Using the National Riparian Area Base Map in Forests to Faucets 2.0

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October 2019
National Forests to Faucets 2.0 Builds upon...
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Analysis Objectives

- **Ability to Produce Clean Water**
  Determine relative Ability to Produce Clean Water at HUC12 watershed level (APCW)

- **Importance to Surface Drinking Water**
  Rate a watersheds’ importance to surface drinking water (IMP).

- **Identify Important Forests**
  Identify forests protecting surface drinking water

- **Analyze Risks**
  Analyze potential risks to surface drinking water, present and future
ANALYSIS
DESIGN

MODEL INPUTS

Watershed Characteristics*
- % Natural cover
- % Agricultural Land
- % Riparian Natural cover
- % Impervious
- Mean annual water supply (WASSI)

Water Use & Supply
- Mean annual water supply (WASSI)
- Water Use (USGS)
- Surface drinking water intake locations & pop.

Land Cover/Owernship
- NFS Forests
- Private Forests
- Protected Forests
- All Forests

Risks
- Wildland Fire Potential
- Insect and Disease Risk
- Climate - Development Pressure
- Climate - Change in Water Supply

MODEL OUTPUTS

Ability to Produce Clean Water Current Conditions*

Surface drinking water importance

Forest importance to surface drinking water

Threatened forests important to surface drinking water

ABILITY TO PRODUCE CLEAN WATER

Assess subwatersheds across the conterminous US to identify those with the natural ability to produce clean water based on its biophysical characteristics (APCW).
# Ability to Produce Clean Water (APCW)

$$APCW = (N + A + I + R) \times Q$$

## Ability to Produce Clean Water (APCW)

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Rating →</th>
</tr>
</thead>
<tbody>
<tr>
<td>N = Percent Natural Cover</td>
<td>Very High</td>
</tr>
<tr>
<td></td>
<td>(4 points)</td>
</tr>
<tr>
<td>A = Percent agricultural land</td>
<td>&lt; 10</td>
</tr>
<tr>
<td>I = Percent Impervious</td>
<td>0-1</td>
</tr>
<tr>
<td>R = Percent riparian natural cover</td>
<td>&gt; 70</td>
</tr>
<tr>
<td>Q = Mean annual water yield</td>
<td>&gt; 800 mm</td>
</tr>
</tbody>
</table>

$$Q = \text{Mean annual water yield}$$

$$APCW = (N + A + I + R) \times Q$$
PERCENT RIPARIAN NATURAL COVER

30m Buffer vs Variable Width
PERCENT RIPARIAN NATURAL COVER
PERCENT RIPARIAN NATURAL COVER

Sinan Abood, a USFS research fellow, and USGS to develop a variable width riparian buffer using the 50yr flood for the Conterminous US.
ABILITY TO PRODUCE CLEAN WATER (APCW)

APCW = (N + A + I + R) * Q

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(A + N + I + R) * Q = APCW
IMPORTANCE TO SURFACE DRINKING WATER

Assess subwatersheds across the US to identify those important to surface drinking water (IMP)
RELATIVE IMPORTANCE TO SURFACE DRINKING WATER (IMP)

IMP = Qn * PRn
IDENTIFY IMPORTANT FORESTS

Identify forest areas that protect drinking water in these important subwatersheds.
FOREST OWNERSHIP

This analysis highlights the relative importance of:

a) all forest lands,
b) National Forest system lands,
c) other Protected lands
and
d) unprotected private forest lands.
ANALYZE RISK

Identify subwatersheds where risks affect surface drinking water.
WILDFIRE POTENTIAL

Areas with high and very high Wildfire Hazard Potential were multiplied by APCW and IMP to achieve the final index.

\[
\frac{(APCW \times IMP \times Fire)}{10,000}
\]
INSECT AND DISEASE RISK

Areas were multiplied by APCW and IMP to achieve the final index. Risk is defined as at least 25% of standing live basal area greater than one inch in diameter will die over a 15-year time frame (2013 to 2027) due to insects and diseases.

\[
\frac{(APCW \times IMP \times IDRisk)}{10,000}
\]
DEVELOPMENT RISK

EPA ICLUS Land Use data was used to evaluate development risk, which models land use change based on socioeconomic and climate scenarios at 10 year intervals at 90m pixels. We used change between 2010-2040, and 2010-2090 using a low and high growth/emission scenarios. For 4 total scenarios. For each scenario, we calculated the percent landuse change for each subwatershed and this was multiplied by APCW and IMP to achieve the final index.

\[
\frac{(APCW \times IMP \times DevRisk)}{10,000}
\]
DECREASED WATER YIELD

Water yield for the years 2010, 2040, and 2090, calculated using WASSI, a water balance model from the Southern Research Station. We calculated the percent water yield decrease between 2010-2040 and 2010-2090 under 2 emission scenarios and multiplied by APCW and IMP to achieve the final index.

\[(\text{APCW} \times \text{IMP} \times \%\Delta Q)/10,000\]
Next Steps

Data Release
Provisional data is available now!

Watershed Tool
Interactive tool with reports, data download, selection off downstream watersheds

Technical Report
GTR (General Technical Report) is in draft.

Webinars
Data Presentation and Watershed Tool Demos

Change the world!
Use the data and change the world!
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