Indian River Lagoon (IRL) Basin Management Action Plans (BMAPs) Technical Meeting

March 11, 2020

Agenda

- Welcome and Opening Remarks
- Indian River Lagoon (IRL) BMAPs 2020 Updates
- Proposed Allocation Approach
- Next Steps
- Questions, Comments, Discussion

IRL BMAP Coordinators

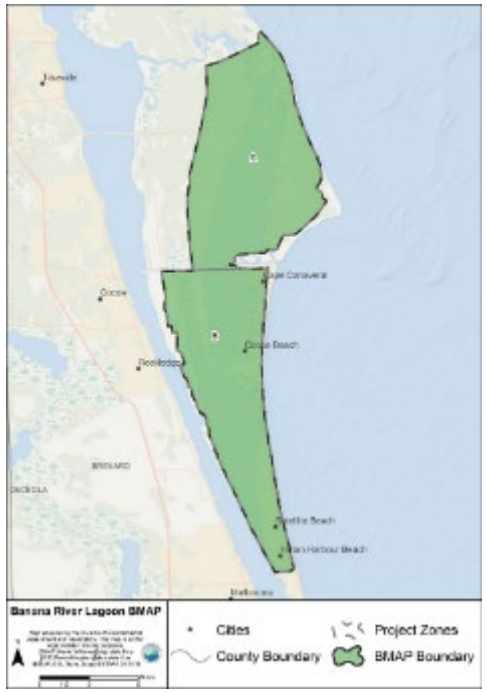
Adopted BMAP boundaries

North IRL (NIRL)

Stacy Cecil

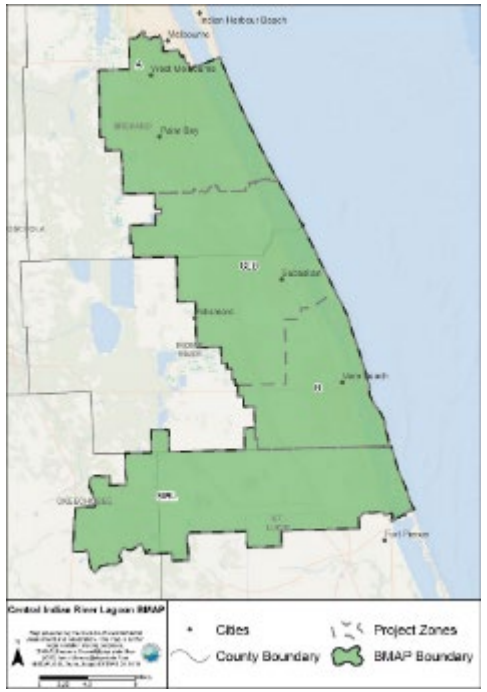
Banana River Lagoon (BRL)

Stacy Cecil



Central IRL (CIRL)

Ted Saltos



Environmental Manager

Sara Davis

Estimated 2020 Timeline

Timing is subject to change

- ✓January 15th
  - Statewide Annual Report (STAR) submittals due
- ✓February
  - Draft Allocation Calculations
- ✓March 11th
  - Public Meeting
- March - June
  - Allocation Discussions
  - New Project Collection
  - Project Reductions
- July
  - STAR Posted
  - Public Meeting (tentative)
- August - December
  - Seagrass Analysis
  - Public Meetings, As Needed
- December
  - Goal for Finalizing BMAP Updates

BMAP 2020 Updates

Modeling and Allocations

Boundary Refinements

Monitoring Network Revisions

Milestones

Components of BMAP Updates

- Modeling and Allocations
  - Spatial Watershed Iterative Loading (SWIL) Model
  - Total Maximum Daily Loads (TMDL) Percent Reductions
    - Total Nitrogen (TN) and Total Phosphorus (TP)
  - Update allocations for all entities
  - Develop allocations for BRL (A) and CIRL
- Boundary Refinement
  - Project zones → Updated segment boundaries
  - BMAP boundary
  - South Indian River Lagoon (SIRL)
- Basinwide Sources Approach
- Monitoring Network Revisions (as needed)
- Milestones

Photo Credit: Lori Morris, SJRWMD

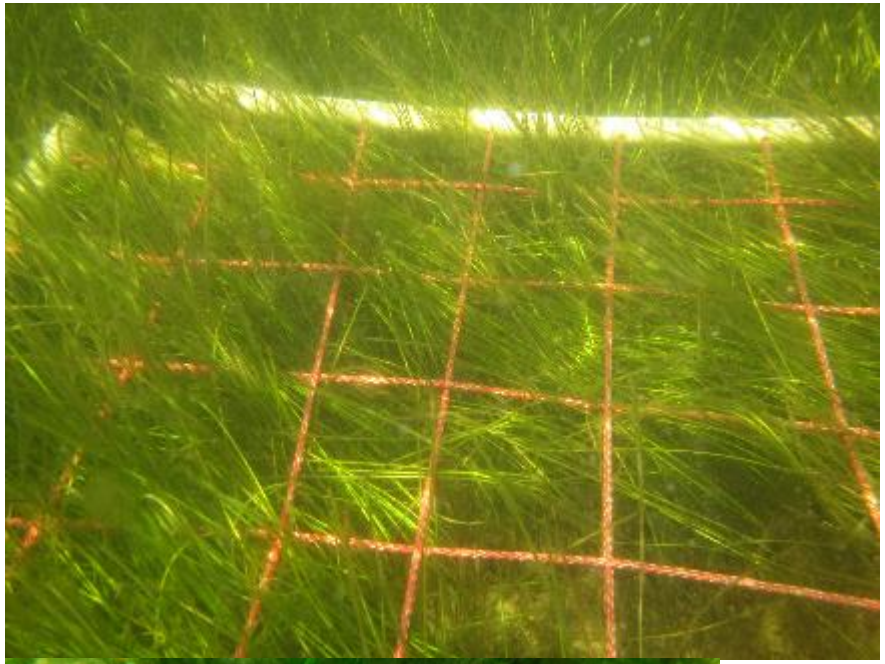


Photo Credit: Emily Rodriguez, FDEP

Modeling and Allocations

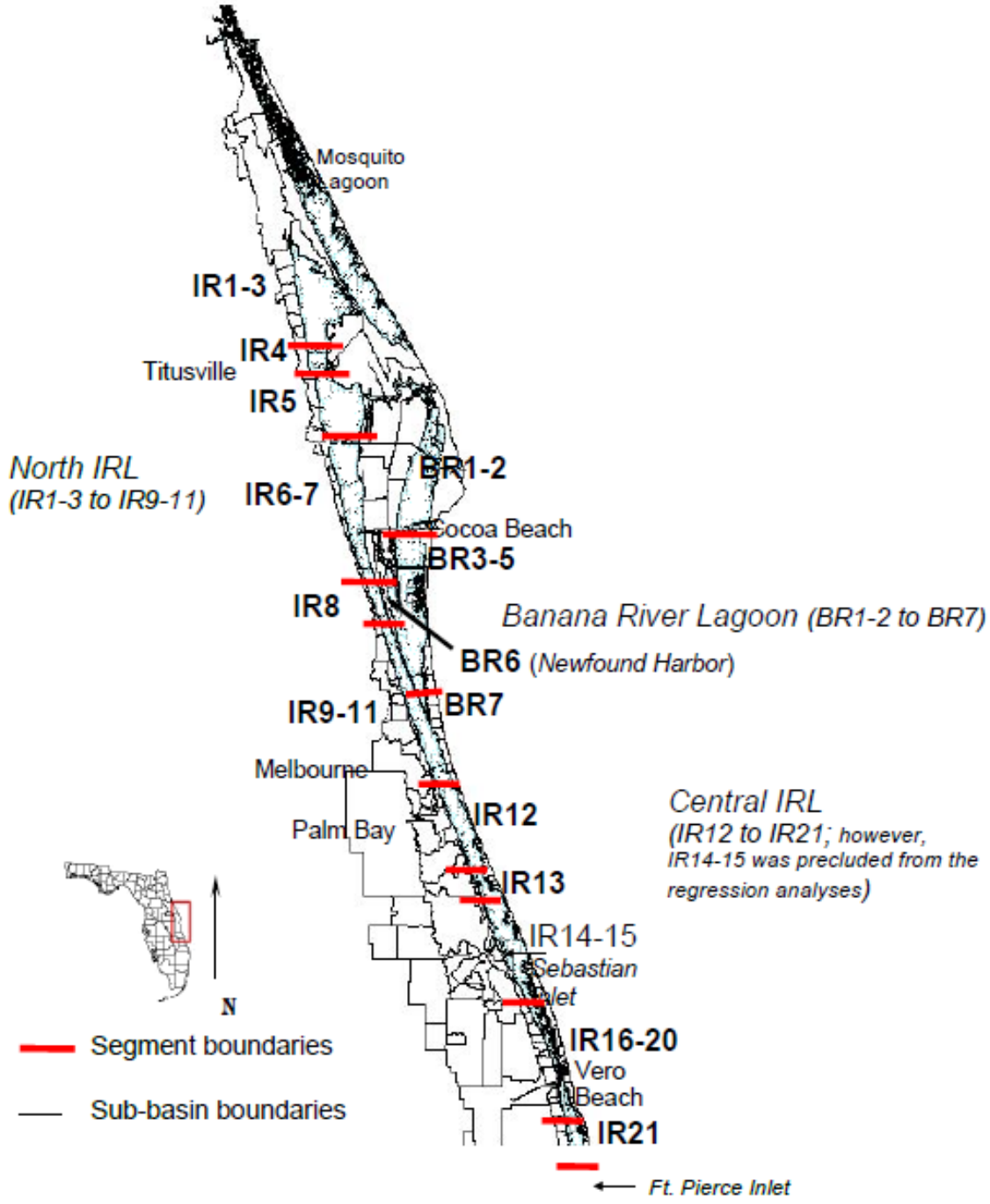
SWIL Model

- Described in Detail During the January and December 2019 Public Webinars
- Developed Under an Interlocal Agreement and a Joint Participation Agreement
- Model Purpose:
  - Provide more accurate loads both temporally and spatially, critical to building relationships to biological responses
  - Allow flexibility for future allocation in an automated fashion
- Model Specifications:
  - Python-based spatial model (Geographic Information System [GIS] platform), custom ESRI ArcGIS toolset
  - Iterative (many months at a time): originally designed to provide 16 years of monthly data
  - Initial development in 2012

