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Maryland Coast Smart-CRAB Climate Ready Action Boundary And Riverine Advisory Product (In Development)

MASFM / Lunch and Learn

June 2021

Dave Guignet, State NFIP Coordinator
State CTP Mapping Coordinator

Maryland Department of the Environment

Agenda –

- **First 5 minutes – Cover What, Why, Where of Coast Smart Criteria Source Presented at MASFM Spring Conf. (So, take a Break if you already know this)**
- **Show Additional Steps Currently Under Development for Riverine 100-year + 3 feet**
- Explain the **new profile tool for visualizing data for floodplain management** / And discuss the different elevation data sets used
- **Wrap Up with Questions and Answers**

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CS-CRAB
100 year + 3 feet - What is It ?

Tied to Coastal 100 year + 3 feet

- Defines Higher Risk Vertically and Extends Horizontal Proximity in Tidal Floodplains
- Screen State Projects and State Funding for Impacts when Inside 100-year +3 Limit

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Who Needs to Use the CRAB ?

- State Agencies for Projects in Coastal Areas that Cost More than $ 500,000
- Projects that receive State Funding if 50 % or more of the Costs- If State Funding Exceeds $ 500,000
- Note / Roads and Bridges Are Currently Exempt, but likely to be discussed this year

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Brief History of Coast Smart Council

- Maryland HB 615: Coast Smart Council Law | Adaptation ...

- **May 05, 2014** · The Coast Smart Council law ensures Maryland follows standards to make safe and fiscally-wise investments when building or updating State agency structures located in vulnerable coastal areas. The law does not affect schools, roads or local government projects, only structures built by State agencies.

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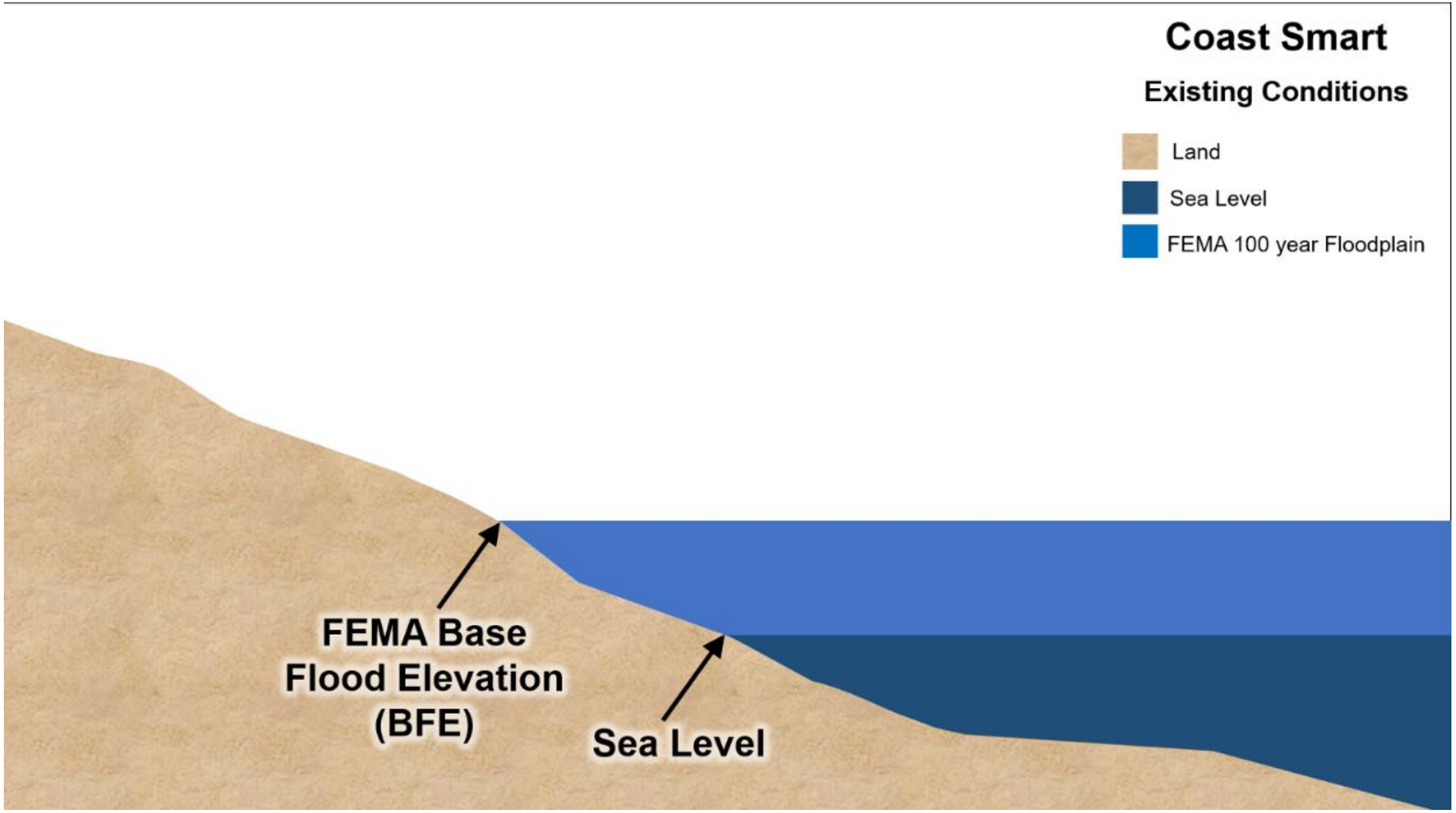
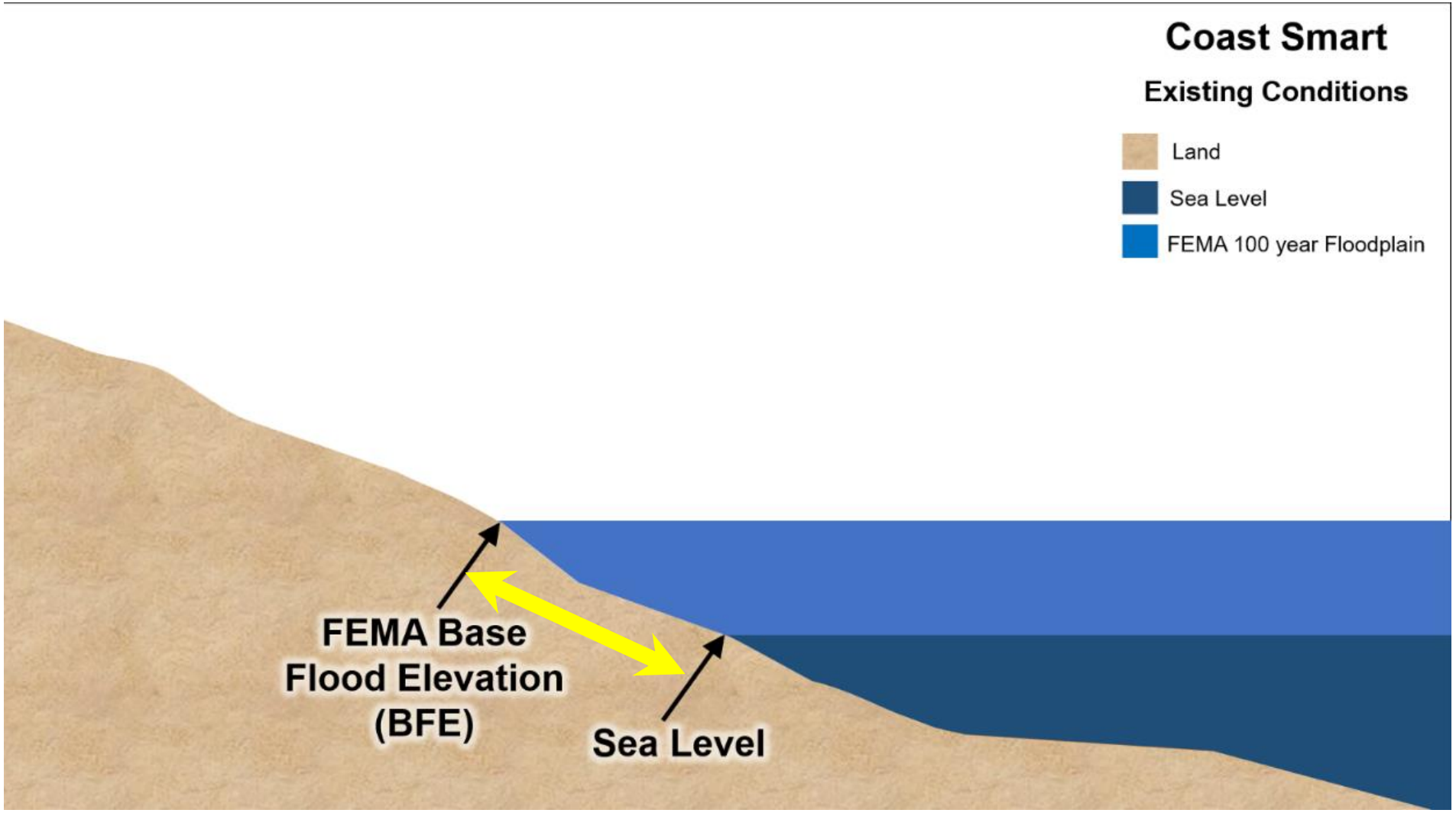
Profile View of FEMA Floodplain at Coastal Shoreline



