Stream ecosystem changes in Schoharie Creek tributaries following Hurricane Irene and Tropical Storm Lee.

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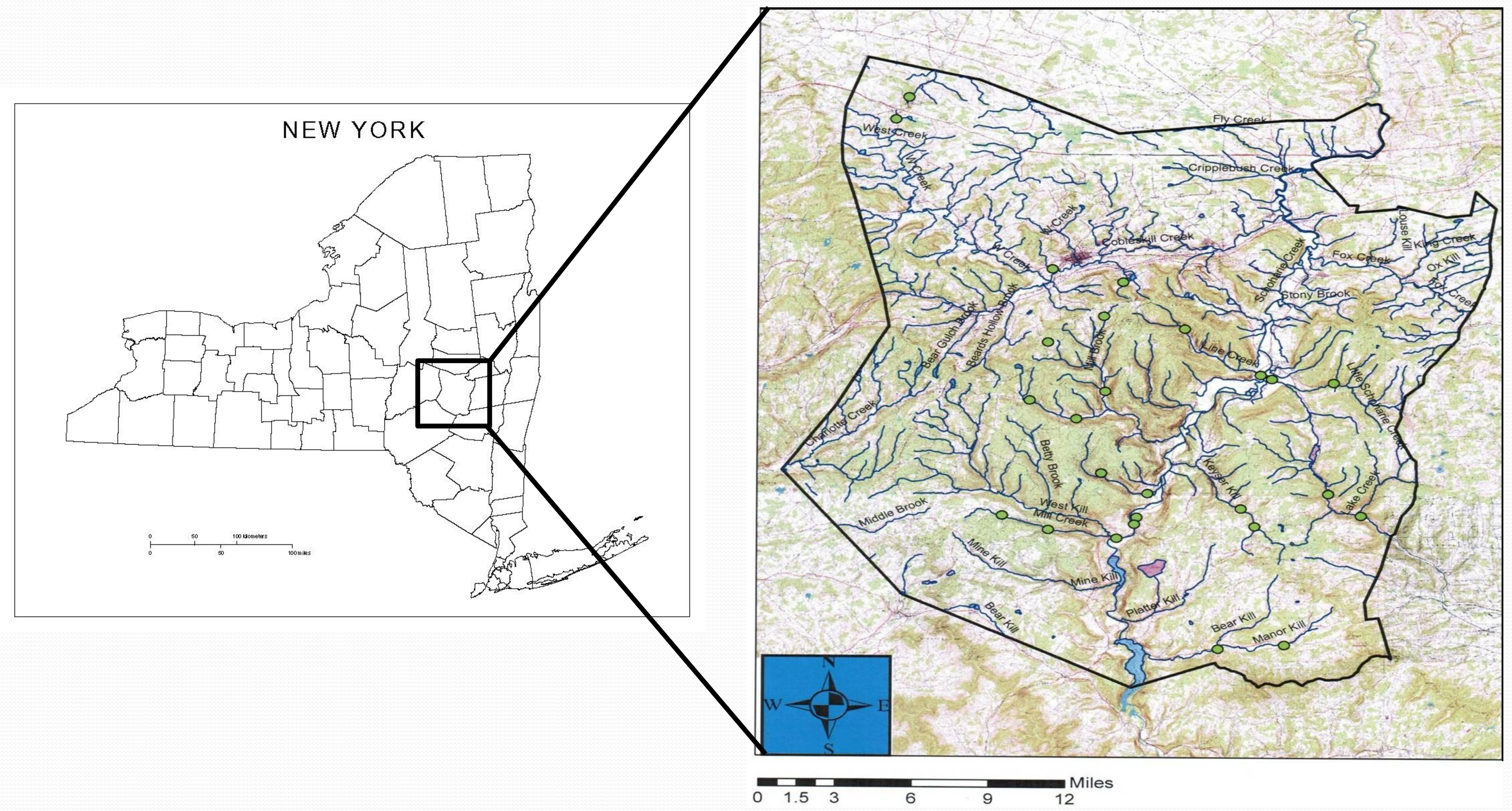
Abstract

- Hurricane Irene and Tropical Storm Lee delivered an unprecedented, 500 year flood event to the Schoharie Creek watershed on 28 Aug. & 6 Sept. 2011.
- Eight (8) streams in the upper watershed that historically contained trout (Bearkill, House Creek, Keyserkill, Line Creek, Little Schoharie, Manorkill, Platterkill and Panther Creek) were surveyed before the storms (1 survey in period 2005-2011) were revisited in spring of 2012 after the flooding.
- Initial flooding was severe, devastating much of the counties infrastructure, including many roads & bridges needed to access the study sites.
- Six months post-Irene, the actual flood and the ensuing mitigation impacts (including channelization, sinuosity reduction, berms, riparian reductions, commonly occurring together) dominated 75% of study sites (12 of 16).
- Altered study reaches have lost sinuosity, in-stream cover, riparian canopy and habitat complexity.
- Sensitive members of the fish community show declines compared to relatively unaltered reaches.