Calculating Total Loads

Starting Loads and Required Reductions

- Starting Loads from SWIL Model
- TMDL Percent Reductions in 62.304.520, Florida Administrative Code (F.A.C) for Designated Areas



TMDL Reductions

62.304.520, F.A.C

BMAP	Project Zone	Segment Group	TN % Reduction	TP % Reduction
CIRL	A, SEB, B	IR12-21	56%	48%
CIRL	SIRL	IR-SouthCentral	36%	58%
NIRL	A	IR1-5	35%	47%
NIRL	B	IR6-7	36%	53%
NIRL	B	IR8-11	36%	48%
NIRL	B	IR8-11, EauGallie	51%	58%
BRL	N/A	BR1-2	67%	72%
BRL	N/A	BR3-5, BR7	59%	64%
BRL	N/A	BR6	66%	70%

Water Control Districts (WCDs)

Reminder about New Approach

Photo Credit: Patrick Bohlen, Research Gate
https://www.researchgate.net/profile/Patrick_Bohlen/publication/242470259/figure/fig6/AS:666775339429894@1535983037382/Photo-of-water-control-structure-installed-just-upstream-of-the-water-monitoring-station.png

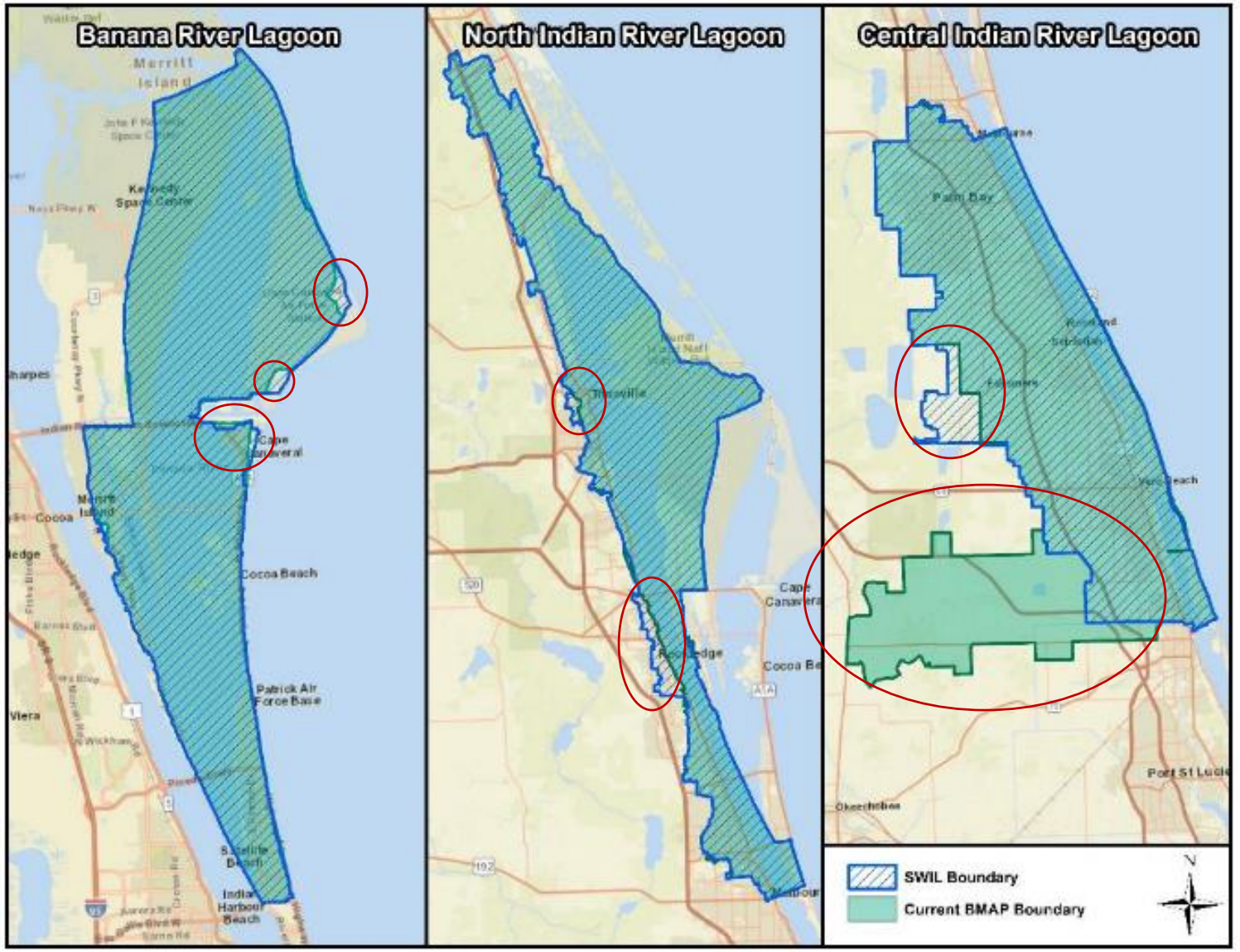
- WCDs Will Be Responsible for Reducing Loads to the IRL Based on Specific Activities
  - Will not receive a numeric allocation if committed to activity list for BMAP
- Some Required Activities Based on Land Uses Within the WCD
- Projects that Reduce Loads Can Still Be Listed (structures, etc.)
- Annual Reporting on Activity List Required

Wastewater Treatment Facilities (WWTFs)

- Revised BMAPs are Expected to Include Additional Required Reductions for Some WWTFs
- Volume and Disposal-Based Expectations
  - Surface water discharges
  - Rapid rate reuse
  - Public access and slow rate reuse
- Improvements in Treatment Levels Credited as BMAP Projects

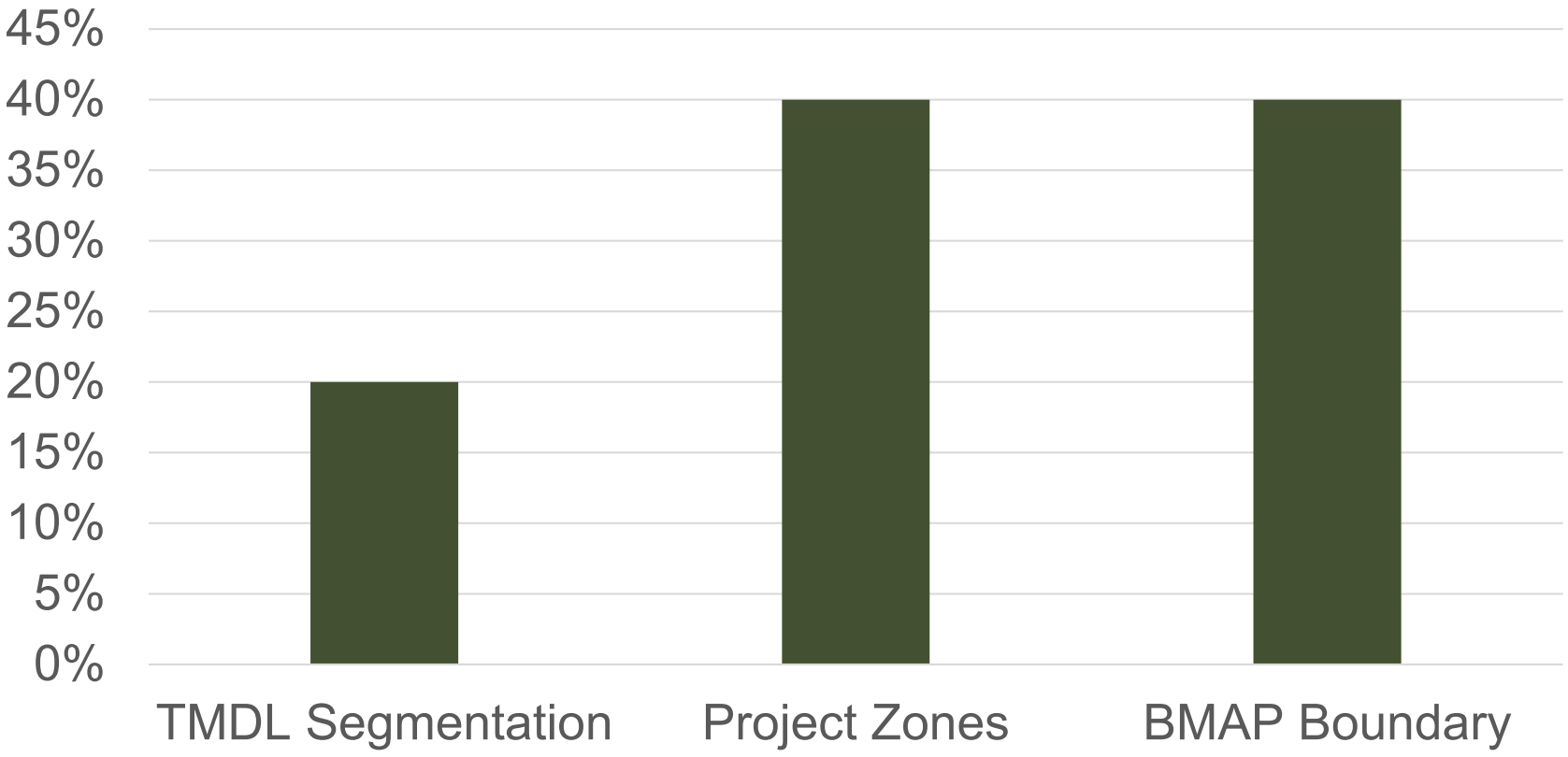
Boundary Refinements

Corrections and Alignment



Spatial Scale for Tracking Project Reductions

Stakeholder preferences based on post-webinar survey (December 2019)