Profile View of FEMA Floodplain and Coastal Shorelines



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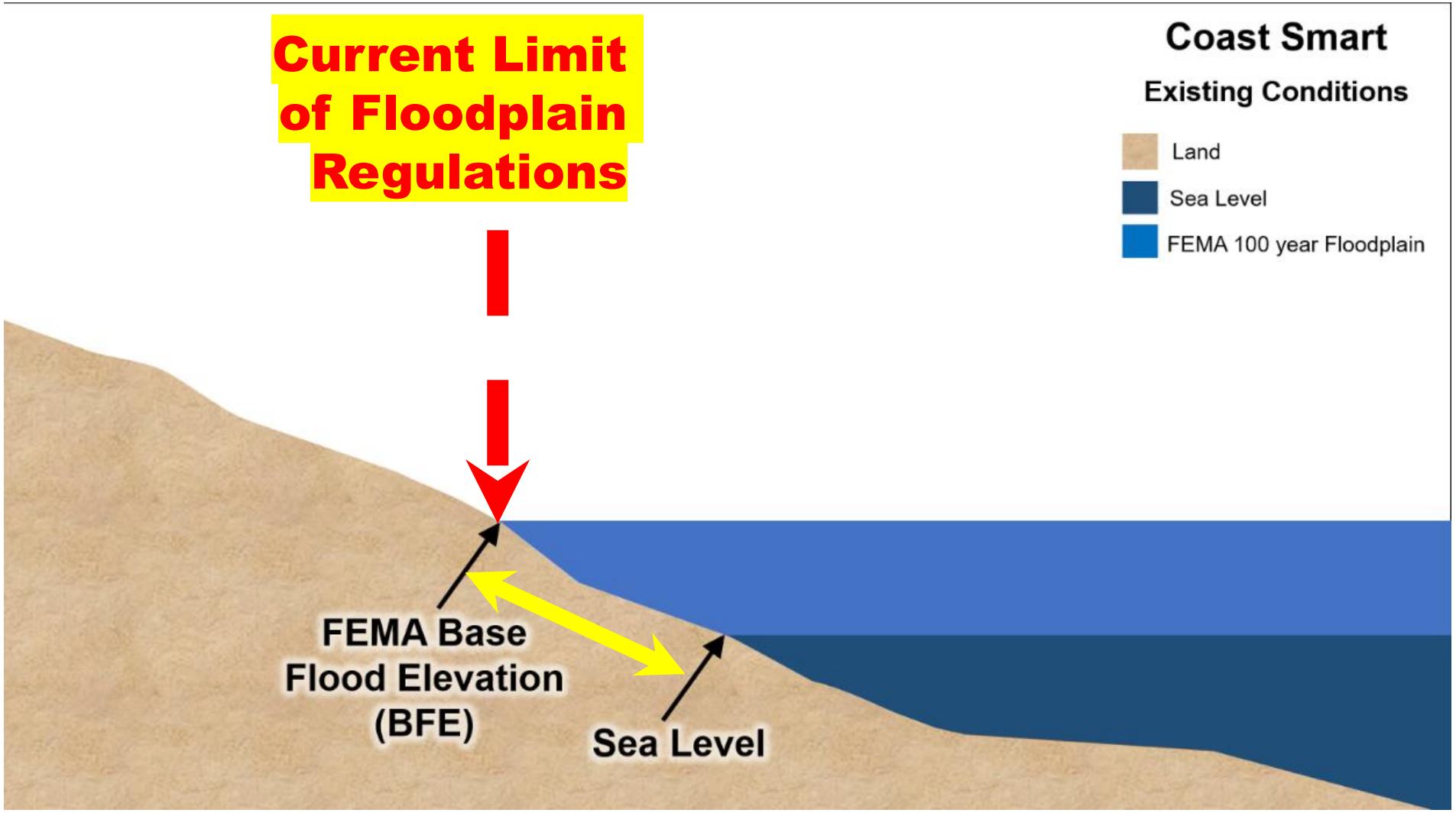
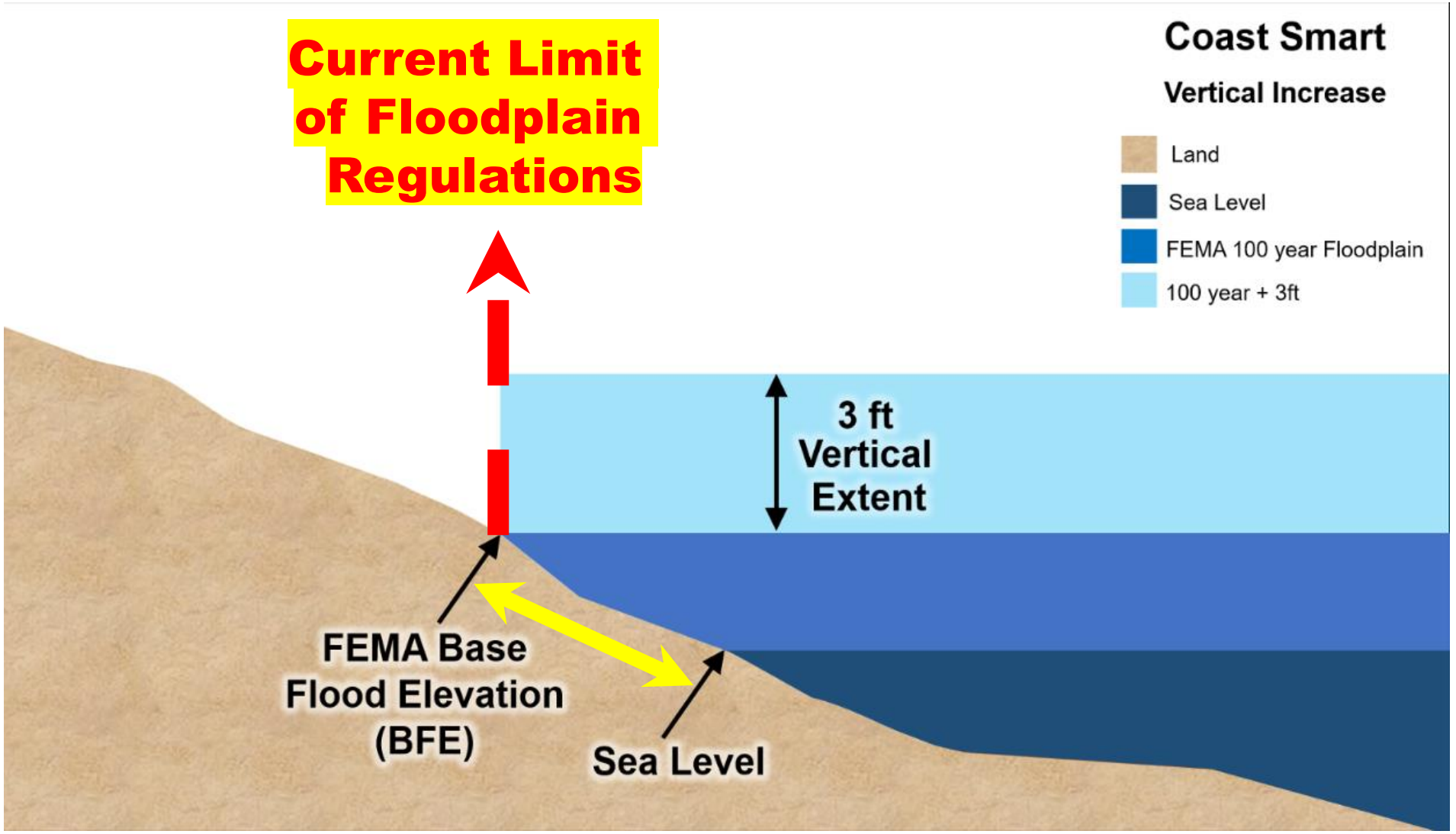
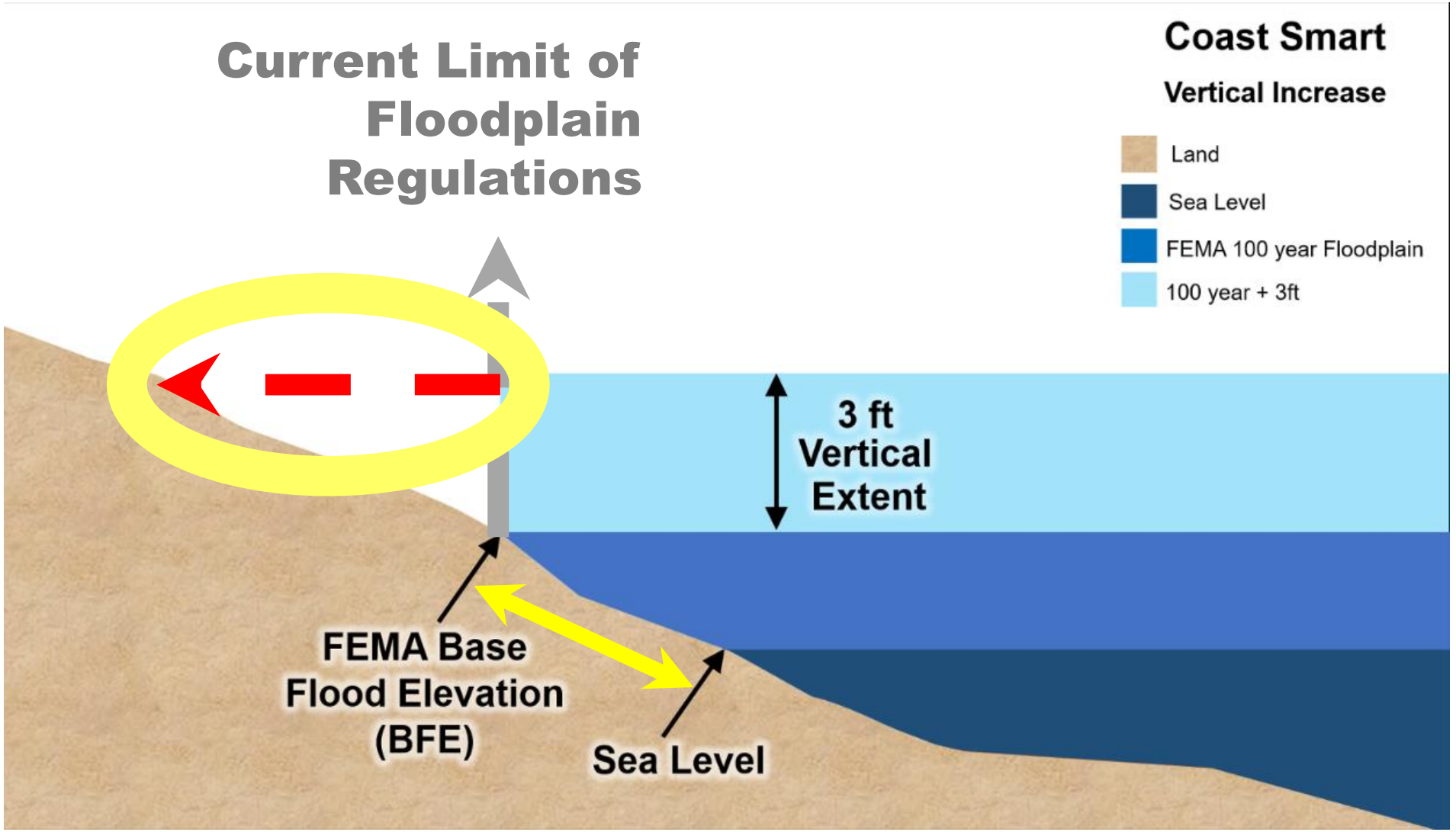


