

The RiverWebs film project



How valuable are human stories in communicating science?

How can media producers access human stories in science?

**Preliminary Evaluation Report
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Freshwaters Illustrated
Corvallis, Oregon
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www.riverwebs.org

Executive summary

What is RiverWebs?

- RiverWebs is an educational documentary film about river food webs and recent pioneering research that has explored their relationships to forest food webs, produced for PBS broadcast and DVD distribution
- RiverWebs uses a dramatic true story shared by several ecologists to engage viewers in the life and science of river ecosystems, and in the scientific process itself
- RiverWebs used a filmmaking approach that was very collaborative with scientists and included complete transparency, cooperative development, and a content standards and accuracy committee to engage scientists more deeply in the film

What has RiverWebs achieved?

- RiverWebs has been broadcast to nearly 100 million U.S. homes
- Nearly 2000 DVDs have been distributed
- Classroom and Japanese versions of RiverWebs are in production

What has RiverWebs contributed?

- Surveys of RiverWebs audiences indicate:
 - The film has high educational and entertainment value
 - A human story can provide an enriched context to learn about scientific knowledge and methods
- Surveys of RiverWebs cooperating scientists indicate:
 - Scientists are generally wary of sharing information with media agents, and most have had negative prior experiences with media agents
 - Our collaborative filmmaking approach eased scientist concerns, and encouraged scientists to share more with our project than they otherwise would have
 - All surveyed scientists had a positive experience participating in the film

Project summary & origin

RiverWebs is a feature length documentary film produced by Freshwaters Illustrated to communicate the nature of stream food webs and the recent pioneering research that has

RiverWebs

A film about life, death, science, and streams

Produced by:

Freshwaters Illustrated

In partnership with

Colorado State University

Running Time: 56 minutes

Format: SD 16:9, Mastered to HD

Broadcast: PBS broadcasts 2009-2013; distributed through NETA

Home video: Documentary DVD

Website: www.riverwebs.org

demonstrated their surprisingly strong connections to food webs (Nakano et al, 1999, Baxter et al. 2005).

As a narrative approach, the film uses a dramatic true story shared by the international community of ecologists who conducted this pioneering research, and whose spirited leader was killed at the height of his career in a tragic research accident in 2000. This approach was chosen as a way to communicate the personal passions and relationships that commonly drive science, and as a way to broaden the film's audience beyond science and natural history.

The RiverWebs project began in 2003 with initial meetings between key scientists and the film's Producer/Director, who had pitched the idea of packaging the research results in a personal and

biographical story of the scientists. After positive discussion, the Producer and lead scientist collaboratively pursued grant funding and received awards through the National Science Foundation – Informal Science Education (Communicating Research to Public Audiences program), the Fisheries Conservation Foundation, The Japan-U.S. Friendship Commission, the U.S. Forest Service, and the Environmental Protection Agency. Production began in 2005, with 8 months of location filming in Japan and the Western U.S. Production was followed by 24 months of postproduction. The film premiered in June 2007, and the documentary DVD was made available in January 2008. National PBS broadcasts began in November 2008.

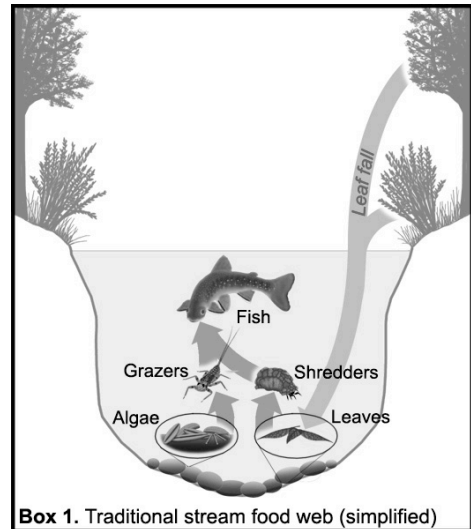
Science education goals

For many, RiverWebs is their first look at rivers as ecosystems, and so an overarching educational goal was to illustrate their biological vibrancy and diversity. More ambitiously, RiverWebs sequentially builds a simple stream food web up to an interconnected stream-forest food web that changes with species interactions and with human influences on species composition and habitat.