Recommended Spatial Scales

NIRL → Project Zones

- Zone A
- Zone B

BRL → BMAP Boundary

CIRL → Project Zones

- Zone A
- Zone SEB
- Zone B
- Zone SIRL

Monitoring

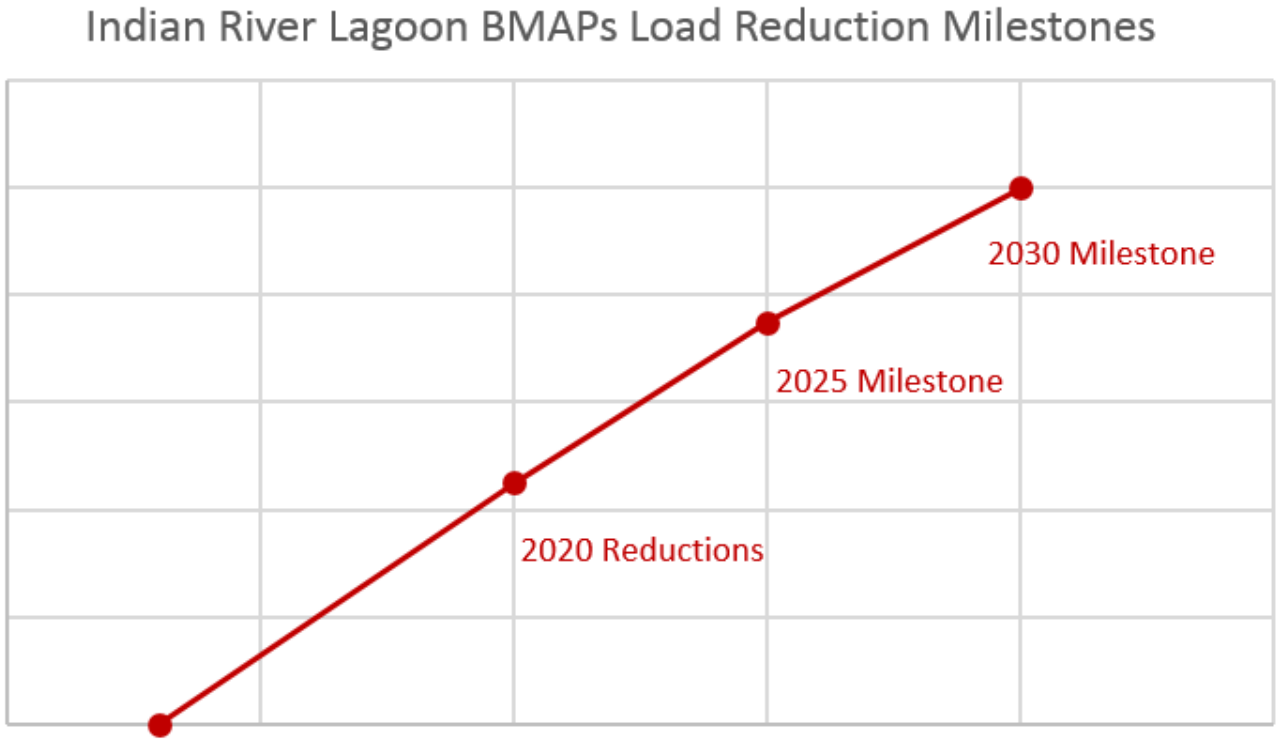
Capturing Flow, Land Use Changes, and Water Quality

- Request from post-webinar survey to review existing monitoring network, look at other available data.
- Working with St. Johns Water Management District (SJRWMD) to identify potential revisions
- Adding new data providers

Milestones

What are our 5- and 10-year goals from now?

- Current BMAPs Adopted in 2013
- BMAP Update in 2020
- 2030 Restoration Goal
- Need Milestones (% of Total Reductions) for 2025 and 2030



Questions & Comments

BMAP 2020 Updates

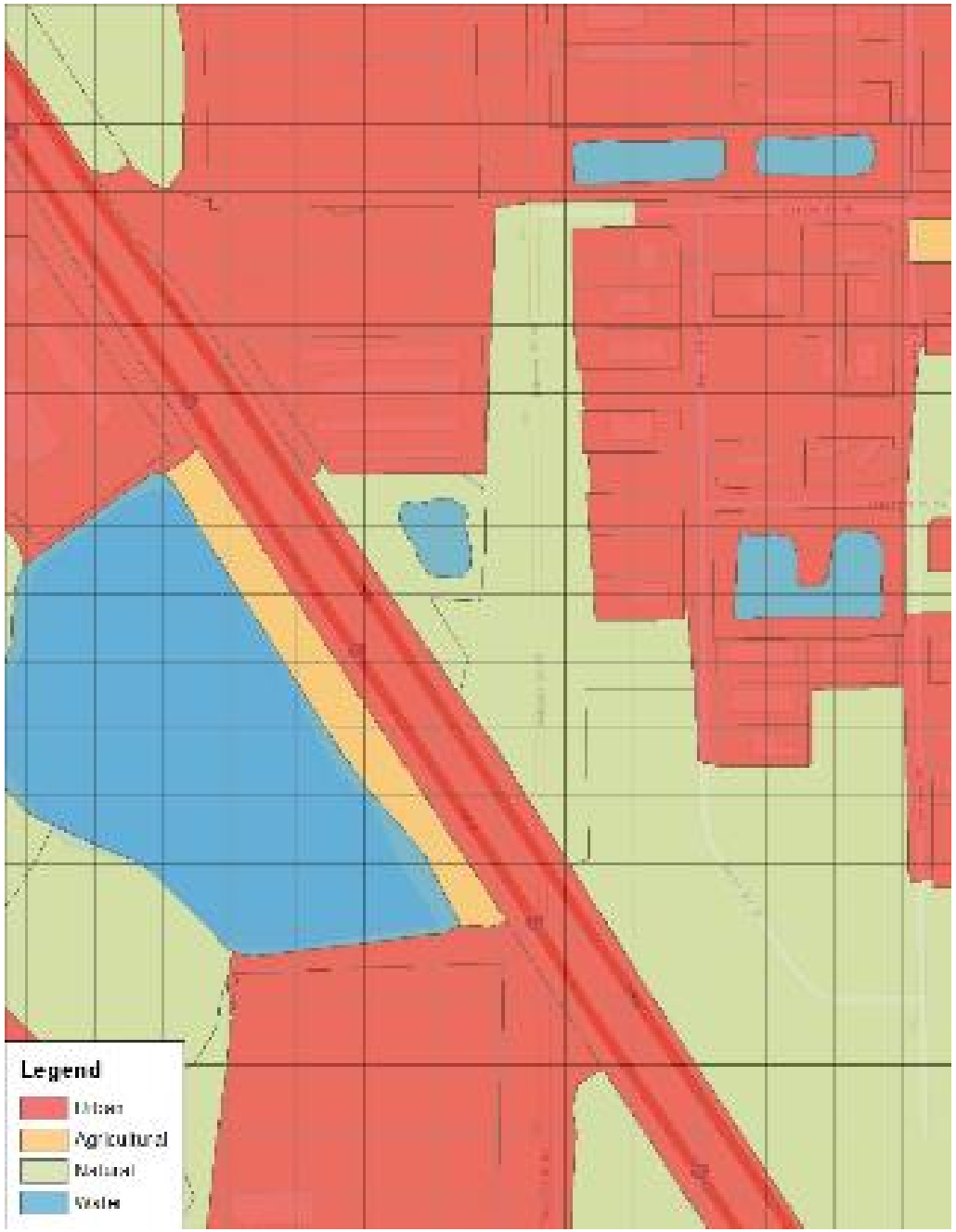
Load Estimation Tool (LET)