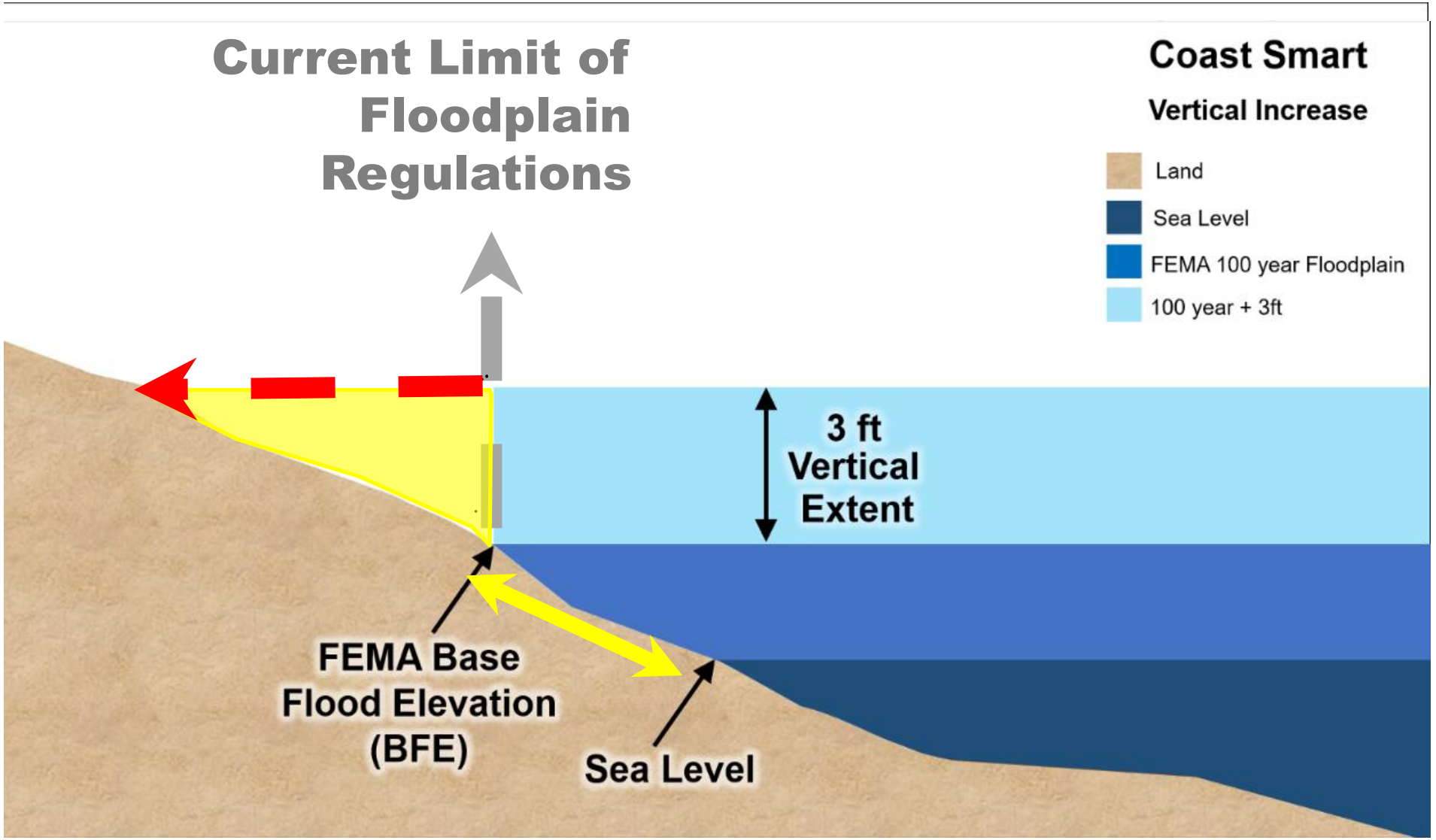
State (via CRAB) & Many Communities Apply a Freeboard of (1, 2, or 3 feet)



But, that Vertical Wall of Water doesn't Stop at the mapped FEMA Limits …



Flooding Can and Will Occur Beyond the FEMA Limits ! (in New Areas -)



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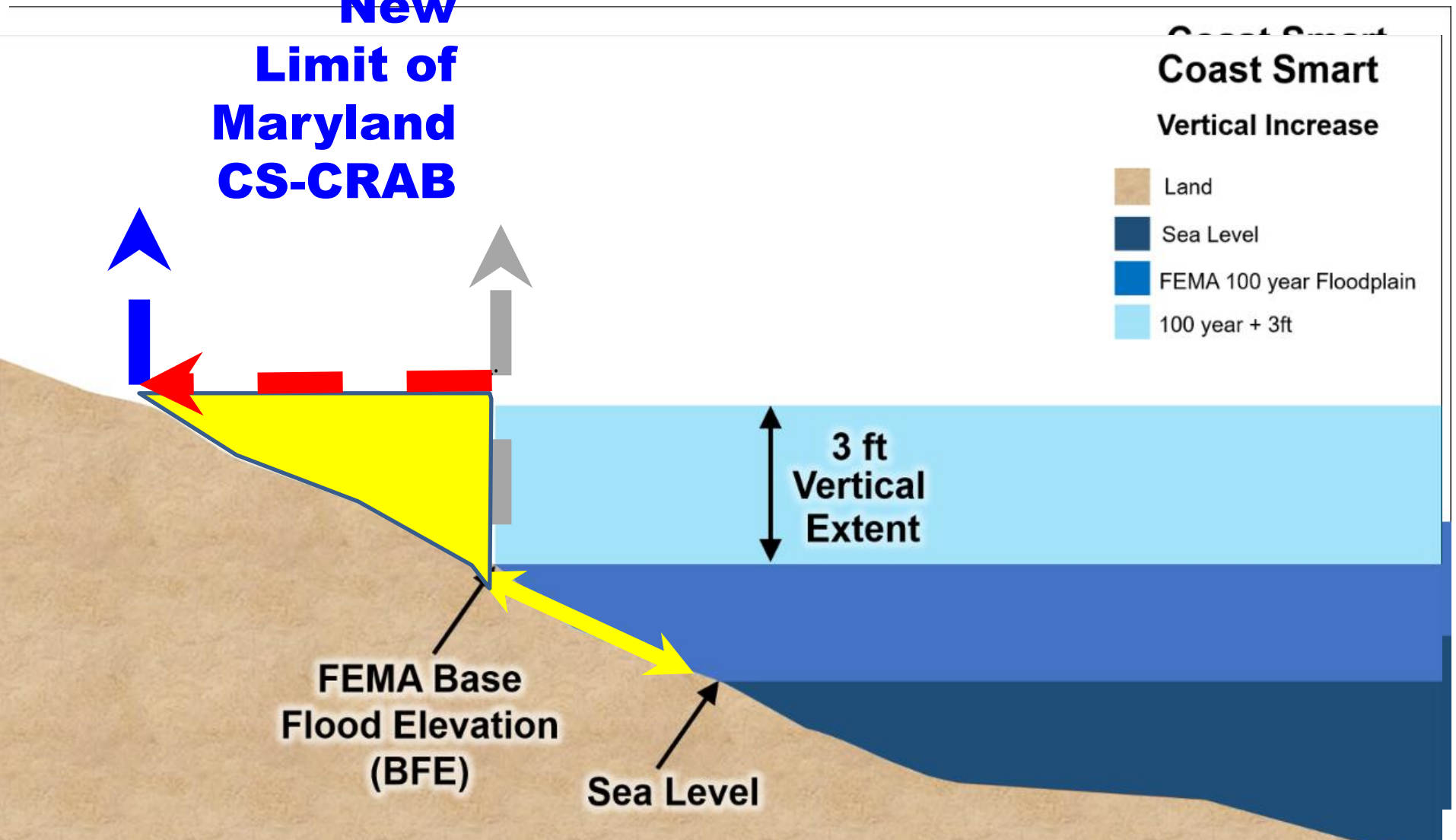