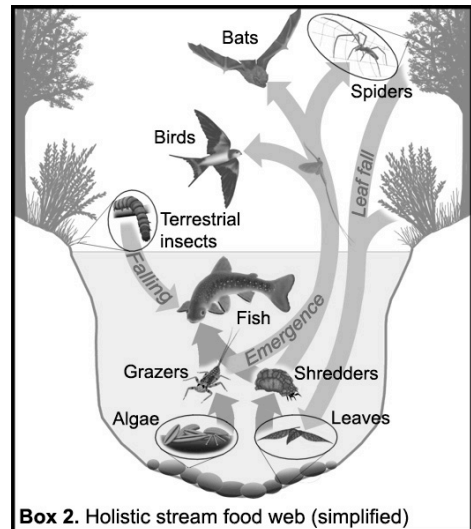
In terms of science content, RiverWebs is unique in that there have been very few films and videos examining temperate river food webs in a general sense. While freshwater ecosystems and biodiversity are underrepresented in images and media (Monroe et al. 2009), freshwater issues are increasingly central in conservation and ecological contexts (Dudgeon et al 2006), their fauna are among the most diverse and imperiled on earth (WWF 2008), and there is a growing movement of grass roots and non-governmental organizations focused on the conservation of rivers, lakes, and wetlands. Freshwaters Illustrated was founded on this need for more imagery and stories, and RiverWebs is FI's first feature film.

Our specific educational goals were to:

- **Illustrate the biological diversity and organization of the generalized stream food web** (see Box 1)
- **Illustrate how organism behaviors and competition can determine their food web relationships**
- **Illustrate the distinct scientific approaches of observation and experimentation, and their utility in finding correlative and establishing causal relationships**
- **Illustrate the recently discovered food web connections between streams and forests** (see Box 2)
- **Illustrate the impacts of both invasive species and streamside forest destruction on interconnected stream-forest food webs**



Box 1. Traditional stream food web (simplified)



Box 2. Holistic stream food web (simplified)

Tapping the power of a human story

Unique to the RiverWebs project is a premeditated attempt to share the dramatic lives and personal experiences of a small community of scientists, and the tragic death of their visionary leader, Dr. Shigeru Nakano. Nakano's humble beginnings, meteoric rise, and the heroic circumstances of his death contribute to an almost archetypal personal story. Perhaps more powerfully, the impact of Nakano's death on his colleagues and their recovery provide an inspiring example of how the human sense of hope, commitment, and perseverance can survive the worst of tragedies. Of course, this rich human story takes place in the context of a dedicated group of high-profile scientists who have helped to redefine the scientific understanding of river ecosystems. Indeed, **personal passions, relationships, successes, and tragedies are no less a part of scientific careers as they are of any other lifestyle or career, yet public audiences rarely see this part of science.** It would seem that there is mutual agreement between scientists and media that the primary contribution of scientists is their knowledge and results.... but by leaving out the humanity of science, are we losing some of the appeal and process of science?

Accessing personal scientific stories through collaborative filmmaking

In order to authentically and accurately share the human story that we hoped would deepen our impact and broaden our audience, we anticipated that we would need a more sensitive filmmaking approach that would share some ownership between scientists and

filmmakers. Many scientists seem naturally wary of media and journalists, and as one of our cooperating scientists put it, “we’re scientists, all we have is our reputation”. **Since we were proposing a documentary film that would explore the personal life and death of a recently deceased scientist, there was reason to anticipate heightened concerns and reservations from scientists who we hoped to involve**, several of whom are distinguished in the ecological community. We knew that we needed to keep the scientists comfortable, trusting, and confident in our filmmaking approach, even if it meant giving up some narrative control.

Our collaborative model to work with scientists included the following key elements, designed to engage them in the process and narrative approach, prepare them to share both their research and their personal stories, and to ease any concerns of misrepresentation.

Collaborative Development, which engaged scientists in the development, fundraising, and production process. This was achieved through email communication and meetings.

Transparency, which provided scientists with opportunities to review proposals, treatments, scripts, rough cuts, and production plans

Scientific Standards & Accuracy Committee, which included key cooperating scientists and the films Producer/Director, to review and democratically approve accuracy and authenticity of final scripts and rough cuts. This committee held collective veto power over the films content.

Distribution Progress

To date (December 2010), RiverWebs has been broadcast nationwide on PBS through NETA, and will continue broadcasting through 2012. **Carriage tracking indicates that we have accessed over 96 million households in nearly 40 states in 2009 and 2010, including large PBS markets like New York, Los Angeles, Philadelphia, San Francisco, and Chicago** (TRAC Media).

Nearly 2000 DVDs of the PBS RiverWebs version have been distributed, primarily to college, high school, and natural history/watershed educators.

RiverWebs has screened in several environmental and general interest film festivals, including the DC Environmental Film Festival, the Hazel Wolf Environmental Film Festival, Da Vinci Film Festival, Estes Park Film Festival, and Earthvision film festival.

A 6-12 classroom version of RiverWebs is currently being produced, which is designed and promoted for the educational community (supported by NSF). Production of this version is being guided by a teacher advisory committee.

A Japanese version of RiverWebs is currently being produced, which will be designed and promoted for Japanese schools and museums. This version is being guided by a Japanese teacher & scientist advisory committee.

Preliminary Evaluation Results

RiverWebs was produced on a relatively low budget that was less than anticipated, and so our evaluation efforts proceeded in an earnest, albeit scaled down, capacity, and we were not able to hire an external evaluator.