Methods

- A rapid biological assessment was conducted at each stream.
- Fish populations were sampled using a Halltech backpack shocker for 500 seconds.
- Sensitive species were measured & released back to the stream.
- Water quality parameters were measure using a Hydrolab Quanta & HACH test kits.
- Gradient, discharge, turbidity & other physical habitat measurements were recoorded.
- Impacts of flooding , including channelization, berming, decreased sinuosity, down cutting and/or aggradion were assessed from aerial images & site visits.

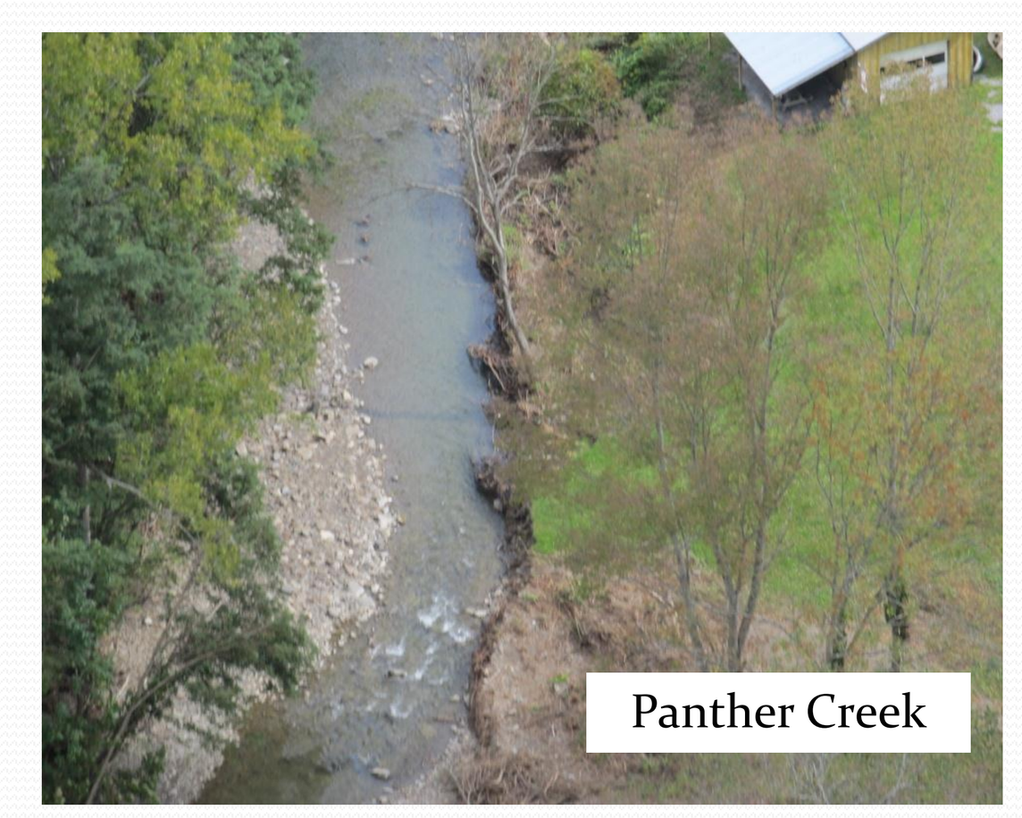
Habitat Altered	Alkalinity (mg/L)	Turbidity (NTU)
Not Significant	13.7 Low	1.70 (In Range)

Optimal range for alkalinity = 100-400 mg/L

Habitat Altered	Alkalinity (mg/L)	Turbidity (NTU)
Yes	26.0 Low	3.05 Marginal

Optimal range for turbidity = 0-2 NTU

Habitat Altered	Alkalinity (mg/L)	Turbidity (NTU)
Yes	22.3 Low	2.20 Marginal



Habitat Altered	Alkalinity (mg/L)	Turbidity (NTU)
Yes	15.0 Low	3.15 Marginal

Habitat Altered	Alkalinity (mg/L)	Turbidity (NTU)
Yes	59.4 Low	6.15 High

Habitat Altered	Alkalinity (mg/L)	Turbidity (NTU)
Yes	59.9 Low	12.3 High

Habitat Altered	Alkalinity (mg/L)	Turbidity (NTU)
Yes	77.0 Marginal	10.8 High

Habitat Altered	Alkalinity (mg/L)	Turbidity (NTU)
Yes	43.0 Low	18.2 High


Sculpin CPUE
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Trout CPUE
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Sculpin CPUE
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Trout CPUE
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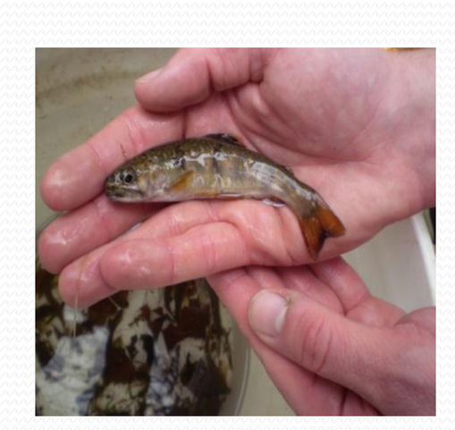
Sculpin CPUE
No Change


Trout CPUE
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Sculpin CPUE
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Trout CPUE
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Trout CPUE
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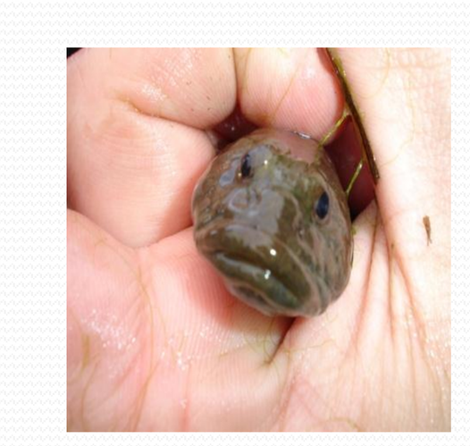
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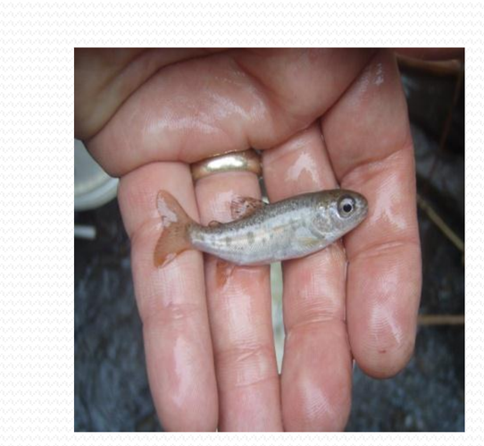
Trout CPUE
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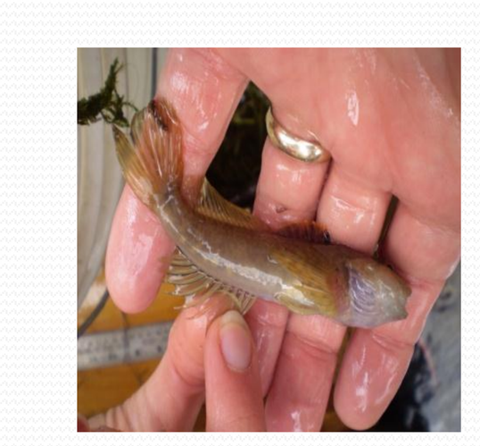
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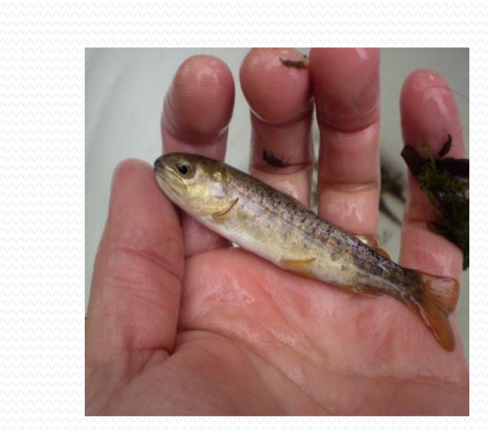
Trout CPUE
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Sculpin CPUE
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Trout CPUE
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Conclusions

- Line and Little Schoharie Creeks were heavily channelized (>2 miles and >5.3miles respectively). Alkalinity was very low at all sites (<100 mg/L).
- Turbidity was high (>7 NTU increase post-flood) in downstream altered reaches of the Line, Keyserkill, Little Schoharie & Platterkill.
- Flood effects on the physical habitat increased in downstream reaches.
- Despite the flooding and habitat alteration, trout were found in all 8 streams, even in heavily channelized reaches.
- Trout (wild brook, brown & rainbow) CPUE increased or remained the same in reaches that were relatively unaltered by the flood or flood reparations (5 of 6 unaltered reaches) and decreased in 1 of 6 unaltered reaches.
- Trout CPUE decreased in 5 of 8 altered stream reaches and remained the same or increased in 3 of 8 altered reaches.
- Slimy sculpin, an indicator of excellent water quality, were historically found in 4 of 8 streams.
- Post-flood sculpin CPUE was reduced in lower, heavily altered reaches of the Line and Little Schoharie Creeks (Little Schoharie decrease= 124 fish/hr in 2005 to 0 fish/hr in 2012).
- Creeks in which post flood alteration occurred showed higher turbidity levels than those creeks that were relatively unaltered.

View from the top of Vroman's Nose,Town of Middleburgh, Schoharie County

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- Photos courtesy of Pete Nichols, Mark Cornwell, Indie Bach &Amy Colyer Fogerty.

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