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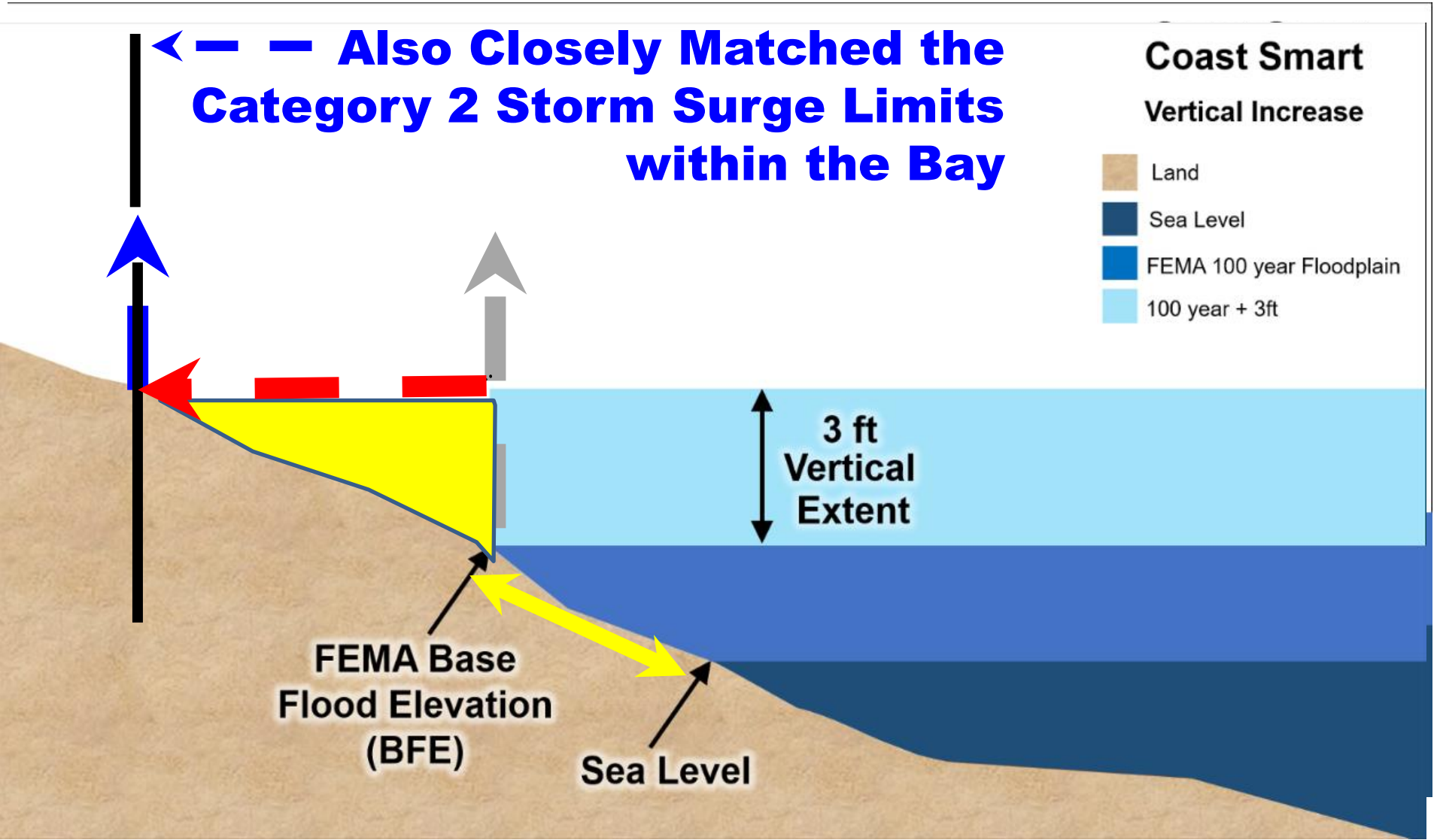
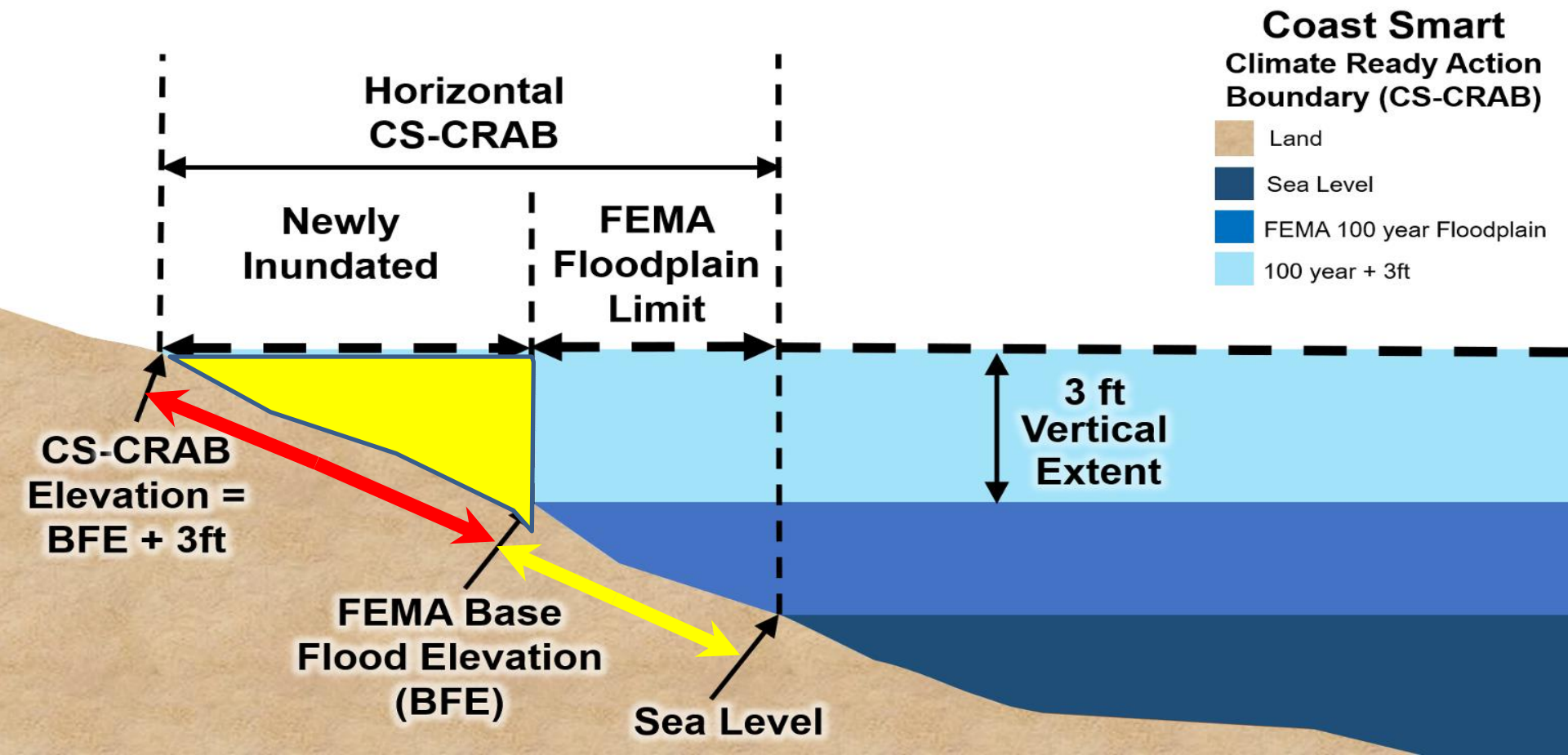
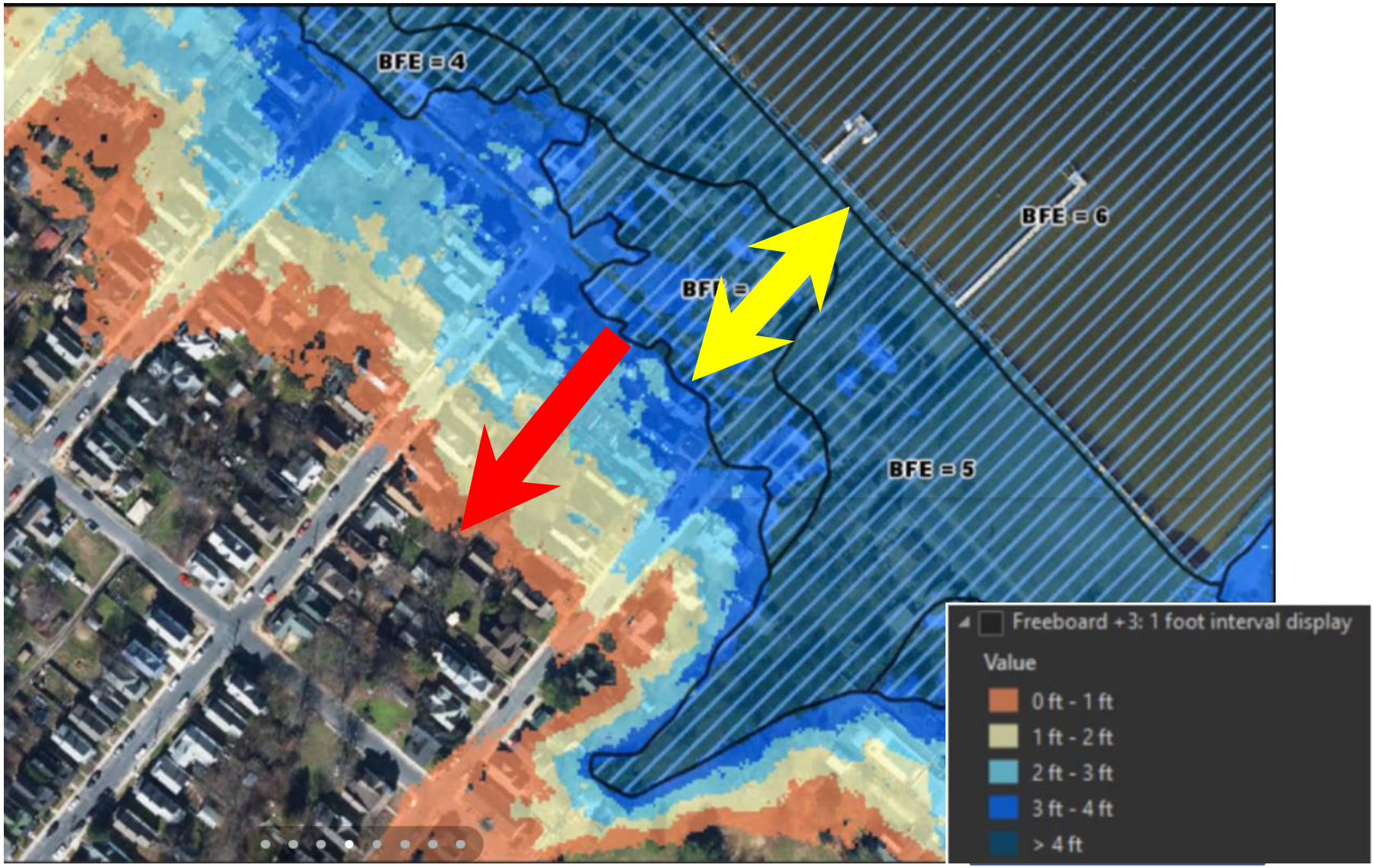


CS - CRAB: Climate Ready Action Boundary Establishes A Defined Landward Limit And An Elevation for Resiliency