Formative evaluation

During production, we held several focus groups with documentary and feature film professionals to help fine tune the balance and interplay between human story and scientific content. **Focus groups helped us recognize and address the following issues:**

- *Lengthy science sequences (over 5 minutes) tended to lose audience interest*
- *Interspersing science sequences more frequently and in shorter segments helped the film's rhythm and progression*
- *Even after liberal editing, scientists own descriptions of their research were generally too long and too detailed to keep audience interest, however their personal statements regarding the human story were most poignant and meaningful.*
- *Natural history footage alone was not sufficient to illustrate food web relationships; graphic animations were needed to communicate the organization of relationships*
- *Scripted narration would best describe research and results, and could better complement graphic animations*

Evaluating audience impact

To date we have conducted audience surveys at 3 community screenings. Two of these screenings took place on university campuses, and all three were hosted by environmental groups and held as evening events and promoted across campus and to the non-academic communities. All screenings used the survey sheet in Appendix A.

In all 3 screenings, audiences gave generally high rankings to the entertainment and educational value of the film, with slightly higher rankings to the entertainment value (see table below). Most striking was the nearly unanimous affirmation that the human story (Nakano's biography) was an engaging way to learn about stream food web ecology.

Event/host	Audience size (surveys completed)	Entertainment value (mean; scale: 1-10)	Educational value (mean; scale: 1-10)	Value of human story in learning science
Northern Michigan Univ. – screened as part of the Environmental Film Festival	60 / 46	8.35	8.20	96% affirmative
Univ. of Washington – hosted by the UW Program on the Environment	35 / 33	7.82	7.71	97% affirmative
Corvallis, Oregon – hosted by the Reviving Biodiversity in Corvallis series	60 / 28	9.07	9.14	100% affirmative

While these results are preliminary and somewhat cursory, they appear to affirm our hope that a human story would resonate with audiences and perhaps deepen the impact of science media. We plan future audience surveys, and will seek opportunities to gather feedback from more general film audiences.

Evaluating our filmmaking approach

We used an anonymous online survey to gather feedback from our participating American and Japanese scientists. Of the 16 scientists involved in the project (6 American, 10 Japanese), 6 responded to our survey (3 American, 3 Japanese).

Prior media experiences

- **80% of respondents have had a negative experience with a press/media agent.**
Examples of negative experiences were:
 - *“Extreme emphasis on one of the speculations (making their story). Sometimes leading questions.”*
 - *“Often times the story doesn't reflect what we discussed in the interview, although some are very accurate.”*
 - *“In at least one case, I was not able/allowed to proof a newspaper article that then mis-quoted me and/or quoted me out of context.”*
 - *“A newspaper writer wrote an article that was not what I meant to say.”*
- **75% of respondents cited accuracy as a primary concern when communicating science to press/media agents**

Collaborative model

- **100% of respondents were happy with the RiverWebs film, and had a positive experience participating in the project**

- **75% of respondents felt that our collaborative model helped ease concerns**
- **100% of respondents stated that our collaborative approach encouraged them to share more in interviews than they otherwise would have**
 - 50% felt the most critical element was Collaborative Development: engaging scientists in the development, fundraising, and production processes
 - 25% felt the most critical element was Transparency: the ability to review proposals, treatments, scripts, rough cuts, production plans
 - 25% felt the most critical element was the Standards and Accuracy Committee, which involved key cooperating scientists in the review and approval of the script/films accuracy and authenticity

Our survey results suggest that scientists are generally concerned about engaging with media, which may be due to past negative experiences they have had. **These results support our collaborative filmmaking approach, and indicate that we may not have been able to gather the deeper personal stories from our scientists without this approach.**

Beyond our survey results, we have received nothing but praise and thanks from the scientists we worked with throughout this project. Many have expressed how rewarding it was to collaborate more deeply and learn about the process of filmmaking and science communication. Likewise, our filmmaking experience was greatly enriched by the open communication, honesty, and altruistic collaboration we experienced. While we received many narrative ideas and content clarifications, it is worth noting that **our Standards & Accuracy Committee never once deliberated or voted on a content issue... and therefore never exercised their collective veto power.** This speaks to a successful collaboration between the project's scientists and filmmakers, and suggests that our model may be useful in other media projects communicating research and the personal lives of scientists.

References

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Appendix A – Audience survey

Do you have a background in aquatic science or conservation? Y N
If yes, please describe _____

What was the main message of RiverWebs? _____

On a scale of 1 to 10 (10 being the highest), how entertaining did you find RiverWebs?

1 2 3 4 5 6 7 8 9 10

On a scale of 1 to 10 (10 being the highest), how educational did you find RiverWebs?

1 2 3 4 5 6 7 8 9 10

Did you find the story of Shigeru Nakano to be an engaging means to learn about river food web ecology? Y N

What was the most interesting thing you learned in RiverWebs?

What part of RiverWebs do you like least? _____