**Ecosystem Type: FORESTS**

**Category: Climate Stabilization**

1. **Materials**

***Supplier*** – Forests influence the amount of water available that can influence the moisture balance, which affects how climate change (Mátyás and Sun, 2014). Cities like Chicago, IL rely on urban forests for transpiring water and shading structures to control the local climate (McPherson, Nowak, and Rowntree, 1994). There are buildings that depend on these forests to decrease energy use due to climate control (McPherson, Nowak, and Rowntree, 1994). This ecosystem type creates shade, which helps reduce heat

***Driver*** – not applicable

***Demander*** – not applicable

1. **Nutrition**

***Supplier*** – not applicable

***Driver*** - not applicable

***Demander*** - not applicable

1. **Energy**

***Supplier*** – not applicable

***Driver*** - not applicable

***Demander*** - not applicable

1. **Mediation of Waste, Toxics, and Other Nuisances**

***Supplier*** – no literature review available at this time

***Driver*** – not applicable

***Demander*** – not applicable

1. **Mediation of Flows**

***Supplier*** – Forests mediate the flow of water, which changes the flux of moisture that impacts the effect water has on climate (Ellison et al, 2017). A study shows that trees play a large part in evaporating water, which can cool down microclimates in areas like a large city or neighborhood (McPherson, Nowak, and Rowntree, 1994).

***Driver*** – not applicable

***Demander*** – not applicable

1. **Maintenance of Physical, Chemical, and Biological Indicators**

***Supplier*** – Forests uptake green house gases that contribute to climate change, such as carbon dioxide (Davidson, Belk and Boone, 1998, Beer et al, 2010). Tropical forests uptake ~32 percent of the total carbon produced each year (Beer et al, 2010). One study found that terrestrial plants remove ~122 billion tons of carbon dioxide each year (Beer et al, 2010). That means that tropical forests remove 39.04 billion tons of carbon dioxide each year!

***Driver*** – not applicable

***Demander*** – not applicable

1. **Spiritual, Symbolic, Religious, and Social Experiences**

***Supplier*** – not applicable

***Driver*** – not applicable

***Demander*** – not applicable

1. **Physical and Intellectual Interactions w/ Biota, Ecosystems, and Land/Seascapes**

***Supplier*** – not applicable

***Driver*** -not applicable

***Demander*** - not applicable

**Sources:**

Beer, C. et al. (2010) Terrestrial Gross Carbon Dioxide Uptake: Global Distribution and Covariation with Climate. *Science, 329*(5993), 834-838. DOI: 10.1126/science.1184984. [abstract only]

Davidson, E.A., Belk, E., and Boone, R.D. (1998) Soil water content and temperature as independent or confounded factors controlling soil respiration in a temperate mixed hardwood forest. *Global Change Biology, 4*(2), 217-227. DOI: 10.1046/j.1365-2486.1998.00128.x. [abstract only]

Ellison, D. et al (2017) Trees, forests and water: Cool insights for a hot world. *Elsevier, 43*, 51-61. <https://doi.org/10.1016/j.gloenvcha.2017.01.002>.

Mátyás, C. and Sun, G. (2014) Forests in a water limited world under climate change. *Environmental Research Letters, 9*. doi:10.1088/1748-9326/9/8/085001.

McPherson, E.G., Nowak, D.J., and Rowntree, R.A. (1994) Chicago’s Urban Forest Ecosystem: Results of the Chicago Urban Forest Climate Project. *USDA General Technical Report NE-186.*