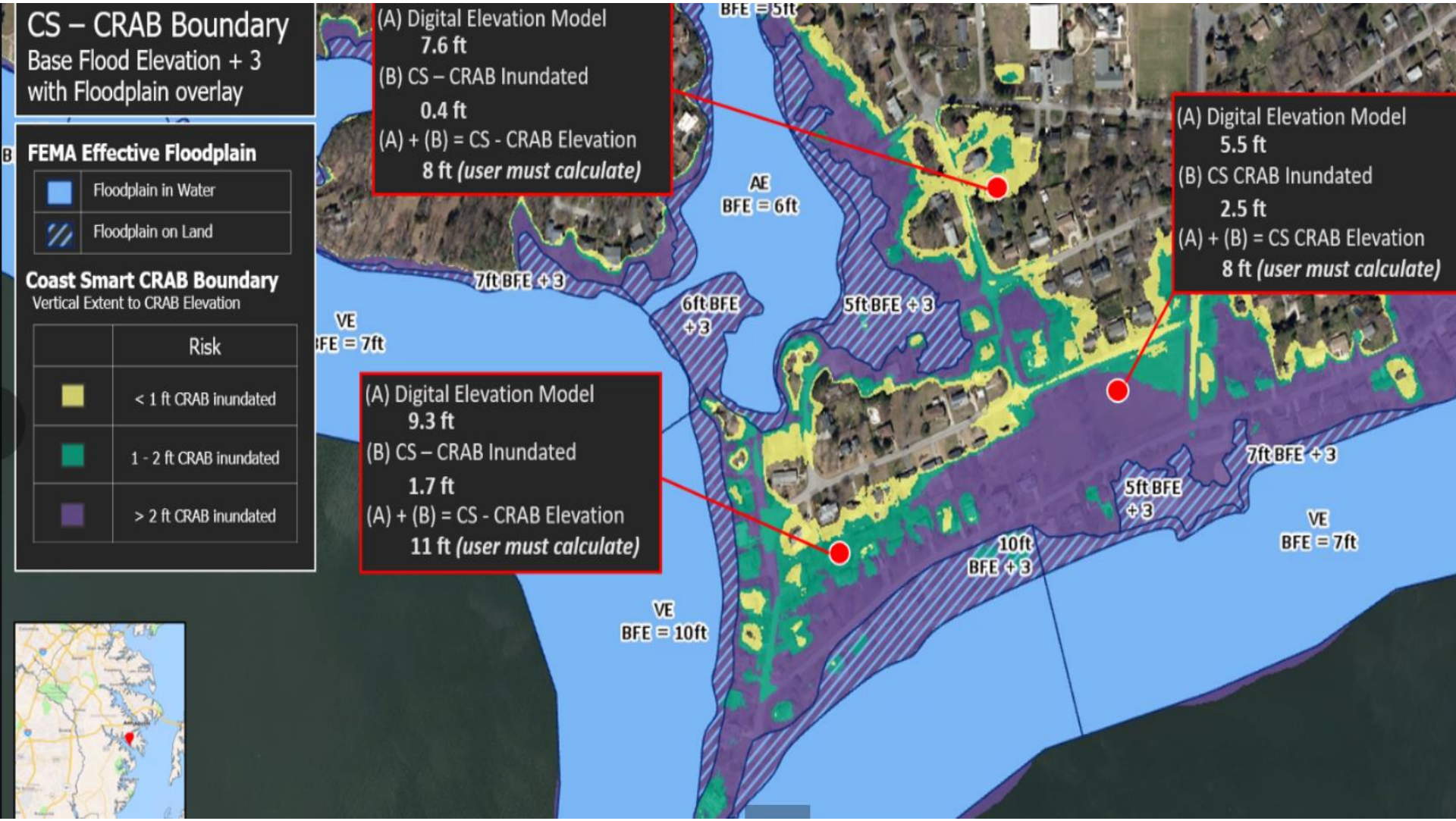


What Does the CRAB Look Like In Plan View on a Map ? …

(Production View of CRAB)



Story Map View of CRAB



Web Sites …

CRAB Web Site

https://mdfloodmaps.net/CRAB/

Floodplain Data and Models

https://mdfloodmaps.net/

Story Map

- https://storymaps.arcgis.com/stories/bd1ab6827c77457a9c6aec5ca1eb4af2

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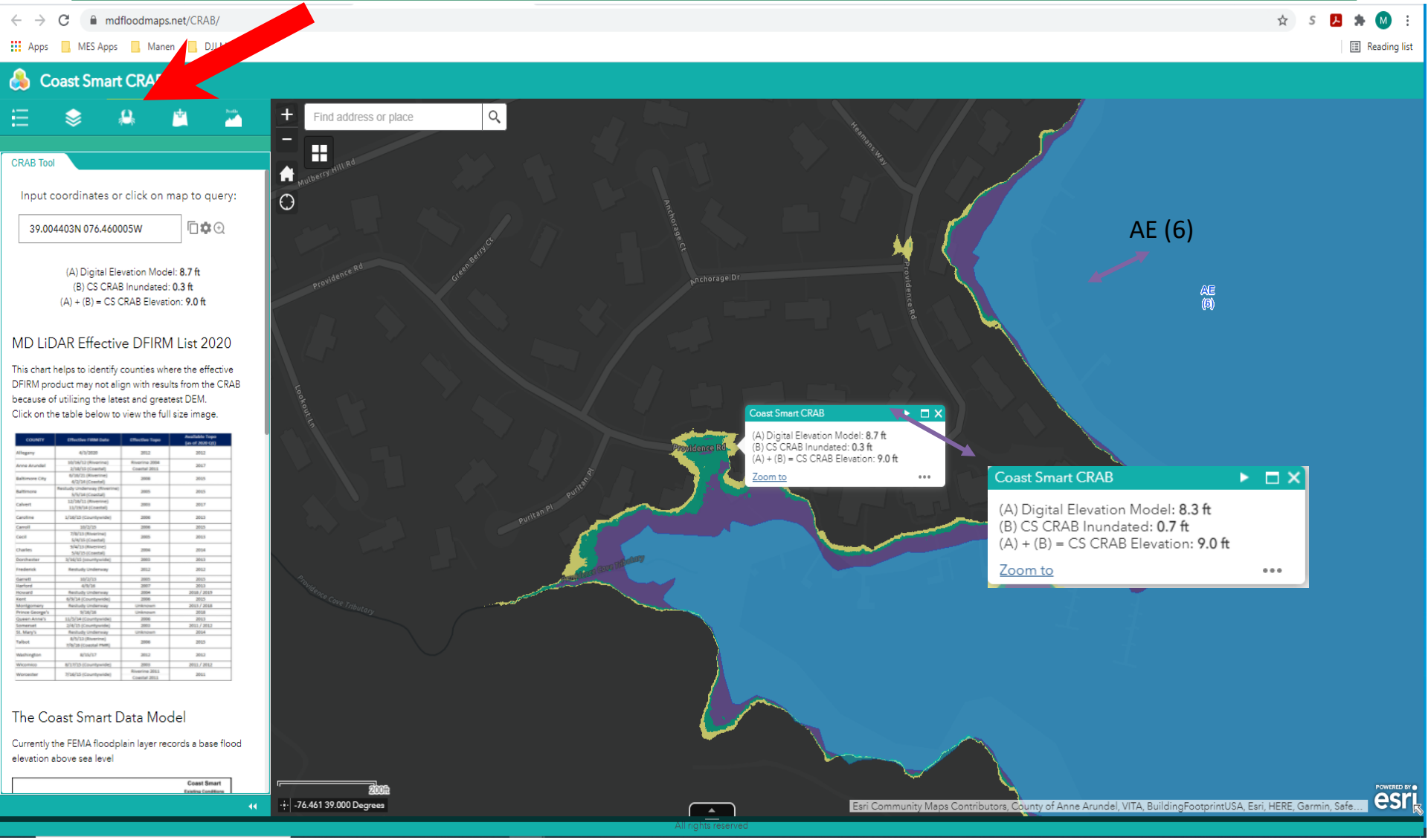
CRAB Tool https://mdfloodmaps.net/CRAB/



CRAB Tool Topo

Identifies the topo dataset used in the effective floodplain product vs best current available topo data used for CRAB development

COUNTY	Effective FIRM Date	Effective Topo	Available Topo (as of 2020 Q1)
Allegany	4/3/2020	2012	2012
Anne Arundel	10/16/12 (Riverine) 2/18/15 (Coastal)	Riverine 2004 Coastal 2011	2017
Baltimore City	6/16/21 (Riverine) 4/2/14 (Coastal)	2008	2015
Baltimore	Restudy Underway (Riverine) 5/5/14 (Coastal)	2005	2015
Calvert	12/16/11 (Riverine) 11/19/14 (Coastal)	2003	2017
Caroline	1/16/15 (Countywide)	2006	2013
Carroll	10/2/15	2006	2015
Cecil	7/8/13 (Riverine) 5/4/15 (Coastal)	2005	2013
Charles	9/4/13 (Riverine) 5/4/15 (Coastal)	2004	2014
Dorchester	3/16/15 (countywide)	2003	2013
Frederick	Restudy Underway	2012	2012
Garrett	10/2/13	2005	2015
Harford	4/9/16	2007	2013
Howard	Restudy Underway	2004	2018 / 2019
Kent	6/9/14 (Countywide)	2006	2015
Montgomery	Restudy Underway	Unknown	2013 / 2018
Prince George's	9/16/16	Unknown	2018
Queen Anne's	11/5/14 (Countywide)	2006	2013
Somerset	2/4/15 (Countywide)	2003	2011 / 2012
St. Mary's	Restudy Underway	Unknown	2014
Talbot	8/5/13 (Riverine) 7/6/16 (Coastal PMR)	2006	2015
Washington	8/15/17	2012	2012
Wicomico	8/17/15 (Countywide)	2003	2011 / 2012
Worcester	7/16/15 (Countywide)	Riverine 2011 Coastal 2011	2011

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Riverine Dataset Development

- **Currently focusing on developing Anne Arundel county dataset first**
- **Progressing to Dorchester county dataset development next**
- **Phased roll out of data products – to be hosted in CRAB tool and DOIT servers**

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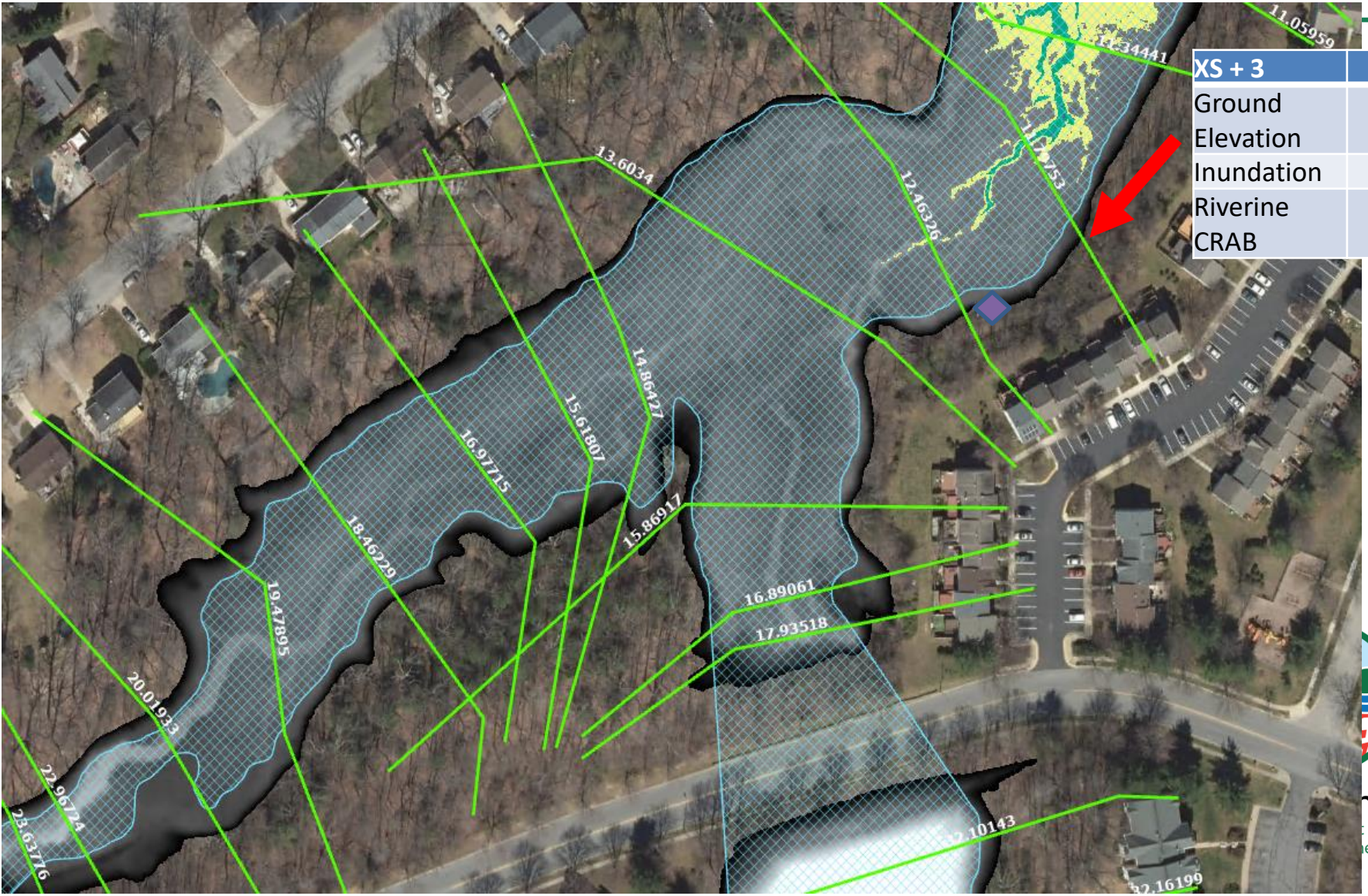
Riverine CRAB



