

Published on *AWN | Animation World Network* (<http://www.awn.com>)

# Mr. X Builds a Hot Tub Time Machine

■

By *bdesowitz*

Created 03/31/2010 - 14:42

[Check out the Hot Tub Time Machine clips and trailers at AWNTv!](#) <sup>[1]</sup>



**The time machine is a weird concoction of a Chernobyl-like Russian energy drink, a touch of Vodka and a mystical force. All images courtesy of MGM and Mr. X.**

In *Hot Tub Time Machine*, starring John Cusack, four friends on a road trip end up traveling back to the '80s in a bizarre water vortex. Mr. X of Toronto provided 120 shots comprising full CG environment support. The team was led by [Dennis Berardi](#), <sup>[2]</sup> VFX supervisor; Mike Borrett, production manager; Tamara Stone, compositing supervisor; and Kyle Yoneda, CG supervisor. Mr. X Founder Berardi provides an inside look at the unusual time machine.

**Bill Desowitz:** *So what was it like working on this comedic romp?*

**Dennis Berardi:** First of all, working with director Steve Pink keeps you on your toes. He's very smart and very quick comedically and the kind of vibe he set initially was trying to have fun. It's not often you come out of a shot review completely broken up with laughter. But the shots were pretty challenging. We did a bunch of environment work, where the story ultimately takes us to a ski lodge, which is run down today, but was in its heyday in the '80s. So we had a lot of environment work taking the location and dressing it down to look like a derelict town. We added graffiti, dirt and decay to the buildings, breaking pieces of things off and adding 50 gallon drums that were on fire, adding tarpaulins over stuff and generally trying to make the ski town

and the lodge look like no one had kept it up for 20 years. We also did some environment extensions for the actual ski lodge itself where there is a prominent rooftop area that never existed, so we created the top of the structure. We also shot the actors against greenscreen for some skiing and did some plate photography and composited the two. And in some cases because of the perspective change in the specific performance we couldn't match an exact plate to the camera motion so we did full-CG slope for the background.

We also had fun with a little squirrel that plays prominently and so in most cases he was a little greenscreen element that got composited and integrated into the shot. Basically, he was a puppet squirrel with CG facial enhancements, where we did some work on the eyes and nose area to make it look like he was emoting. But quick, little moments -- nothing big.



**Mr. X used Realfow simulations of water that were rendered in Houdini and custom tools to render 50 million-plus particles of spray and splashes.**

**BD:** *But obviously the biggest and most complex effect was the Hot Tub Time Machine. How did you design and execute the water simulation?*

**DB:** In the story, it's this weird concoction of a Chernobyl-like Russian energy drink and a little bit of Vodka and then a mystical force that transforms this hot tub into a time machine. What happens is the water starts to swirl around and swirl around and swirl around and our characters get taken under the surface of the water and then a huge water vortex shoots up into the sky and then it all crashes back to earth and then we travel through time through this crazy vortex of energy and water. And 90% of our effort went into those 15 shots because we had to do a pretty complicated water simulation with high level shader work and physics to make it look real and be also fun and violent, which is what Steve was looking for.

**BD:** *What was your solution?*

**DB:** We had one of our internal comp artists here mock up a style frame for Steve, but we did it as a still just to get sign off on the structure of the thing. It ended up being a very tall water column, which was about 10-feet wide at the thinnest and maybe 30-feet wide at the widest in diameter, if you will, and literally went into the clouds, but had varying levels of turbulence and

also had an internal illumination quality to help sell the fact that it had not only had a naturalistic force but also a mystical force.

**BD:** *How did you accomplish this?*

**DB:** We started with a sketch and Steve said bigger, taller and we showed him a color rendering and started to lock the look in on the level of a still, and then we started doing motion tests and took it into [Houdini](#) [3]. To create the CG water vortex, our FX team used [Realflow](#) [4] simulations of water that were rendered in Houdini with Mantra. Custom tools were built by the team to render 50 million- plus particles in a scene of spray and splashes [composed in [Nuke](#) [5]]. But also the water vortex had to interact with the clouds as it shoots up into the sky.



**Plus the water vortex shot up into the sky and interacted with cloud systems.**

**BD:** *What about the interaction with the actors?*

**DB:** That was a big challenge because Steve also wanted to see the four actors in the vortex, so we came up with a hybrid of 2D and 3D where we either composited the guys in or projected them onto the surfaces and did a bit of a 2.5D approach. And there were all kinds of secondary elements: water droplets and snow and various bits of debris that get sucked up -- paper and small props from around the hot tub that added a sense of motion and scale. Because, as you know, water is tough to deal with in scale if you don't have anything next to it to help you figure out what size it is. That was one of the challenges because in our early works everything felt [too] miniature. We were in real world space in the software and we knew it was like 50 stories tall but when you rendered it, it looked like it was three-feet tall. So we scaled down the internal features of it, played with different camera angles and lensing a lot to get a sense of scale, and then, as we started to add smaller supporting items, we started to have those visual cues where it started to work: "Oh, yeah, that does feel big."

And that's when Steve started really liking it. It probably took us about six months to really develop the look of the hot tub water. It was all CG, but we first shot some practical elements on set just to see what water would do in the hot tub. And the effects guys came up with this little swirling mechanism, paddle-rigged, that swirled the water around in there for us, so we got a

sense of what water would do in that confined space at the speeds we were going, but we realized that it helped to some degree, but Steve wanted us to take liberties with it and really amp it up and go about 1,000 times faster than the swirling water we shot for reference. So we were playing with such a fantastical concept that the live-action plates that we shot for reference didn't really help us much.

**BD:** *Anything else?*

**DB:** The only other thing of significance was there was a scene where one of the guys was juggling chainsaws and they are CG. They're actually live chainsaws in the movie with snow coming off of them and it was fun. So that's one of our shots.

*Bill Desowitz is senior editor of AWN & VFXWorld.*

**Source URL:** <http://www.awn.com/articles/article/mr-x-builds-hot-tub-time-machine>

**Links:**

- [1] <http://www.awntv.com/playlist/hot-tub-time-machine-playlist>
- [2] <http://www.awn.com/articles/visual-effects/recreating-antarctica-iwhiteout>
- [3] <http://www.awn.com/articles/review/houdini-10-review-getting-motion-fx>
- [4] <http://www.awn.com/articles/tutorials/imaya-plugin-poweri-wakes-loch-ness>
- [5] <http://www.awn.com/news/technology/genarts-foundry-collaborate-enhance-nuke>