Project Credits

Allocation Approach

LET

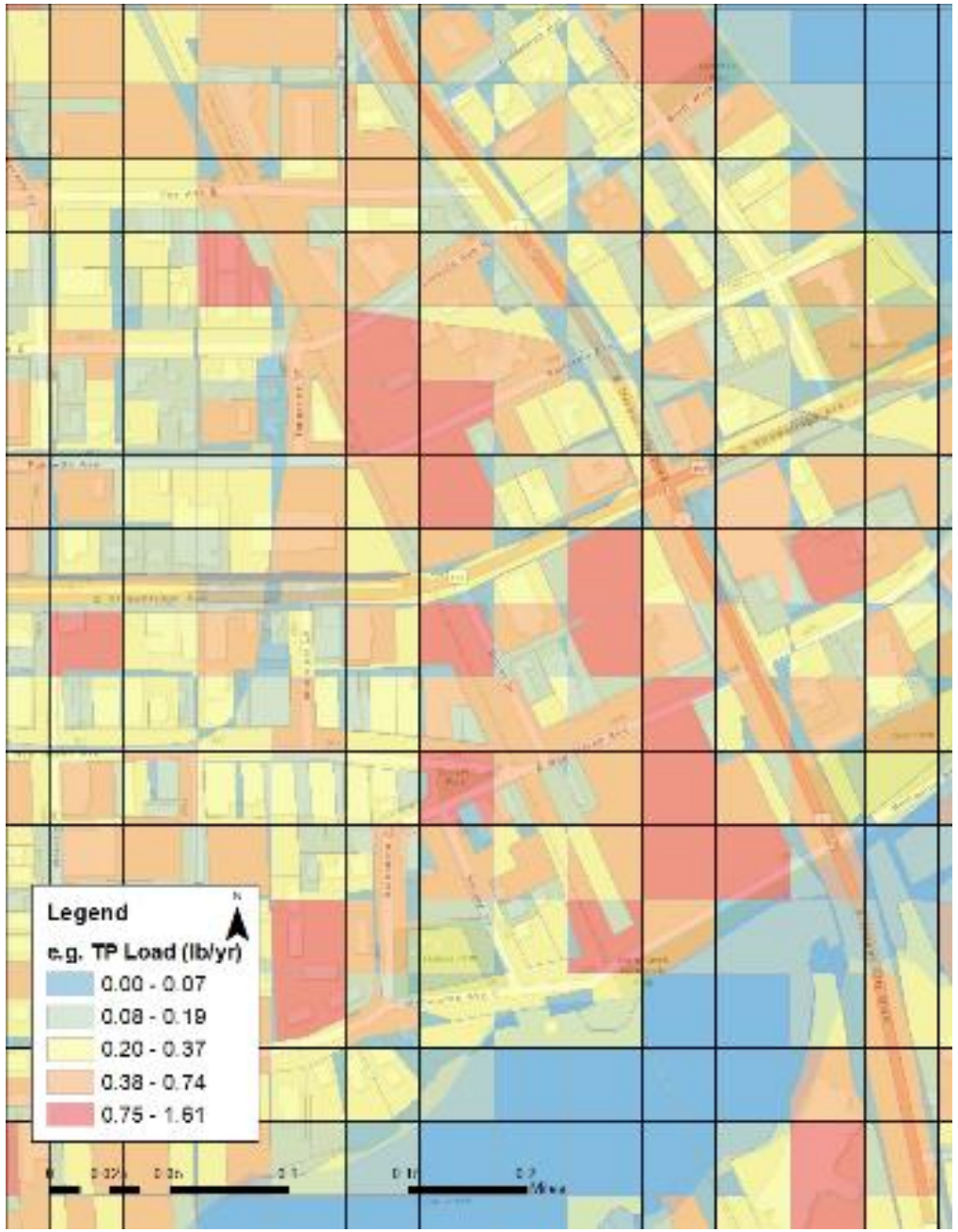
- SWIL Used 2015 Land Use
  - SJRWMD and South Florida Water Management District (SFWMD) land use
  - Property appraiser data
  - Local government natural communities land cover
  - Cape Canaveral Air Force Station and Patrick Air Force Base data
- Aggregation Using Rainfall Period of Record (POR) 2004 - 2017



LET

Created with outputs from SWIL

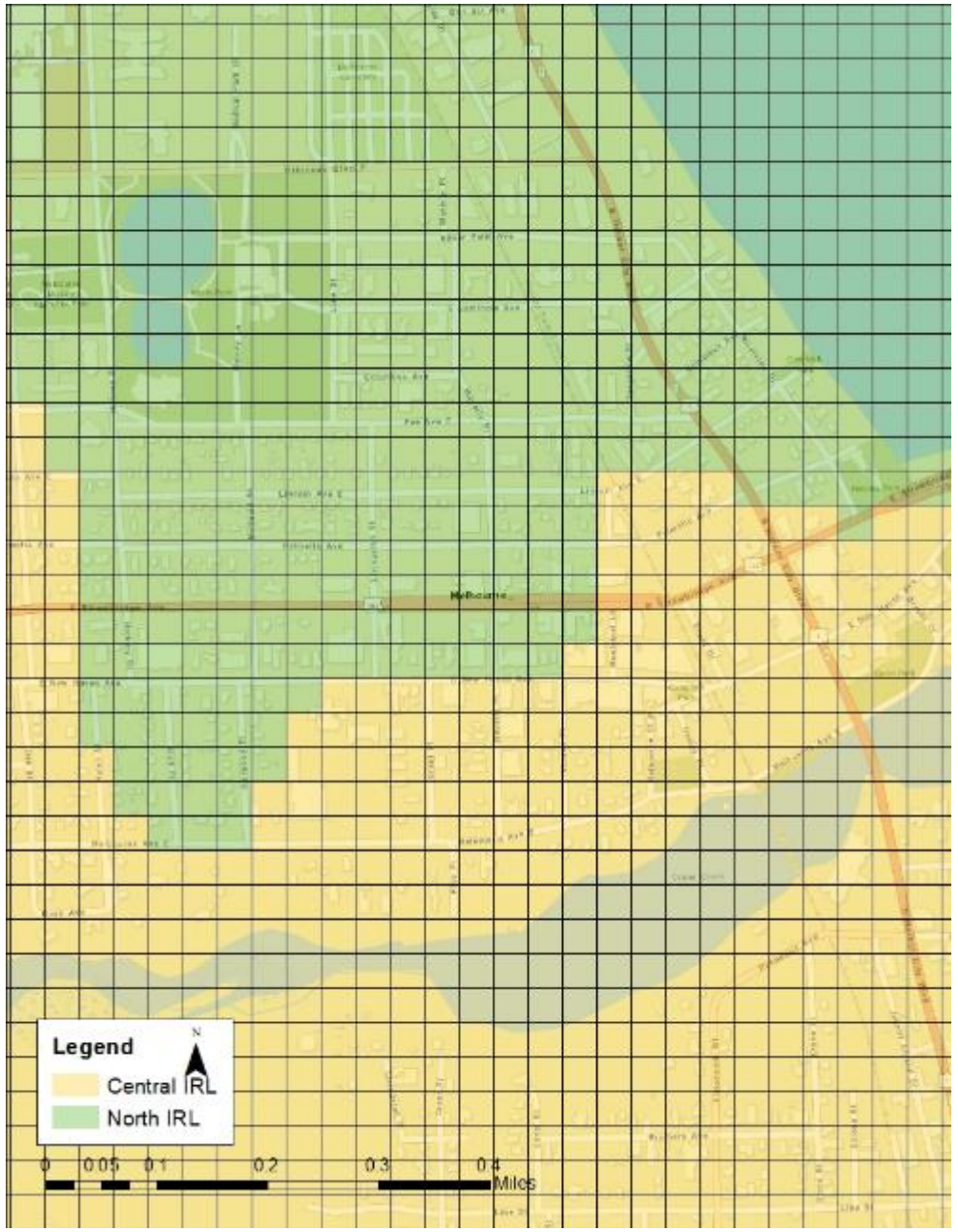
- LET Shapefile Covers All Three BMAP Areas
- 50 x 50-meter (m) Cell Size
  - higher resolution than the Pollutant Loading Screening Model (PLSM)
- Annual Outputs Included for Each Model Cell
  - Volume, TN, TP
  - Runoff and baseflow
- Combined with Land Use and Project Zone



LET

- Each Polygon Attributed With:
  - Annual totals
  - Load per unit acre per year
  - BRL, CIRL, or NIRL BMAP area

- Used for Both Allocations and Recalculation of Project Credits



Recalculating Project Credits

- Any Project Credits That Rely on Modeled Base Loads Will Be Recalculated Using Loads from the New LET
  - Education efforts, detention/retention ponds, etc.
- Verified Percent Efficiencies Will Be Used, So No New Verification is Needed
- New Projects Will Have Credits Calculated
  - Must submit sufficient supporting information to verify
- Project Credits Calculated Using Other Methods Will Not Change
  - Street sweeping, catchment basin cleanout, etc.

Project Area vs. Treatment Area

- Project Credits Are Applied to the Treatment Area (TA)
- TA Consists of the Area Where the Project will Remove Nutrients
- DEP Requests Both TA and Project Area (PA)
  - PA as a point or polygon
  - TA as a polygon
- **DEP Cannot Assume a Treatment Area from a Project Area**

*Note: the image is for example purposes only and does not reflect the TA of an actual project

