

Climate Change: A Pilgrim's Progress at MaineDOT

with a focus on Water Resources

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Pilgrim: a traveler to a holy place

- That holy place: *a safe and efficient* transportation system that complies with all applicable Federal and State laws
- The big picture: this already captures Climate Change concerns
 - Just need some minor clarification and guidance
 - And maybe a little push
 - And maybe (more than) a little \$\$



Runoff & Sea Level Rise in Maine: A Two-Headed Beast

- Runoff: hydraulic capacity issue
- SLR: asset elevation issue



***The Bad:
A Coastal State***

***The Good:
Not Urban***



**Culverts have been
our biggest challenge**

***Solution: apply bridge
hydraulic design
standards to culverts***



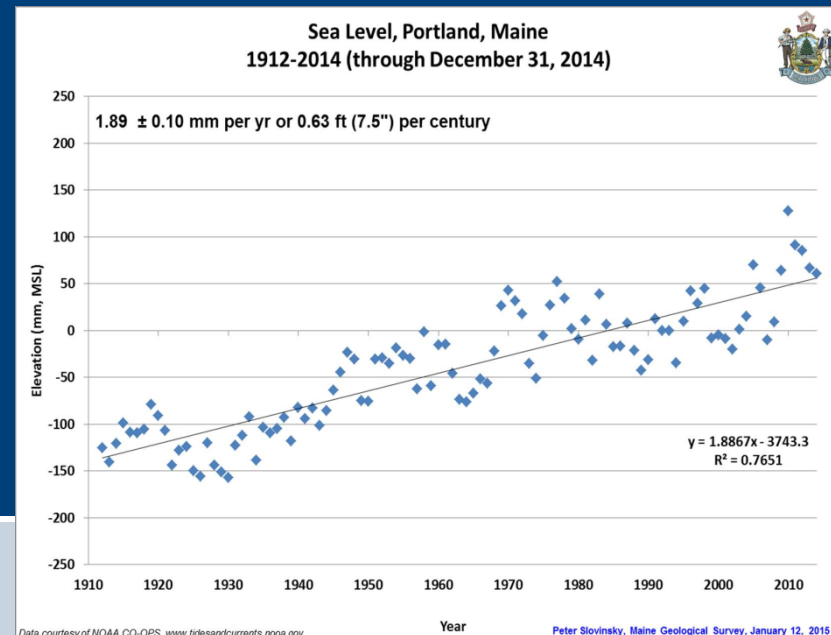
Riverine Peak Flows: Where We're At ...

- A Good Place ...
 - Conservative standard: $H_w/D = 1$ @ Q100
 - Conservative design assumption
 - *Steady flow assumption*
 - Up-to-Date Methods
 - Regression equations & StreamStats
 - Design rainfall curves (used less often)
 - Indications in Peak Flow Data
 - Trends? Inconclusive ...
 - Ongoing research (Collins, Hodgkins, NCHRP)
 - Our biggest need for research & guidance



Tidal Settings & SLR

- *Consider SLR*
 - Project by project
- Data trend: about 1 ft / 100 yrs at Portland
- Model projections: *as much as 6'* in next 100 yrs
- *Maybe the weakest part of MaineDOT's response to climate change*
- Elevation Problem
 - Asset
 - Surrounding roads & land



The Executive Order & Federal Flood Risk Management Std

- Briefly ...
- We are pretty close already
- Some minor tweaking and we can make a good case that we are compliant



A New (for us) Way of Looking at Things

- *Programmatic Risk* (Judy Gates)
 - ***Underpins our several FHWA Pilot Projects***
 - Not primarily engineering or technical
 - Assume the technical challenges can be met
- Climate Change is just one more *risk* that moves us away from business as usual
- Look at these risks systematically
 - To better manage them
 - Eliminate the surprises

But Some Things Still Drive Me Nuts

- We try to do the right thing
- But what are we to do with language like
- “... more frequent, more intense storms ...”
- “... climate change may increase peak flows ...”
- “... SLR could be 500’ 100 yrs from now ...”
- Lots of “could”, “may”, “suggest”
- Easy to say, difficult to act on in a responsible manner





KEEP CALM – DON'T WORRY

- Use up-to-date methods
- View the WHOLE context
- (Maybe) Build (slightly) bigger & higher structures