NOAA Open Space Tool

Calculating and Documenting Credits Under Activity 420

Shannon Jarbeau, CFM

How to Map Open Space Preservation for the FEMA Community Rating System

Shannon Jarbeau, CFM
Barnstable County Cape Cod Cooperative Extension/
Woods Hole Sea Grant

Office for Coastal Management

CRS Activity 420:
Open Space Preservation

- Communities earn credits for permanently preserved open space
- First five elements provide credit for **parcels** that qualify for:

OSP Credit

- Open Space Preservation (OSP) – 1450 points

OSP Extra Credit

- Deed Restrictions (DR)
- Natural functions open space (NFOS)
- Special flood-related hazard open space (SHOS)
- Coastal erosion open space (CEOS)

Office for Coastal Management

CRS Activity 420:
Open Space Preservation

- Communities earn credits for permanently preserved open space
- First five elements provide credit for **parcels** that qualify for:

OSP Credit

- Open Space Preservation (OSP) – 1450 points

OSP Extra Credit

- Deed Restrictions (DR)
- Natural functions open space (NFOS)
- Special flood-related hazard open space (SHOS)
- Coastal erosion open space (CEOS)

Office for Coastal Management

How To Map Open Space Preservation (OSP) for Community Rating System Credits

1. Step-by-step instructional "How To" guide (for planners)

2. GIS workflow (for GIS analysts)

- Supplementary documents
  - Before you get started
  - **GIS dataset checklist**
  - Job aid for calculating credits

Office for Coastal Management

Digital Coast Partnership CRS Strategy

ASFPM and CSO Green Guide

TNC CRS Explorer

NOAA How To Guide & GIS Workflow

Climate Central's Surging Seas CRS Guide

Office for Coastal Management

Workflow Steps

1. Calculate the community's impact adjusted SFHA

2. Identify lands that may qualify as open space

3. Exclude areas that do not qualify

4. Calculate the number of possible OSP credits $rOSP = aOSP/aSFHA$ (x 1,450 points)

5. Determine if parcels qualify for "extra credit"

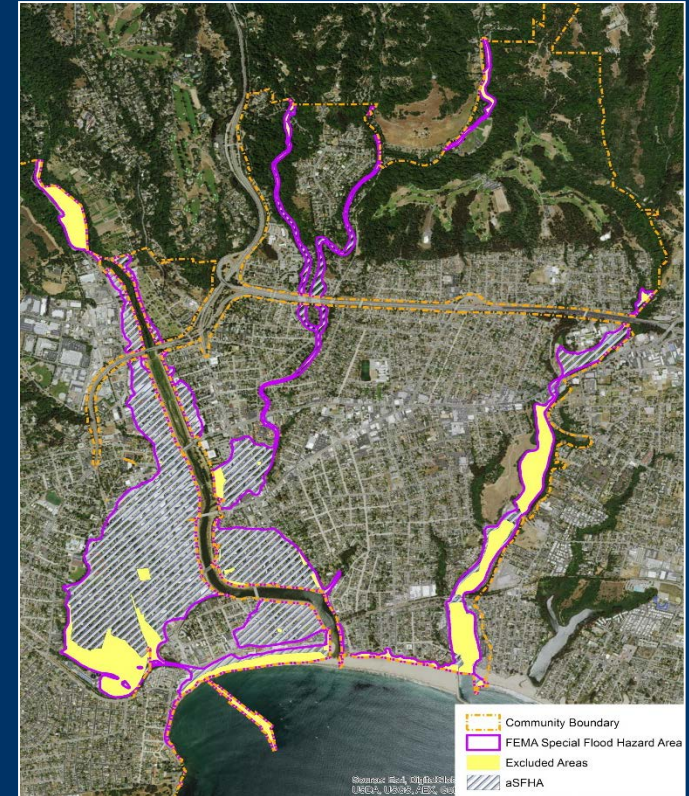# Step 1: Map the impact adjusted special flood hazard area

Required GIS Data

- Special Floodplain Hazard Area (SFHA)
- Community boundary
- Federal lands
- Open water

