Table 1. CRS 400 Series Credit for **Open Space Preservation** (CRS 420 Activity) and Higher Regulatory Standards **Freeboard** (CRS 430 Activity)

Green Highlighted Text: GIS layers and values prepared by Maneesh for inputs for Community Reports
Cyan Highlighted Text: Values computed by Yibing for Community Reports

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| **CRS** | CRS-422.a | CRS-422.b | CRS-422.c | CRS-432.b |
| **Activity** | **Acres of Open Space Preservation (OSP) in the Regulatory Floodplain (SFHA)** | **Acres of Deed Restricted (DR) in SFHA** | **Acres of Natural Functions Open Space (NFOS) in SFHA** | **Freeboard for SFHA minus OSP**(Areas requested for FRB credit must exclude areas credited for OSP) |
| **Report** | aSFHA (mSFHA), aOSP, aPublic, aPrivate, aDR rOSP, cOSP | aDR, rDR, cDR | aNFOS, rNFOS, cNFOS | FRB, aFRB, rFRB, cFRB |
| **GIS** | GIS Files: Public Lands (aPublic) + Private Lands (aPrivate) + Buyout Properties (aDR)  | GIS Files: Buyout Properties (aDR) | GIS Files: Rare & Endangered Species (aNFOS) | Freeboard Amount (FRB) (Presume 2 feet) |
| **Impact Adjust-ments****Ratios to SFHA** | **aOSP** total area of parcels that qualify for OSP credit**rOSP** = aOSP / aSFHA, where aOSP = the size of the area(s) preserved as open space (OSP) in the regulatory floodplain, and aSFHA = the size of the community’s SFHA shown on its FIRM | rDR = aDR / aSFHA , where aDR = the size of the area(s) that qualify for deed restriction credit (DR), and aSFHA = the size of the community’s SFHA shown on its FIRM rDR cannot be greater than rOSP | rNFOS# = aNFOS# / aSFHA , where aNFOS# = the size of the area(s) that qualifies for NFOS credit (aNFOS1 is the area of all parcels that qualify for NFOS1 credit, etc.) and aSFHA = the size of the community’s SFHA shown on its FIRM rNFOS# cannot be greater than rOSP | Freeboard (FRB) = 2 feetFreeboard\_Points = 225aFRB = aSFHA – aOSP rFRB = aFRB / aSFHAaFRB = the size of the area(s) that qualify for FRB credit for aSFHA minus the aOSP under Activity 420 (Open Space Preservation) |
| **CRS Credit** | **cOSP** = rOSP x 1450 | **cDR** = rDR x 50 | **cNFOS** = (rNFOS1 x 190) + (rNFOS3 x 50) | **cFRB** = rFRB \* 225 |
| **CRS Reference** | OSP: CRS Manual 2017, 422.a, page 420-3 | DR: CRS Manual 2017, 422.b, page 420-12 | NFOS: CRS Manual 2017, 422.c, page 420-14 | FRB: CRS 2017, 432.b, page 430-11 |