Questions & Comments

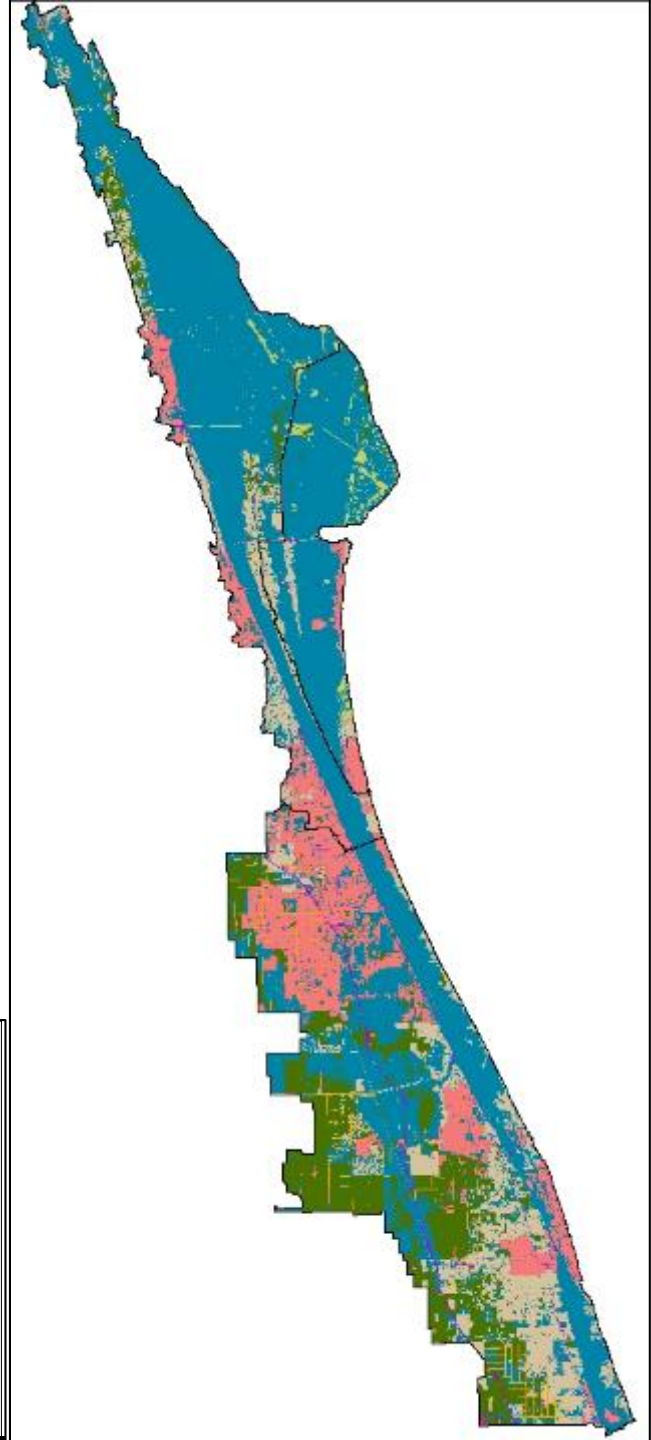
IRL Draft Allocation Entities

- Agriculture
- Federal Entities
  - Cape Canaveral Air Force Station
  - Kennedy Space Center
  - Patrick Air Force Base
- Transportation
  - Florida Dept. of Transportation (FDOT) Districts 4 and 5
  - Florida's Turnpike Enterprise
- Water Control Districts (canals, rights of way [ROWs])
  - Fellsmere WCD
  - Fort Pierce Farms WCD
  - Indian River Farms WCD
  - Melbourne-Tillman WCD
  - Vero Lakes WCD
- Municipalities
  - City of Cape Canaveral
  - City of Cocoa Beach
  - City of Cocoa
  - City of Edgewater
  - City of Fellsmere
  - City of Fort Pierce
  - City of Indian Harbour Beach
  - City of Melbourne
  - City of Oak Hill
  - City of Palm Bay
  - City of Rockledge
  - City of Satellite Beach
  - City of Sebastian
  - City of Titusville
  - City of Vero Beach
  - City of West Melbourne
  - Town of Indialantic
  - Town of Indian River Shores
  - Town of Malabar
  - Town of Melbourne Beach
  - Town of Melbourne Village
  - Town of Orchid
  - Town of Palm Shores
  - Town of St. Lucie Village
- Special
  - Port Canaveral
  - Sebastian River Improvement District
- Counties
  - Brevard
  - Indian River
  - St. Lucie
  - Volusia

Allocation Approach

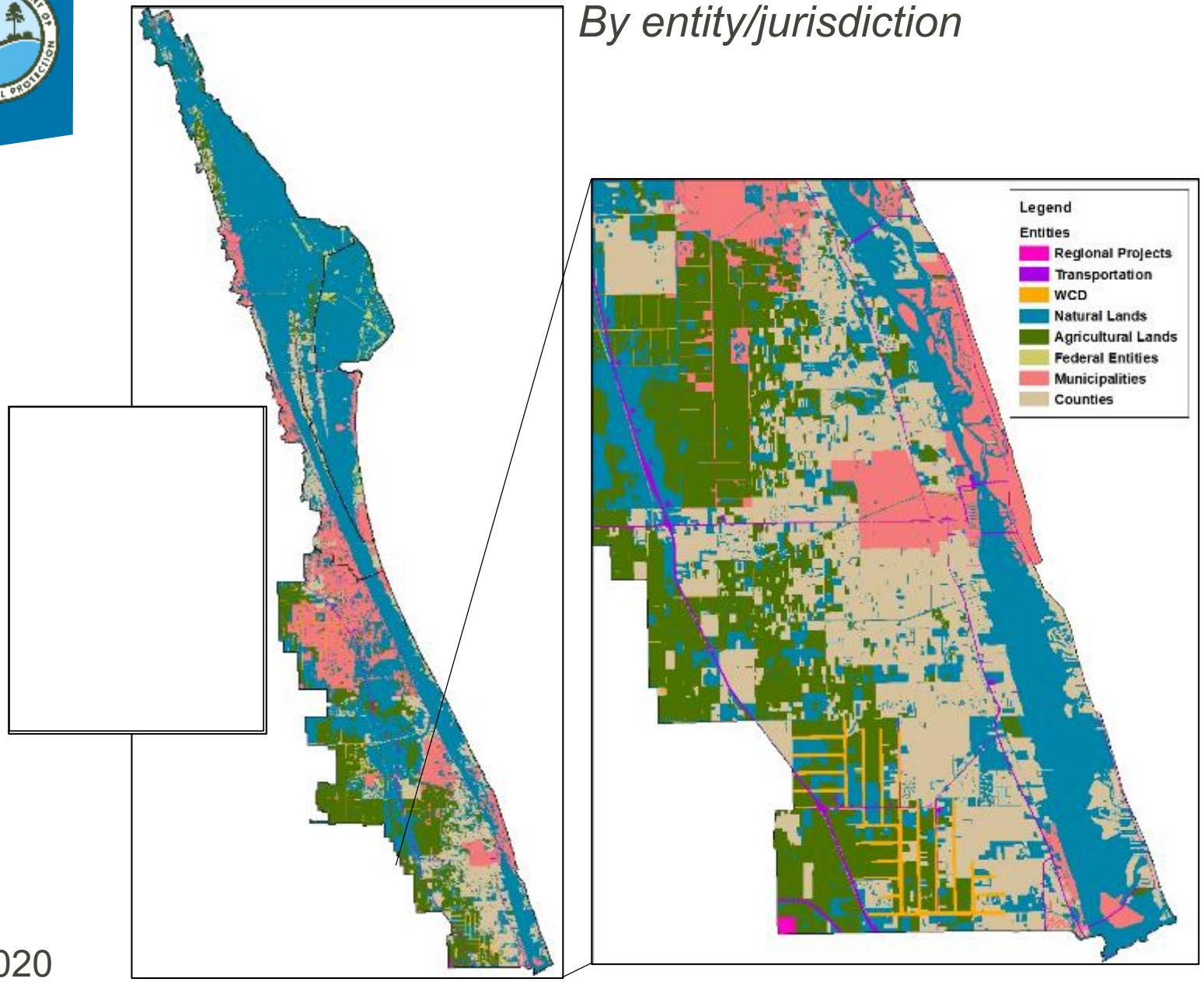
By entity/jurisdiction

- Use SWIL LET Shapefile to Determine Each Entity's Responsible Areas by BMAP, Project Zone, and/or Segment Group
- Individual Entity Shapefiles Will Be Created by Identifying Areas Sequentially
- *Refer to Handout for List of Steps*