XS + 3	14.8
Ground Elevation	13.8
Inundation	1.06
Riverine CRAB	14.86

Riverine Methodology and Validation

- **Each reach in the county is processed independently to ensure that reaches do not influence each other**
- **Riverine water surface elevation is interpolated using Inverse Distance Weighted (IDW) Interpolation – (Closer Elevation Values have a Higher Influence)**
- **Cross-sections are used as barriers to ensure that the WSE does not overrun the cross-section values**
- **Digital elevation model (DEM) is removed from the IDW surface to obtain a water depth**
- **All riverine branches are mosaiced together using the most conservative value**

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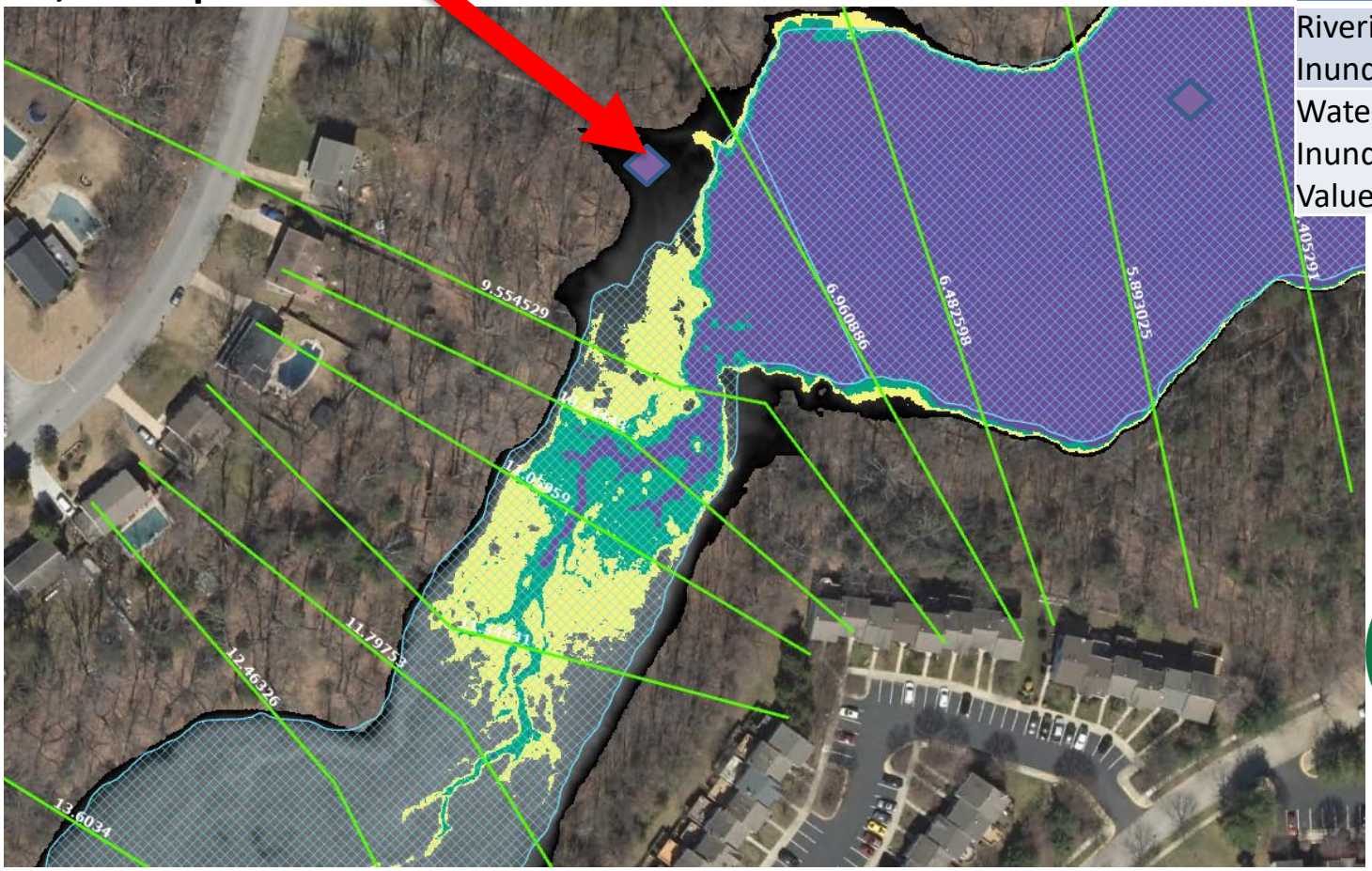
Coastal and Riverine Transition

Riverine interpolation is more conservative in this area – recommend to use these values, when possible

Coastal CRAB Inundation	7.71
Riverine CRAB Inundation	7.55
Waterfall Inundation Value'	0.16



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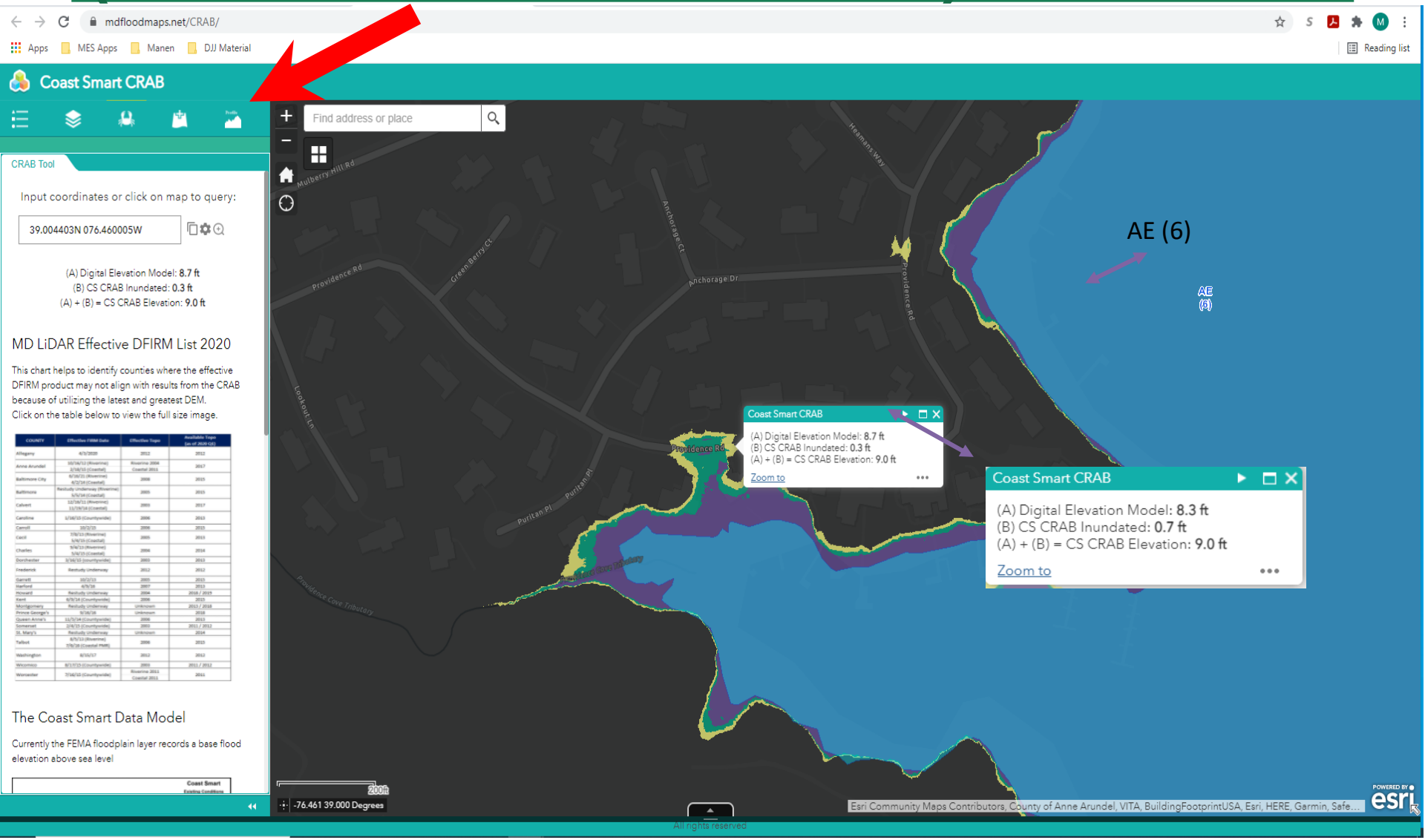
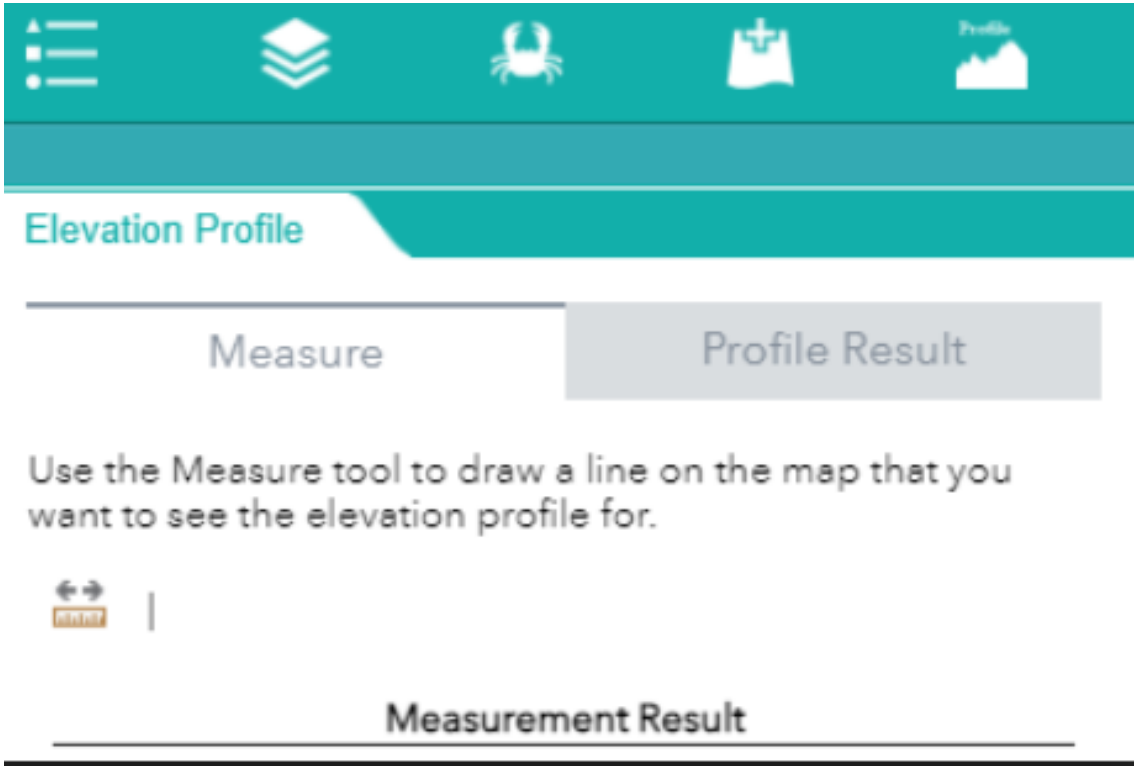
Profile or Cross-Section CRAB Tool (Works In Riverine Areas)



Live .... Or Back Up ?



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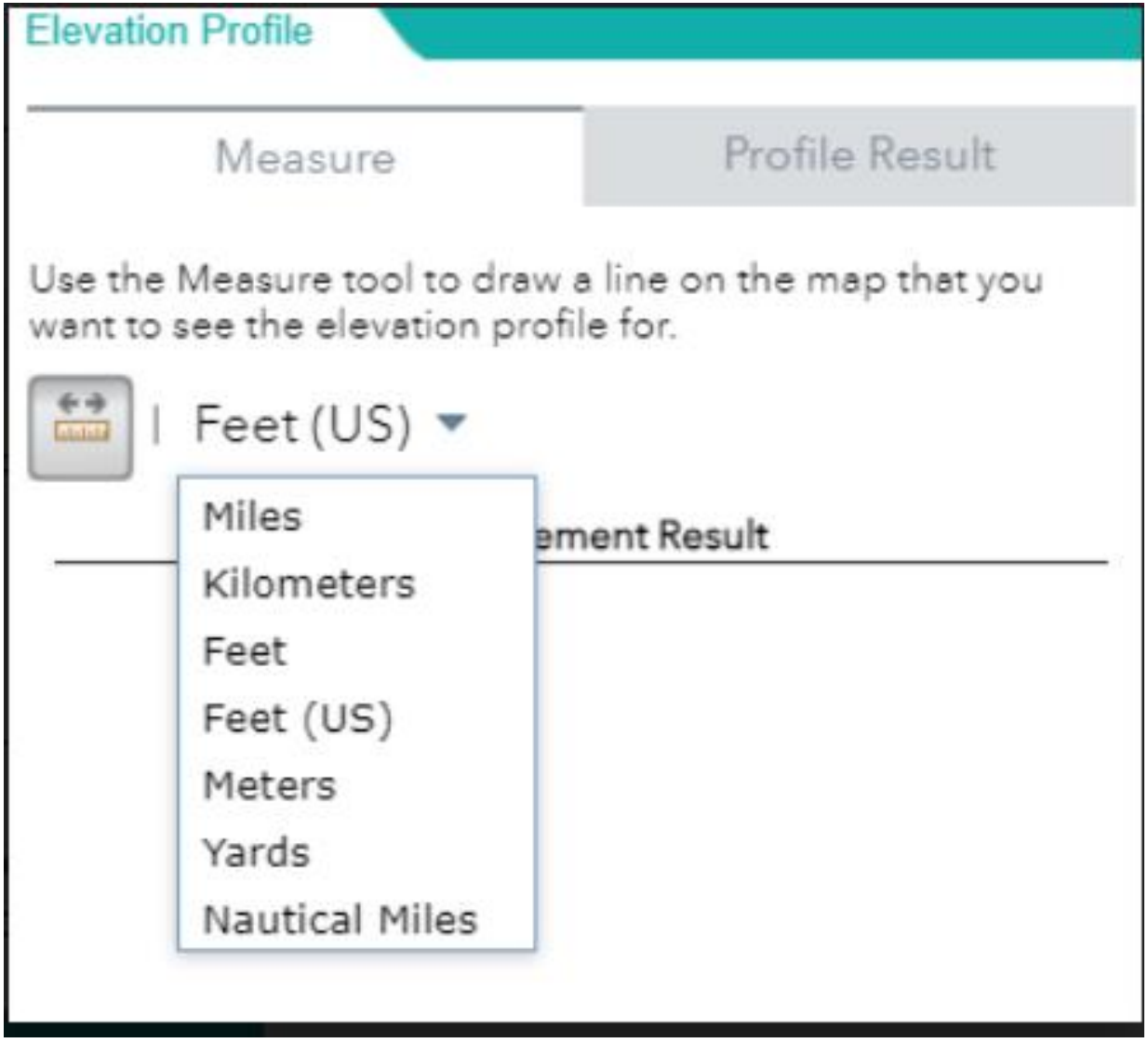

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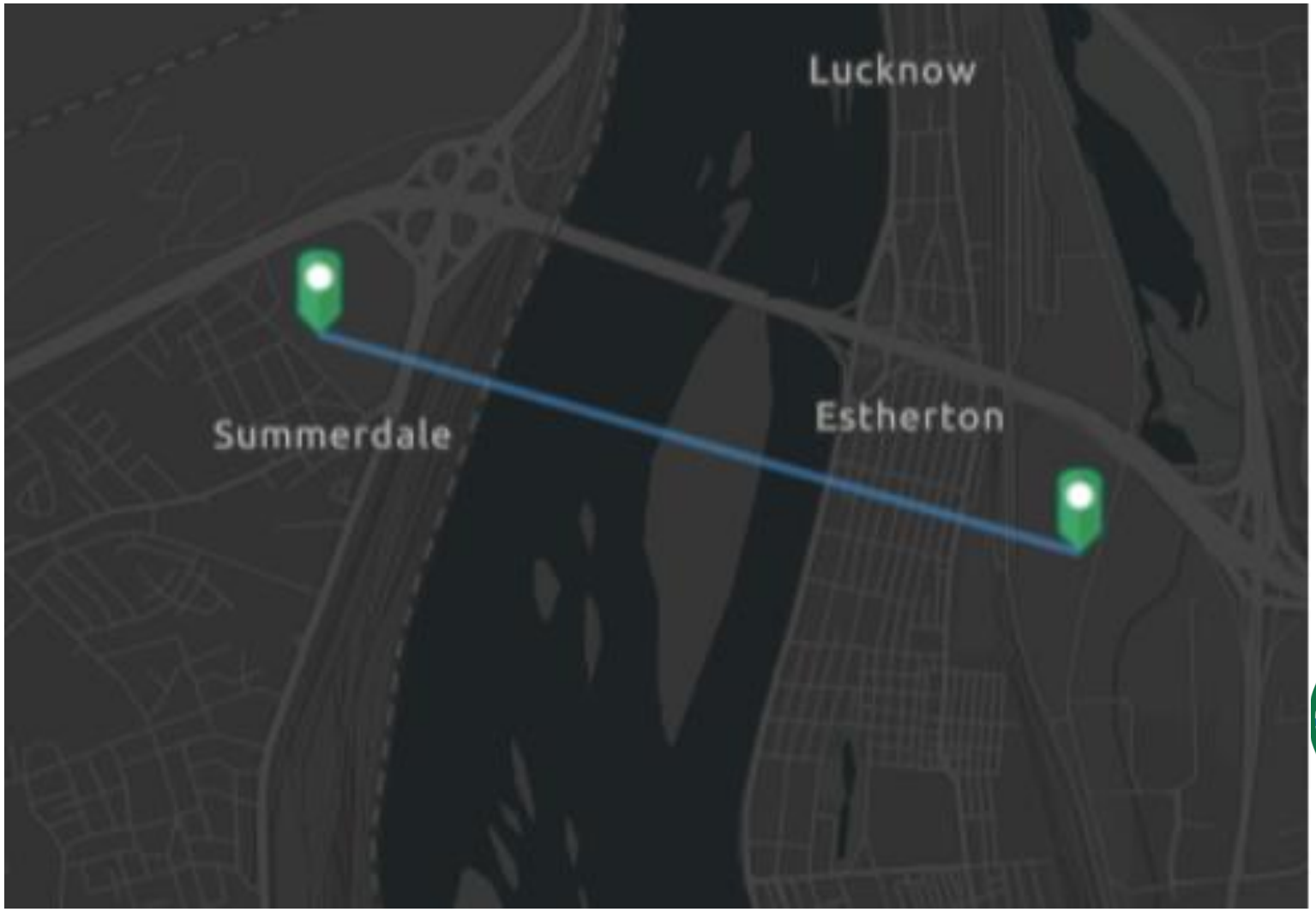
Which Side of the River is Higher ?