GIS Analysis

- Calculate the acreage of the SFHA
- Adjust the total area of the SFHA
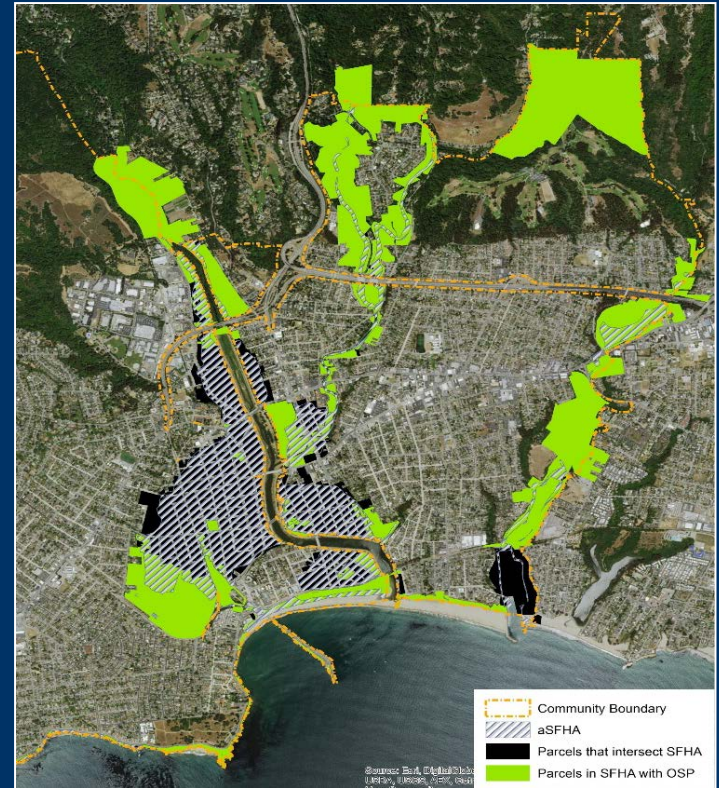- **aSFHA** is the basis for open space calculations (denominator)

$$rOSP = aOSP/aSFHA \ (x \ 1{,}450 \ points)$$

Office for Coastal Management

Step 2: Identify lands that may qualify for OSP credits

Required GIS Data

- aSFHA

- Parcel database

- Protected areas

- Coastal or riverine setbacks

- Land use and zoning

- Land cover

GIS Analysis

- Identify parcels that intersect the aSFHA and regulatory floodplain

- Query aSFHA parcel intersection using land use attribute

- Overlay land types that may qualify as "preserved" open space

Office for Coastal Management

Step 3: Exclude areas that do not qualify for OSP credits

Required GIS Data

- Regional or high-resolution land cover

- High-resolution imagery

GIS Analysis

- Identify the portion of parcels covered by impervious surfaces

Option 1: Reclass high resolution land cover dataset
Option 2: Calculate percent impervious using regional land cover
Option 3: Perform image classification using ortho-imagery

Office for Coastal Management

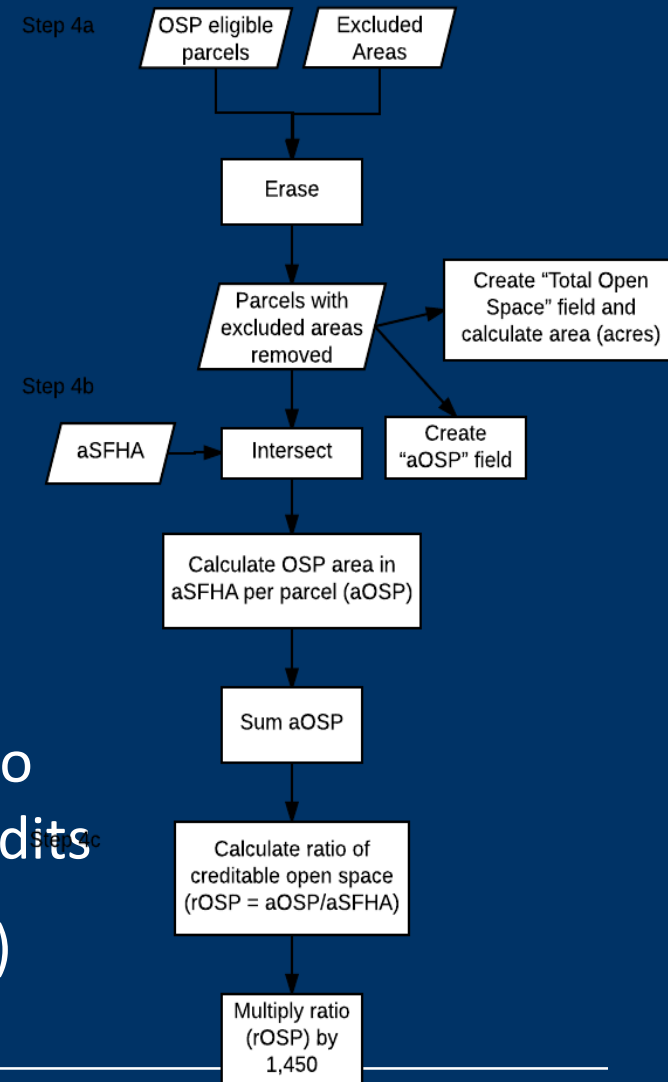# Step 4: Calculate the number of possible OSP credits

