

Stormwater Management BMP Map



Stormwater Management BMP Type

(1)

- **Bio-retention Filter (Rain Garden)** 1
- 2 Detention Pond / Dry Pond

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- 3 Detention (Underground)
- 4 Green Roof
- 5 Hydrodynamic Separator
- 6 Land Use Change / Conservation Landscaping
- 7 **Oil/Water Separator**
- 8 Permeable Pavement
- 9 Rainwater Harvesting
- 10 Retention Pond / Wet Pond
- 11 Sand Filter
- 12 Stormfilter
- 13 Stream Restoration
- Tree in a Box (Filterra) 14
- 15 Wetlands



There are many different types of stormwater Best Management Practices (BMP's). Some are designed to deal with water quantity and store stormwater run-off and release at a slower rate to reduce downstream flooding and erosion, while others are designed more for water quality and filter potential pollutants that drain through the practice. And then there are some that do both! Following is a quick summary of stormwater BMP's that can be found on JMU's campus.

1. Bio-retention filters, more commonly known as rain gardens, are constructed treatment areas that slowly release collected stormwater run-off and filters gathered pollutants naturally through plants, mulch and soil media. There are about 33 bio-retention filters of various sizes located on JMU's campus.

2. Detention, or dry ponds are constructed to provide general flood protection, collecting stormwater run-off and releasing it down stream at a slower rate helping reduce possible flooding downstream. There are 11 detention ponds located on JMU's campus.

3. Detention ponds can also be constructed underground in vaults and work the same as above ground, and generally go unnoticed. Most are a collection of concrete vaults, and there are 3 underground detention systems located on JMU's campus.

4. Green, or living roof, is a constructed roof with vegetation and soil media planted over a waterproof membrane. In addition to reducing the amount of run-off leaving a property, this practice also has additional benefits such as thermal reduction and energy conservation. There are two installations on JMU's campus, one of which is a demonstration area at Madison Union.

5. Hydrodynamic separators are manufactured structures that separates sediment and other pollutants as they flow through the structure. Collected sediment and debris will then need to be removed during maintenance cleanings. There are 12 hydrodynamic separators on JMU's campus.

6. Land use changes, or conservation landscaping, is the process of taking hardscape surfaces or typical "lawns" and changing the type of plants in the area to allow meadows and/or additional tree density. JMU's Hillside Project has taken 3.6 acres of turf and made this change. Also throughout campus, vegetation has been allowed to grow adjacent to streams to provide a riparian buffer.

7. Oil/Water separators are an underground tank system installed to collect petroleum products in the case of a large accidental spill, thus preventing the product from getting into our local streams. JMU has one oil/water separator located at their fueling facility.

8. Permeable pavement allows for hardscapes such as sidewalks, parking lots and roadways but also allows for infiltration of precipitation. There is one installation of pavers on JMU's campus located at parking lot A near Wilson Hall.

9. Rainwater harvesting is a process of capturing stormwater run-off and reusing it on-site. JMU has one installation of this practice on campus located at Wayland Hall.

10. Retention, or wet ponds work very similarly to dry ponds except they will have a permanent pool of water. There is one installation of this practice on JMU's campus located near ISAT.

11. Sand filters are another type of infiltration practice that works very similarly to bio-retention filters except the media is mainly comprised of sand and the practices are not landscaped with the plants that are part of bio-retention filters. There is one installation of this practice on JMU's campus located below the UREC turf field.

12. Stormfilters are another manufactured filtering device that are installed underground and filters stormwater as it flows through the storm sewer system. There are 12 stormfilters installed on JMU's campus.

13. Stream restoration is the process of re-engineering the stream to include natural design concepts to help ensure bank stabilization and re-connect the stream to the floodplain. JMU has restored approximately 3,700 linear feet of stream through the campus.

14. Tree in a Box is another manufactured practice that basically puts a one-plant rain garden in a storm drain inlet. This will treat the first run-off from a storm event which will typically have the majority of fresh pollutants in the drainage area. There are 13 tree in a box units on JMU's campus.

15. Wetlands, or in this case constructed wetlands, are a natural biofilter installed to treat pollutants from stormwater runoff. Several "pocket" wetlands were installed along with the stream restoration work in the arboretum which also allows for additional connection to the floodplain and water storage during flooding events.