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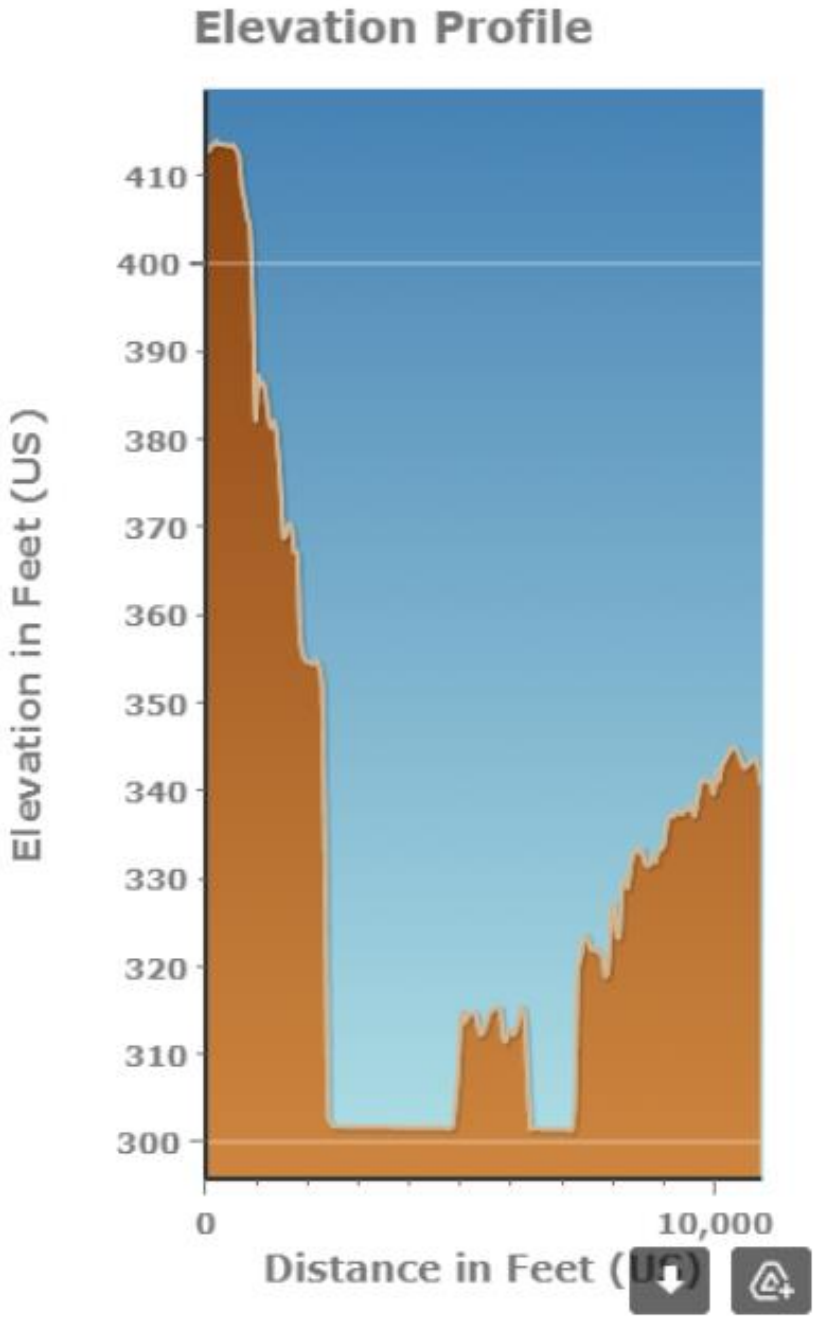

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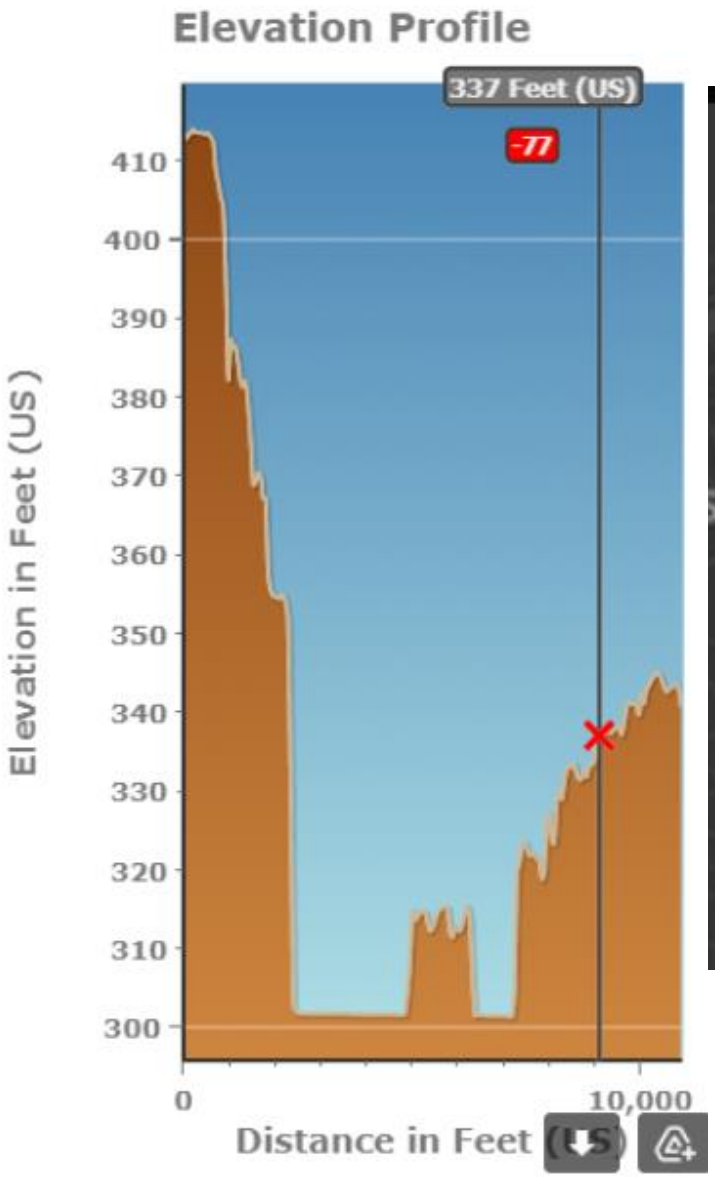

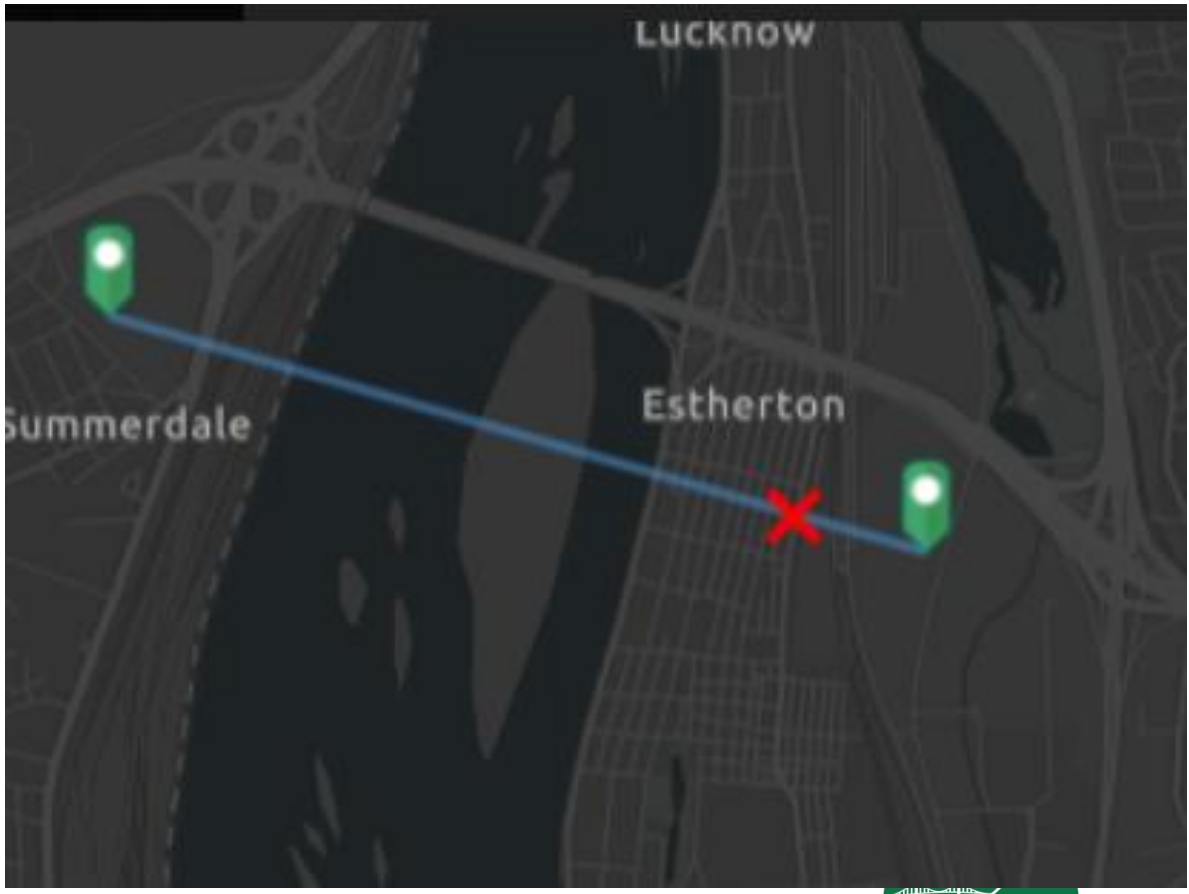

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Limitations (Not Quite Sliced Bread)

- Profile Tool Uses ESRI 20-meter DEM
- Profile Tool Is "Out of the Box" Product / No Enhancements
- Profile Tool Does Not Include Maryland's Flood Profiles (10,25,50 & 100-yr.)
- BUT – It Does Help to Understand & Convey Risk !

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Future Enhancements ???

- Profile Tool Uses ESRI 20 meter DEM – **Looking at incorporating MD DEM's**
- Profile Tool Is "Out of the Box" Product – **Looking at MD X-Sections**
- Profile Tool Does Not Include Maryland's Flood Profiles (10,25,50 & 100-yr.) **- Yet**
- BUT – It Does Help to Understand & Convey Risk ! – **Even More Def.**

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Questions / Comments /

Dave Guignet

dave.guignet @maryland.gov

Outreach Info and CRAB Tool:
mdfloodmaps.net

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