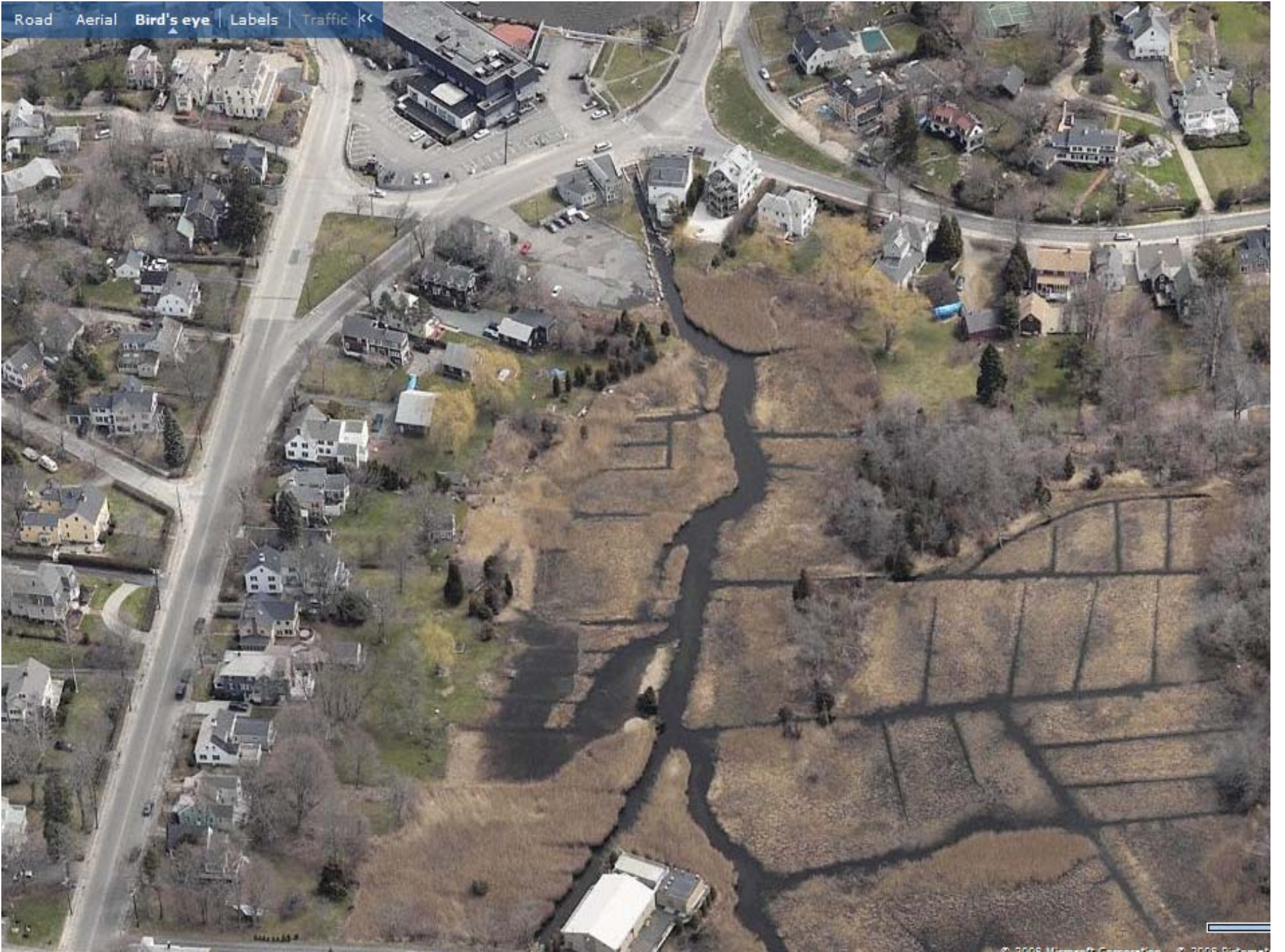




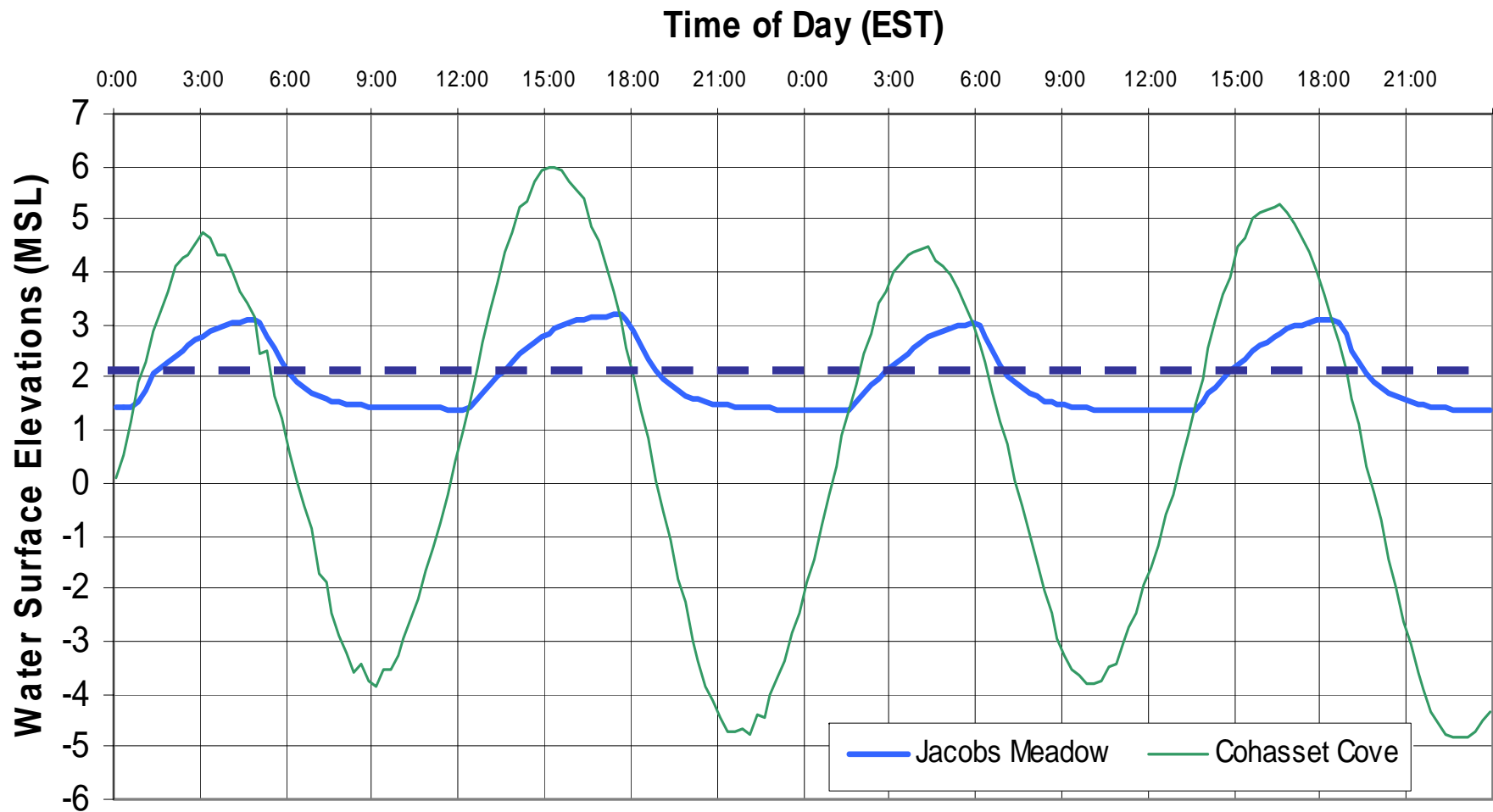








# Normal Tidal Conditions



# More Recent Factors Worsening Flood Conditions

- Increased impervious area creating an increase volume of stormwater runoff and less infiltration
- Reduced watershed infiltration and storage
- Ability of system to convey flow through watershed enhanced over the years
- Recent intensity of storms, significant rainfall over short durations restricted by tides
- Reduced outfall hydraulics (Channel deterioration)
- Reduced Jacobs Meadow storage
- Sea Level Rise continues  
(**26 cm in last 100 years, 50 cm (20") in next 100 years**)



# James Brook

## Outlet Improvements

- Maximize Outflow capabilities via improve channel and outfall hydraulics
- Allow less restrictive tidal exchange to improve salt marsh *reclamation* efforts
- Still control normal high tide flooding
- Provide improved regulation of flows during storm events
- Facilitate manual opening of tide gate system