Allocation Approach

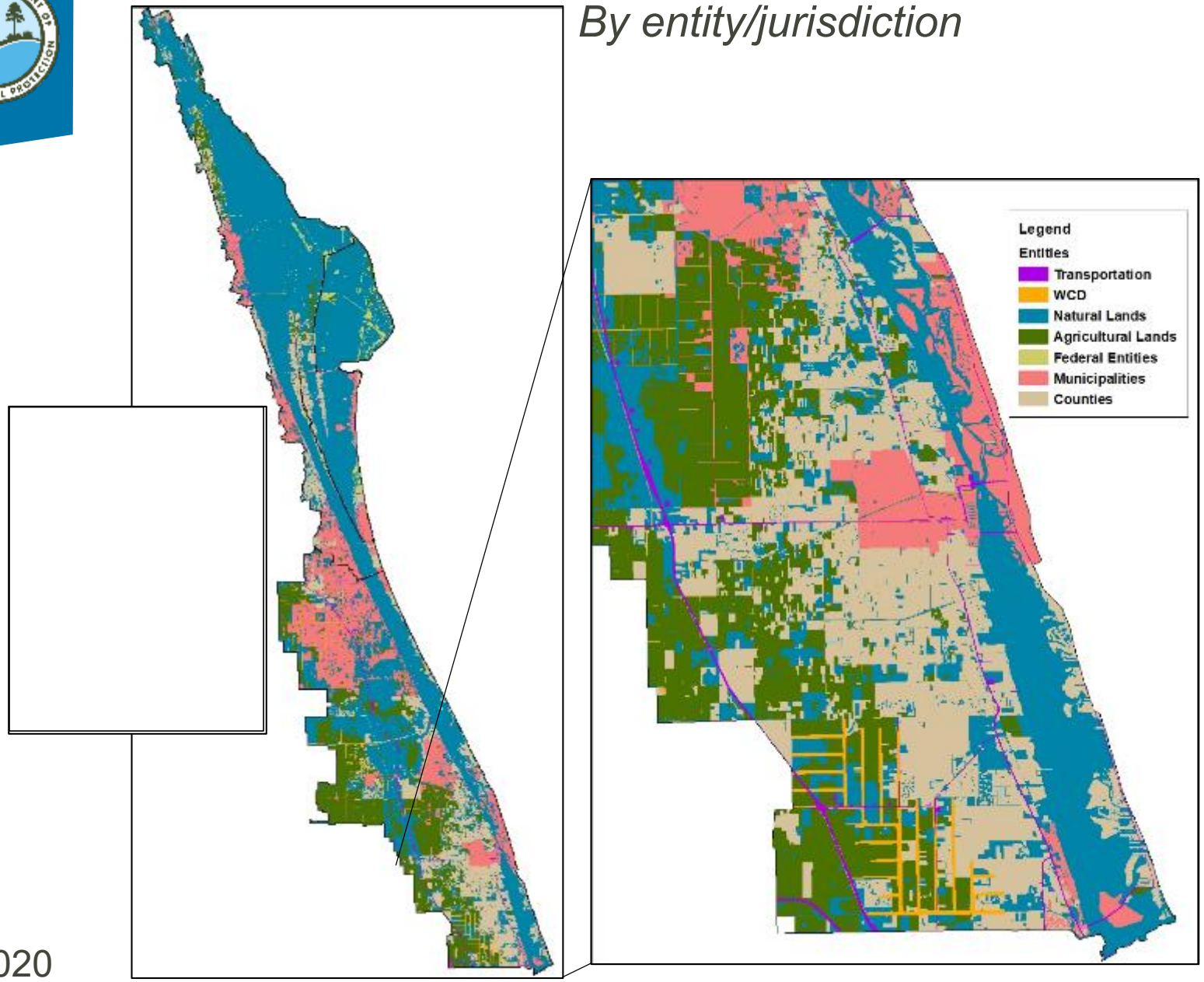
By entity/jurisdiction



1. Identify, Remove Regional Project Areas

Allocation Approach

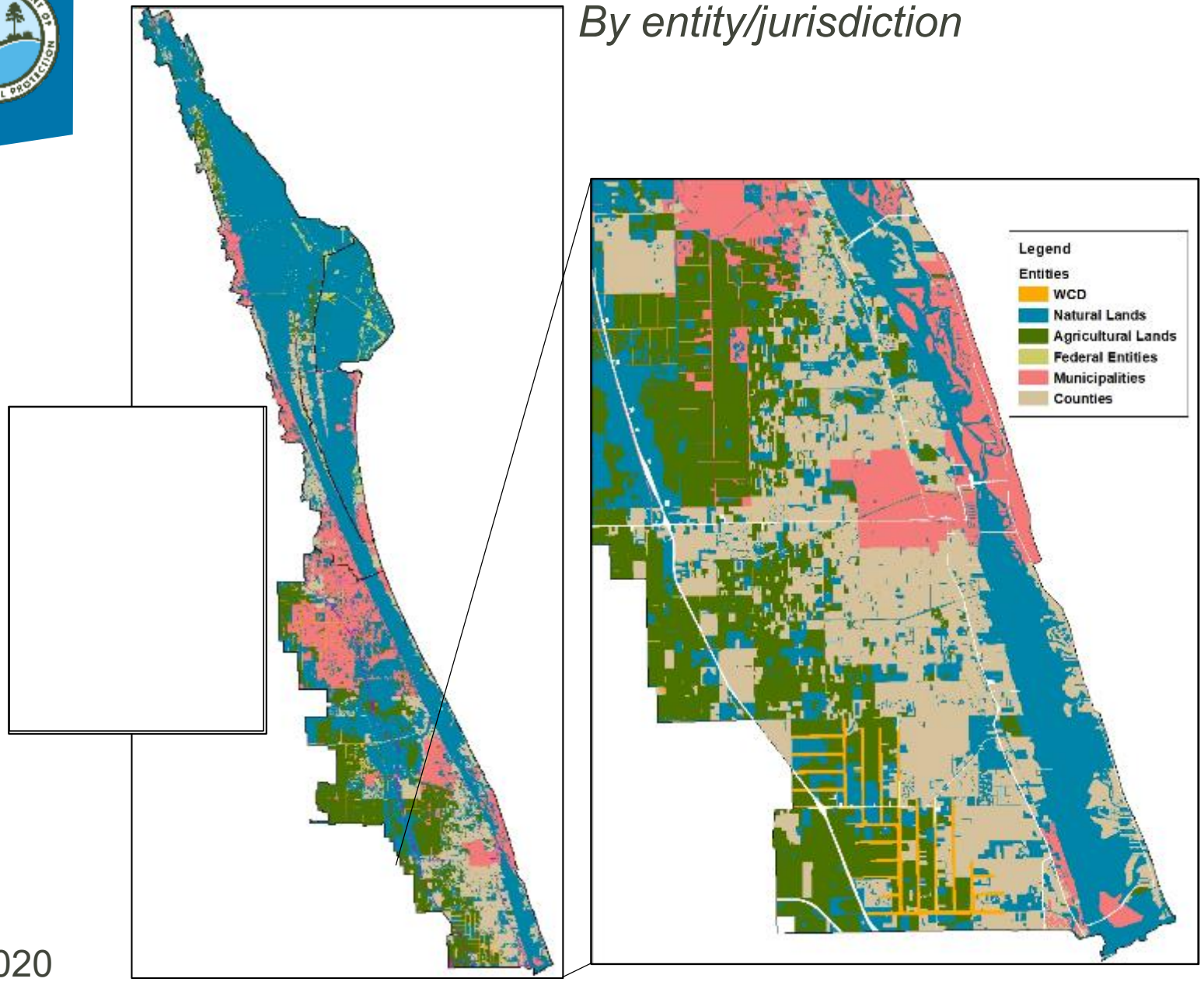
By entity/jurisdiction



1. Identify, Remove Regional Project Areas
2. Identify, Allocate, Remove Transportation ROW

Allocation Approach

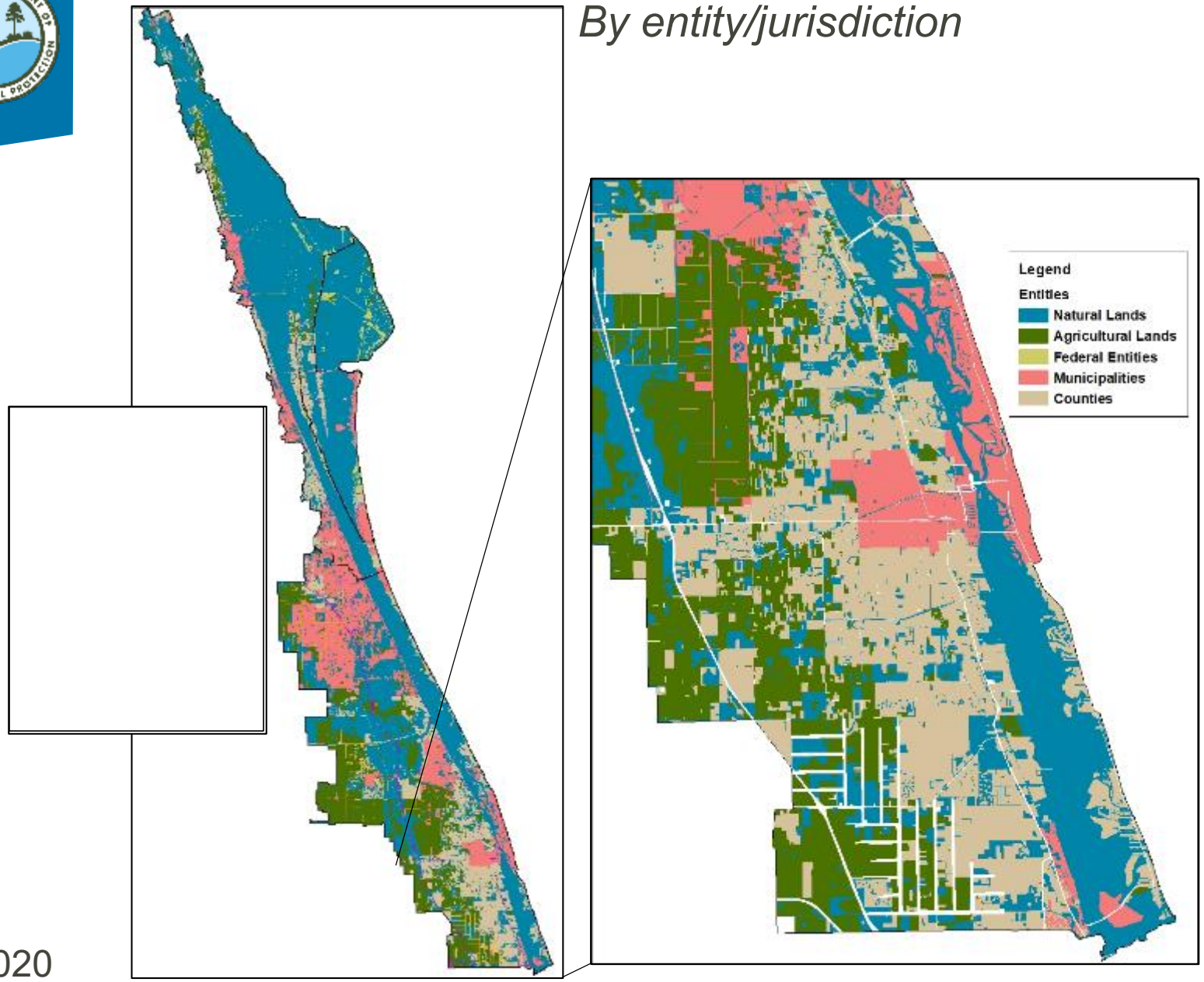
By entity/jurisdiction



1. Identify, Remove Regional Project Areas
2. Identify, Allocate, Remove Transportation ROW
3. Identify, Remove WCD Canals and ROW