Required GIS Data:

- aSFHA (Step 1)

- OSP eligible parcels (Step 2)

- Excluded Areas (Step 3)

GIS Analysis

- Subtract ("erase") disqualifying areas

- Sum total area that qualifies, or **aOSP**

- Calculate the impact adjustment ratio to determine the total number of OSP credits

    rOSP = **aOSP/aSFHA** (x 1,450 points)

Step 4a

OSP eligible parcels → Excluded Areas → Erase → Parcels with excluded areas removed → Create "Total Open Space" field and calculate area (acres) → Create "aOSP" field

Step 4b

aSFHA → Intersect → Calculate OSP area in aSFHA per parcel (aOSP) → Sum aOSP

Step 4c

Calculate ratio of creditable open space (rOSP = aOSP/aSFHA) → Multiply ratio (rOSP) by 1,450

Step 5: Determine if OSP parcels qualify for "extra credit"

Required Data

- OSP eligible parcels
- Protected areas

GIS Analysis

- Select parcels that qualify for Deed Restrictions (DR) and Natural Function Open Space (NFOS)
  - NFOS 1 – Preserved areas in natural state
  - NFOS 3 – Critical fish/wildlife habitat
- Calculate qualifying area and calculate ratio
- Add extra points

Office for Coastal Management

GIS Dataset Checklist and Sources

- **Community layers**
  - Special floodplain hazard area (SFHA) from FEMA's NFHL
  - Parcels and land use, zoning
- **Excluded areas**
  - Federal Lands
  - Open water
  - Impervious surfaces
- **Open spaces areas**
  - Protected areas (e.g. conservation easements, land trusts)
  - Land cover
  - Critical habitat and water/biological resources

Job Aid: Worksheet for Calculating Open Space Credits under Activity 420

Instructions: In column B, add a unique parcel name for each property being documented. (Note: this name should be consistent with the impact adjustment map.) In column B, insert the total acreage of the parcel. In column C, insert the area of each parcel that falls within the SFHA and qualifies as protected open space (after excluding ineligible areas), using the results from a GIS or other parcel analysis. In column E, list the FEMA flood zone, or zones, in which the parcel falls. In column F, add the name of the parcel's owner. In column G, add the parcel's land use designation from property tax assessor records.

SUMMARY TABLE - Parcel documentation and Summary of Potential Credits (Parcels 1-10)

Location (Parcel Name or Number)	Total Acreage for Parcel	Area of parcel within SFHA (or regulatory floodplain) that qualifies as protected open space (aOSP)	Flood zone of parcel (particularly for any parcel outside SFHA but within regulatory floodplain)	Name of Parcel Owner	Parcel's Land Use Designation	Element 422 a. Preserved Open Space Credits (cOSP)	Element 422 b. Credits for Deed Restrictions (cDR)	Element 422 c. Credits for Natural Functions Open Space (cNFOS)	Element 422 d. Credits for Special Flood Hazards Open Space (cSHOS)	Element 422 e. Credits for Coastal Erosion Open Space (cCEOS)	Element 423 Subtotal - Credits for Preserved Open Space:
e.g. City Parks	*236*	*143.2*	*AE*	*City*	*Public parks*	*411.66*	*2.41*	*85.17*	*6.54*	*16.69*	*522.47*
City Parks	236	143.2	AE	City	Public parks	411.66	2.41	85.17	6.54	16.69	522.47
Country Club	73	55.3		South Scottsdale Country Club	Golf course	158.97	5.48	0.00	0.00	0.00	164.45
Indian Bend Wash Floodway	29.1	29.1		Private	Residential / Commercial	83.65	0.00	0.00	4.76	6.45	94.86
McCormick Creek Floodway	15.3	15.3		Private	Residential	43.98	0.00	0.00	0.00	0.00	43.98
						0.00	0.00	0.00	0.00	0.00	0.00
						0.00	0.00	0.00	0.00	0.00	0.00
						0.00	0.00	0.00	0.00	0.00	0.00
						0.00	0.00	0.00	0.00	0.00	0.00
						0.00	0.00	0.00	0.00	0.00	0.00
						0.00	0.00	0.00	0.00	0.00	0.00
Totals:	353.40	242.90				698.27	7.89	85.17	11.30	23.15	825.77

Office for Coastal Management

Where You'll find it

Questions & Feedback?

 Rebecca.Love@noaa.gov

 How To Guide: Elaine.Vaudreuil@noaa.gov

 GIS Workflow: Melissa.Rosa@noaa.gov