Table 2. CRS 520 Activity Credit for **Building Acquisition and Relocation**

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| **CRS** | CRS-523.b |
| **Activity** | **Number of Primary Buildings Acquired or Relocated in SFHA (bAR) or out of SFHA (bARSF)**There are two options for calculating the total value for this activity. The first, Option 1, is easier to use, but is limited to 190 points. Option 2 allows for higher credit, but it favors communities that have cleared more than a small percentage of the buildings in their SFHA. Option 1 produces more credit for large communities or for a community that has cleared a small percentage of properties within the regulatory floodplain. |
| **Report** | bAR (bARSF), bRL, bSRL, bCF, rAR, bSF |
| **GIS** | bAR |
| **Credit Calculation** | bSF = the number of buildings in the SFHA bAR = # buildings acquired or relocated (bAR) from the "regulatory floodplain" since FIRM effective datebARSF = the number of buildings acquired or relocated out of the SFHA. Same as bAR for West Virginia.bRL = Repetitive Loss propertiesn (bRL)bSRL = Severe Repetitive Loss properties (bSRL)bCF = Critical Facilities (bCF) mapped to (500-year) regulatory floodplainrAR = ratio of buildings acquired or relocated in SFHA to bSF**<< Option 1 (Maximum 190 points) >>****c520-1** = (bAR x 3) + (bRL x 6) + (bSRL x 9) + (bCF x 6)**<< Option 2 (Maximum 2,250 points) >>**If the SFHA is cleared out, c520 = the maximum of 2,250 points. This is done in two steps:*Step 1 calculates the credit based on 1,900 points. Step 1 cannot exceed 1,900.**Step 2 adds bonus points based on how much of the SFHA has been cleared out. Step 2 only applies if more than 30% of the buildings in the SFHA have been removed. Step 2 cannot exceed 350 points.**c520 = the credit for Step 1 + the credit for Step 2**Option 2, Step 1*c520-2.1 = 1,900 x ((bAR + (bRL x 2) + (bSRL x 3) + (bCF x 2)) / (bSF + bAR + bRL+ bSRL + bCF)) *Option 2, Step 2* Applies if the community has acquired or relocated more than 30% of the buildings in its current SFHA, or rAR = bAR / (bSF + bAR)Each building is only counted once; no extra credit.If rAR > 30% then c520-2.2 = (((bAR x 100) / (bSF + bAR)) – 30) x 5 If rAR <= 30% then c520-2.2 = 0**c520-2** = c520-2.1 + c520-2.2 |
| **CRS Credit** | **c520-1** = (bAR x 3) + (bRL x 6) + (bSRL x 9) + (bCF x 6)**c520-2** = c520-2.1 + c520-2.2 |
| **CRS Reference** | Acquisition & Relocation (c520): Coordinator's Manual 2017, 523.a & 523.b, page 520-8 |

**Assumptions and conditions of the CRS Credit Calculations in West Virginia:**

* The **“OSP”** (CRS-422.a) credits can be given for the preserved open spaces located in the community’s regulatory floodplains including the SFHA as shown on the community’s Flood Insurance Rate Map (FIRM) or another floodplain with similar development regulations. In West Virginia, it can be considered just the same as the Special Flood Hazard Area (SFHA) because there is no other regulatory floodplain.
* The **impact adjusted SFHA** must be used in the base maps and area calculations that means the exclusion of large waterbodies (larger than 10 acres) in addition to federal lands from the SFHA area.
* The projected coordinate system of **NAD 1983, UTM Zone 17N** is applied in the GIS files used in all area calculations of the CRS credits in West Virginia.
* To be considered as **“open space”**, it is assumed that there are no buildings or structures, filling, large pavement, or other encroachment to flood flows in the parcels.
* To be qualified as **“preserved”** open space, all of the parcels included in the calculations are assumed to be attached with a signed statement by a public or creditable private owner or some regulations on the parcel preventing from construction, fillings, or other encroachments on flood flows in the future.
* All of the OSP parcels are assumed to be vacant at the time of application for the CRS credit.
* The calculations of **“deed restrictions (DR)”** (CRS-422.b) only apply to the areas qualified for OSP, as a prerequisite. It is assumed that there is a deed for the parcels with the explicit language indicating the following restrictions:

(a) No new buildings may be allowed on the property;

(b) The restriction runs with the land; and

(c) The restriction cannot be changed by a future owner; rather, it can only be amended by a court for just cause.

* To be eligible for the **“Natural Functions Open Space (NFOS)”** (CRS-422.c), the properties are assumed to be managed to keep the undeveloped natural state (for NFOS1) or designation as critical habitat for threatened or endangered species (for NFOS3).
* For the calculations of **“Freeboard (FRB)”** (CRS-432.b), a 2-foot freeboard is assumed in West Virginia. The areas previously calculated in the open space preservation credit (cOSP) are excluded from the freeboard area.
* In the calculations of **“Acquisition and Relocation”** (CRS-523.b), the assumption is that all the buyout properties had buildings that have been acquired or relocated from the regulatory floodplain since the FIRM effective date. (In the Mount Hope study, is was investigated manually by the parcel history of the properties, but it is not possible for the entire state at this point).
* As there is no other regulatory floodplain in West Virginia, in calculations of step 2 of the option 2 (c520-2.2), the number of buildings acquired or relocated out of the SFHA (bARSF) is the same as the number of buildings acquired or relocated from the regulatory floodplain (bAR).
* No credit was given for removed structures that were on FEMA’s list of Repetitive Loss Structures.