Allocation Approach

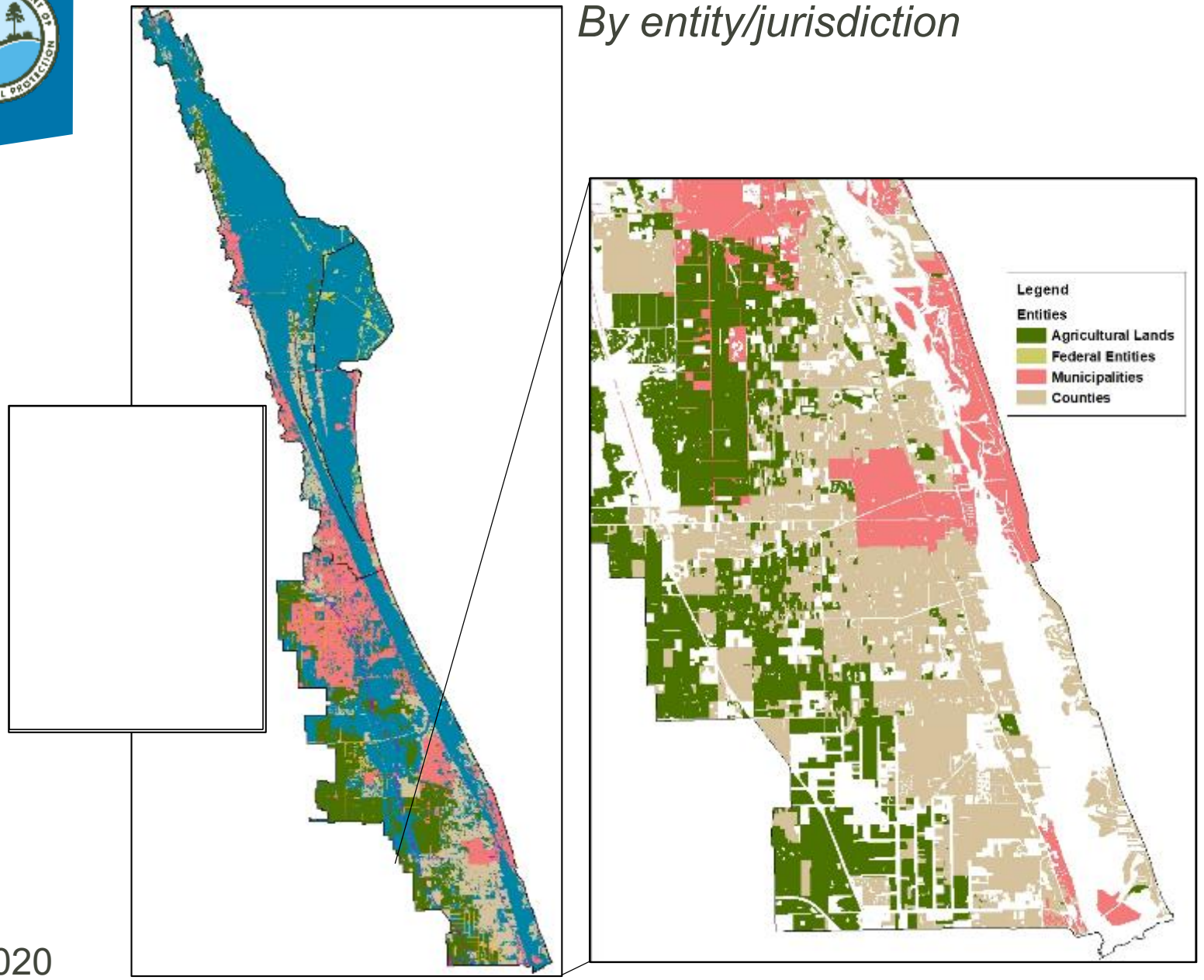
By entity/jurisdiction



1. Identify, Remove Regional Project Areas
2. Identify, Allocate, Remove Transportation ROW
3. Identify, Remove WCD Canals and ROW
4. Identify, Remove Natural Lands

Allocation Approach

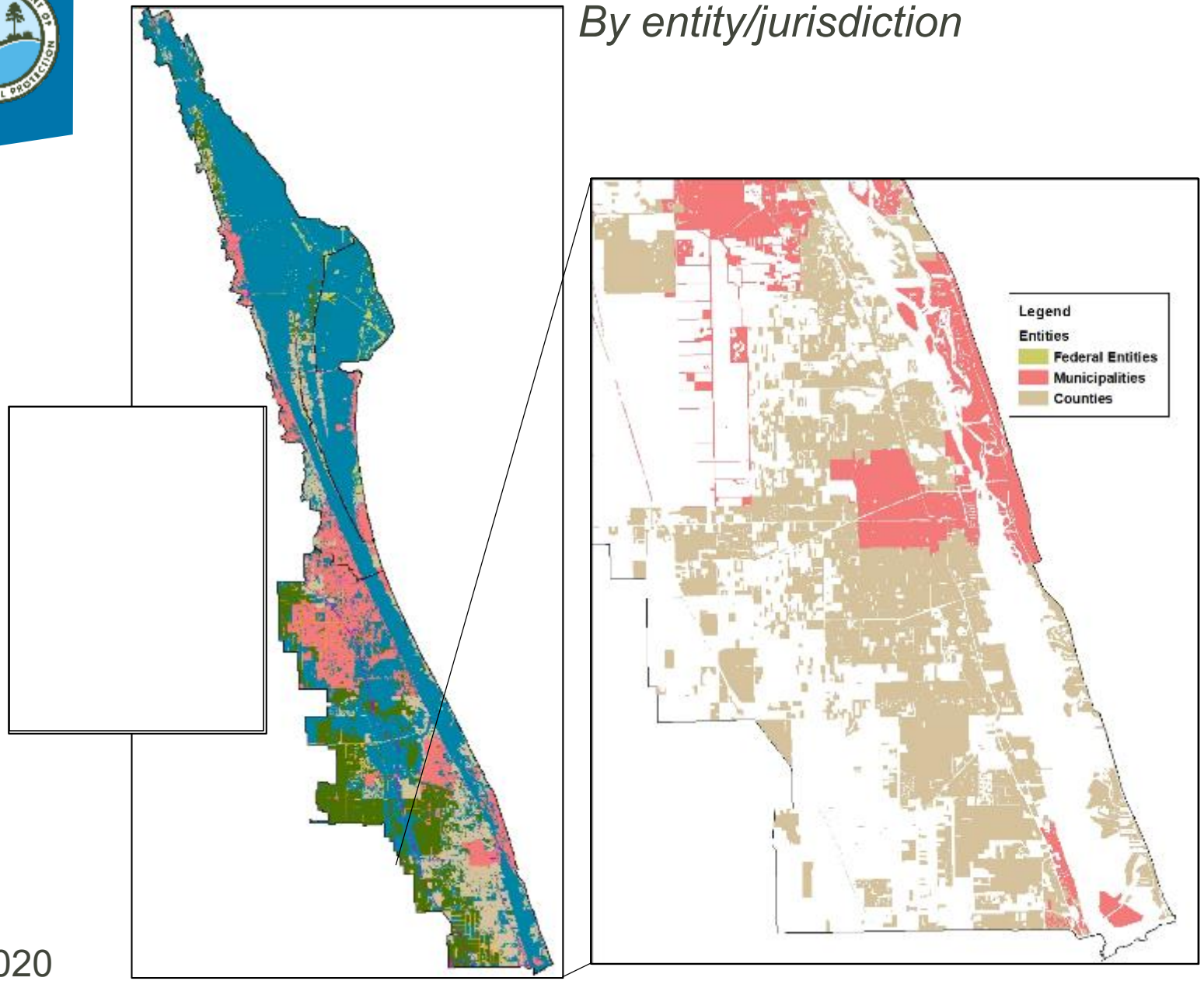
By entity/jurisdiction



1. Identify, Remove Regional Project Areas
2. Identify, Allocate, Remove Transportation ROW
3. Identify, Remove WCD Canals and ROW
4. Identify, Remove Natural Lands
5. Identify, Allocate, Remove Agricultural Lands

Allocation Approach

By entity/jurisdiction

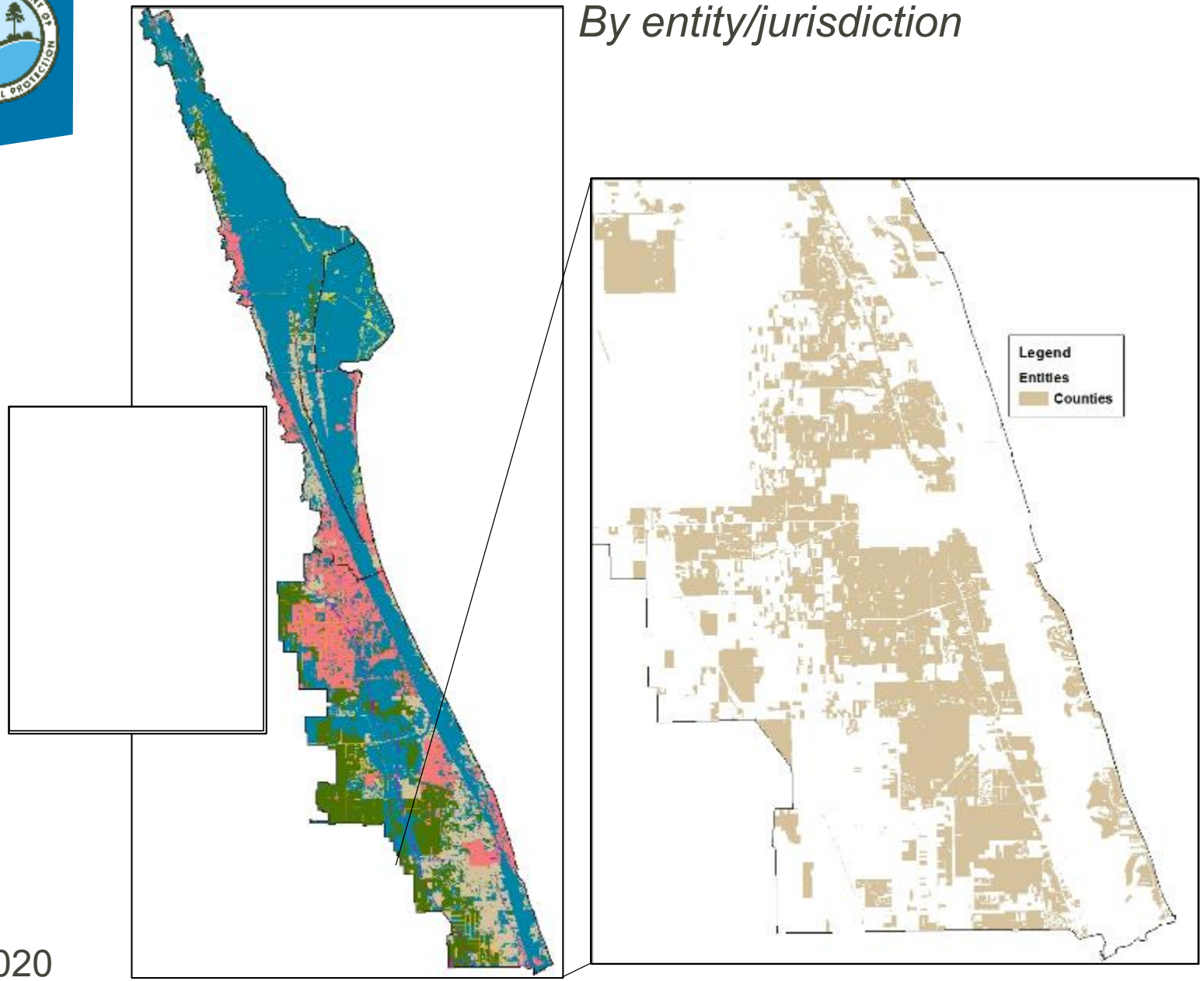


1. Identify, Remove Regional Project Areas
2. Identify, Allocate, Remove Transportation ROW
3. Identify, Remove WCD Canals and ROW
4. Identify, Remove Natural Lands
5. Identify, Allocate, Remove Agricultural Lands
6. Identify, Allocate, Remove Federal Entities*
7. Identify, Allocate, Remove Municipalities

**no federal entities in example area*

Allocation Approach

By entity/jurisdiction



1. Identify, Remove Regional Project Areas
2. Identify, Allocate, Remove Transportation ROW
3. Identify, Remove WCD Canals and ROW
4. Identify, Remove Natural Lands
5. Identify, Allocate, Remove Agricultural Lands
6. Identify, Allocate, Remove Federal Entities*
7. Identify, Allocate, Remove Municipalities
8. Identify, Allocate Counties

**no federal entities in example area*

Allocation Approach

Methodology

- Calculate Required Reductions
  - TN starting load for the entire segment group times the % TMDL reduction = total required reduction for segment group
    - e.g., *3,953,940 pounds per year (lb/yr) x 23% = 909,406 lb/yr**
  - Required reduction will be assigned to stakeholders based on their percent contribution to the total anthropogenic starting load in the segment group
- Stakeholders in Multiple Segment Groups Within the Same BMAP Will Have the Required Reductions Summed
- Reductions Will Be Tracked by Project Zones in NIRL and CIRL
- Stakeholders in Multiple BMAPs Will Have Required Reductions Remain Separate for Each BMAP

***Note that these numbers are for example purposes only and do not reflect actual allocations to any entity**

Allocation Approach

Example calculations:

Entity	Anthropogenic Starting Load	Contribution to Total	Required Reduction
A	10,000	1.4%	2,857
B	140,000	20.0%	40,000
C	350,000	50.0%	100,000
D	200,000	28.6%	57,143
Total	**700,000**	**100%**	**200,000**

BMAP X - Segment Group 1

Required Reductions
1,000,000 * 20% = 200,000

Entity	Anthropogenic Starting Load	Contribution to Total	Required Reduction
A	2,000	4.0%	960
B	10,000	20.0%	4,800
C	30,000	60.0%	14,400
D	8,000	16.0%	3,840
Total	**50,000**	**100%**	**24,000**

BMAP X - Segment Group 2

Required Reductions
80,000 * 30% = 24,000

***Note that these numbers are for example purposes only and do not reflect actual allocations to any entity**

Allocation Approach

Example calculations:

Entity	Anthropogenic Starting Load	Contribution to Total	Required Reduction
A	10,000	1.4%	2,857
B	140,000	20.0%	40,000
C	350,000	50.0%	100,000
D	200,000	28.6%	57,143
Total	**700,000**	**100%**	**200,000**

BMAP X - Segment Group 1

Required Reductions

1,000,000 * 20% = 200,000

Entity	Anthropogenic Starting Load	Contribution to Total	Required Reduction
A	2,000	4.0%	960
B	10,000	20.0%	4,800
C	30,000	60.0%	14,400
D	8,000	16.0%	3,840
Total	**50,000**	**100%**	**24,000**

BMAP X - Segment Group 2

Required Reductions

80,000 * 30% = 24,000

***Note that these numbers are for example purposes only and do not reflect actual allocations to any entity**

Allocation Approach

Example calculations:

Entity	Anthropogenic Starting Load	Contribution to Total	Required Reduction
A	10,000	1.4%	2,857
B	140,000	20.0%	40,000
C	350,000	50.0%	100,000
D	200,000	28.6%	57,143
Total	**700,000**	**100%**	**200,000**

BMAP X - Segment Group 1

Required Reductions
1,000,000 * 20% = 200,000

Entity	Anthropogenic Starting Load	Contribution to Total	Required Reduction
A	2,000	4.0%	960
B	10,000	20.0%	4,800
C	30,000	60.0%	14,400
D	8,000	16.0%	3,840
Total	**50,000**	**100%**	**24,000**

BMAP X - Segment Group 2

Required Reductions
80,000 * 30% = 24,000

***Note that these numbers are for example purposes only and do not reflect actual allocations to any entity**

Allocation Approach

Example calculations:

Entity	Anthropogenic Starting Load	Contribution to Total	Required Reduction
A	10,000	1.4%	2,857
B	140,000	20.0%	40,000
C	350,000	50.0%	100,000
D	200,000	28.6%	57,143
Total	**700,000**	**100%**	**200,000**

Entity	Anthropogenic Starting Load	Contribution to Total	Required Reduction
A	2,000	4.0%	960
B	10,000	20.0%	4,800
C	30,000	60.0%	14,400
D	8,000	16.0%	3,840
Total	**50,000**	**100%**	**24,000**

BMAP X - Segment Group 1

Required Reductions
1,000,000 * 20% = 200,000

3,817 lbs/yr*

Reductions for Stakeholder A in BMAP X

BMAP X - Segment Group 2

Required Reductions
80,000 * 30% = 24,000

**Note that these numbers are for example purposes only and do not reflect actual allocations to any entity*

SWIL Starting Loads

BMAP Area	Project Zone	Starting TN Load (lb/yr)	% Total Load TN	Starting TP Load (lb/yr)	% Total Load TP
Banana River Total	**N/A**	**271,772**	**100%**	**36,031**	**100%**
North IRL	A	403,467	53.15%	46,569	48.40%
North IRL	B	355,597	46.85%	49,652	51.60%
North IRL Total	**N/A**	**759,064**	**100%**	**96,221**	**100%**
Central IRL	A	785,972	31.37%	108,930	32.15%
Central IRL	B	567,787	22.66%	78,941	23.30%
Central IRL	SEB	882,940	35.24%	111,569	32.93%
Central IRL	SIRL	268,800	10.73%	39,401	11.63%
Central IRL Total	**N/A**	**2,505,500**	**100%**	**338,841**	**100%**

Questions & Comments

Upcoming Tasks

- Finish Draft Calculations
  - Generate draft allocations
  - Recalculate project credits
- Meet with Stakeholders Individually
  - Review draft allocations and credits
  - Discuss any new or planned projects
- Collect New Projects from All Stakeholders
- Finalize Water Control Districts Activities
- Review and Update Monitoring Network, As Needed

Next Steps

- *Review Draft Allocations with Individual Stakeholders*
- *Discuss Activity Lists with WCDs*
- *Recalculate Project Credits*
- *Collect New Projects from Stakeholders by June 30th*
- *Conduct Seagrass Analysis*
- *Hold Additional Meetings in 2020*
  - Next meeting tentatively scheduled for July 2020

Contact Information

North IRL, Banana River Lagoon

Stacy Cecil, Basin Coordinator

850-245-8683

Stacy.Cecil@floridadep.gov

Central IRL

Ted Saltos, Basin Coordinator

850-245-8521

Theodore.Saltos@floridadep.gov

Sara Davis, Environmental Manager

850-245-8825

Sara.C.Davis@floridadep.gov

Questions & Comments


FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION