

# How To Get Cli-Fi To Hit the Mark

*Analysis and synthesis of the academic literature on climate change film narratives*

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## 1. CLIMATE CHANGE IN THE MOVIES

The chilling scene shows a massive glacier breaking apart into millions of fragmented pieces. There is a thunderous, deafening echo as chunks of ice tumble into the freezing water 300 feet below. While this sounds like something straight out of a disaster movie, it's actually very real. This rare footage was captured in the 2013 documentary, *Chasing Ice*, which shows the largest glacier calving event ever caught on film. The scene has all the makings of a fiction movie; action, suspense, incredible cinematography. But, it is, indeed, a documentary calling attention to the world's changing glaciers as a result of climate change.

Movies have a great opportunity to engage audiences on the issue of climate change, from informing people, all the way through to motivating action and encouraging behavior to act on the issue (Howell, 2014a). Movies tell stories that are close to people's hearts and minds; they activate our brains and capture our attention through a multi-sensory experience (sight, sound, emotion), and the ones that really get to you, stay with you long after the (digital) film reel has run out. Despite a number of films created based on climate change stories and issues, and increasing interest in the role of film to illuminate the issue, for example within programs like Film4Climate at the World Bank, there is relatively little analysis on the role of film for climate change communication, and especially on the impact of climate-related films on behavior change.

*So, what is the formula for making a film that is both compelling and useful in creating behavior change to take on climate change?*

Although directors may be taking a risk in broaching the climate subject (audiences perceive a fine line between heavy-handed messages and being so vague that the message is completely lost), approaching climate change through climate-fiction, or dramatic, emotionally engaging documentaries, may help reach millions of people who would not ordinarily follow the climate agenda.

This article draws on analytical concepts from both academic research and popular media coverage of climate change-related films, and their possible impact on behavior change and climate change action. The objective of this work is to inform our understanding of how film can communicate climate change so that filmmakers can make better decisions about how climate change issues and solutions can be incorporated into their work.

## 2. CLIMATE MOVIES AND THE RISE OF CLI-FI

Climate change related documentaries and fiction movies have seen a big increase in production in recent years. Al Gore's *An Inconvenient Truth* (2006) set the scene for motion pictures on the climate change topic, winning two academy awards, including Best Documentary Feature.

More recently, documentaries have taken the climate change issue to new heights with features on climate activism (e.g. *Just Do It*, 2011; *An Inconvenient Youth*, 2015), the industrial-political complex and levels of consumption that keep emissions growing (e.g. *Everything's Cool*, 2007; *Carbon Nation*, 2010; *Disruption* 2014; *Merchants of Doubt*, 2014; *Switch*, 2012), and the impacts on people and the planet with visual imagery and harrowing stories of survival (e.g. *The Island President*, 2011; *Years of Living Dangerously*, 2014; *Antarctic Edge: 70° South*, 2015; *This Changes Everything*; 2015). The involvement of celebrities has also pushed the climate agenda on film forward, including high-profile work from Leonardo DiCaprio in *The 11<sup>th</sup> Hour* (2007), Pamela Anderson in *Meat the Truth* (2008), and a host of A-List celebrities showcasing, in dramatic fashion, the impacts of climate change, including war, fire, flood, and drought in *The Years of Living Dangerously* (2014).

What is interesting, however, is that the line between reality and fiction has become more blurred with the surge of films blending climate change and fiction, potentially bringing in audiences that, ordinarily, would not watch a 'climate change documentary'. The emergence of this new subgenre of film is called Climate-Fiction, or *Cli-Fi*, and describes movies (and novels) that focus on climate change and global warming issues alongside fictional narratives. Cli-fi may not be as issue-specific as documentaries are, but it may be a very important tool for communicating climate change and encouraging people to act precisely because it is not pitched to audiences as a documentary about climate change.

Similar to non-fiction, or *faction*, novels, cli-fi films aim to ground themselves in fact-based reality, such as the science and solutions, but elaborate the story with characters and storylines of fiction. There are several reasons why cli-fi has caught on so quickly. Increasing daily coverage of climate change news stories in the media, the growing global coverage of cli-fi movies in popular magazines, such as *TIME*, and the actual impacts of climate change being felt around the world, has helped open up the sub-genre. In addition, the popularity of movies like *Interstellar*, which has a strong, but understated, cli-fi theme, and films like *Godzilla*, *Snowpiercer* and *Into the Storm*, which use environmental destruction to "raise the stakes" for the audience, have had high box office successes<sup>1</sup>.

The level of scientific accuracy in these films, however, is not always clear. For example, *The Day After Tomorrow* includes the idea that a tipping point in ice cap melting could cause certain ocean currents to stop, abruptly throwing the world into an ice age over a number of days. This is not supported by the mainstream climate science, but does give rise to a dramatic disaster movie. Other films use personal stories of individuals affected by climate change, and show how cross-cultural issues can create emotional and comedic interactions, for example, in *Chloe and Theo*. Other films, such as *Interstellar*, cover the climate change problem without specifically naming the issue. People stormed the theaters to watch box office hits like *The Day After Tomorrow* and *Interstellar* because they were blockbuster films, not because people were interested in the climate message (Reusswig and Leiserowitz, 2005). When it comes to mainstream entertainment, cli-fi blockbusters make a lot more money at the box office compared to documentaries (see list of climate change films in references). This means there is a great opportunity for filmmakers to take the climate change message to mainstream audiences. So how do we do this effectively?

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<sup>1</sup> *TIME Magazine*, 2014. *Godzilla*, *Into the Storm* and More Summer Cli-Fi Thrillers. May 19.

### 3. WHAT DO WE NEED TO CONSIDER WHEN MAKING FILMS ABOUT CLIMATE CHANGE GEARED TOWARD BEHAVIOR CHANGE?

Efforts have been made to investigate the impact of climate change films on viewers' attitudes and (occasionally) behavior (Howell, 2014b; Scannell and Gifford, 2013). Academic research, however, has largely focused on a few select movies (Balmford et al., 2004; Beattie, 2011; Beattie et al., 2011; Howell, 2011; Lowe et al., 2006; Nolan, 2010; Reusswig and Leiserowitz, 2005; Reusswig et al., 2004; Sakellari, 2014).

These studies give a mixed picture: the films generally raise concern about climate change, and often promote motivation to act or even behavioral intentions (e.g. Beattie et al., 2011). They also tend to take large sweeping views on environmental change (using iconic imagery and camera angles) and juxtapose this with close-proximity human stories, which are useful for engaging the immediacy of concern (Hammond and Breton, 2014).

The effect on behavior over time, however, is not so clear given the difficulty in obtaining data and the complex nature of causal factors other than film in people's decision-making patterns. So, then, what are the key things we need to consider when making films about climate change?

#### *Why is film important?*

Film offers a number of advantages as a means of promoting climate change action to individuals. Visual images can convey messages instantly in a way that makes them memorable (Nicholson-Cole, 2005). Movies, in particular, have immediacy and include characters that the audience can identify with, and receive information from, as if those people were connecting with them personally. However, communicating information by itself is not enough to motivate action. Movies can appeal to people's emotions; they are well-placed to bring people into the issue through multiple, concurrent techniques such as the use of imagery, music, and sound effects (Pooley and O'Connor, 2000). Several communication studies, therefore, point out that communicators of climate change should aim to achieve meaningful engagement in understanding, emotion, and behavior, in order to gain people's support, and give them tangible ideas for action (Ockwell et al., 2009).

#### *Can we change behavior with films?*

How film influences attitude and behavioral change is still a complex and little understood phenomenon. In cli-fi, there is a spectrum of implicit and explicit aims for behavioral change, ranging from overt coverage of personal actions, for example, in *The Age of Stupid* (reducing emissions) and *Take Shelter* (preparing for severe weather), through to evacuation of the planet and terraforming elsewhere, for example, in *Interstellar* (although climate change is not explicitly mentioned).

Very little exists in the popular or academic literature, however, to suggest that climate change films create behavior change. Researchers in Australia indicated that Australians who had seen *An Inconvenient Truth* were significantly more likely to report reducing their use of motorized vehicles or electricity than non-viewers. However, the study indicated correlation rather than causation, with people likely already undertaking these actions (Akter and Bennett, 2011). Others have also shown that behavior change based on watching climate films tails off quickly (Howell, 2011).

Psychology theory, however, has shown that film can be a great communicator of issues, solutions, and action in other areas, such as healthy behavior, which could work well for climate change communications.

### *What does psychology theory tell us about changing behavior with film?*

A number of different theories exist to try and understand the role of film in creating attitudinal and behavioral change. Documentaries often aim to show a specific point of view in order to encourage action or behavior change from the audience. This is less obvious in dramatic film, where the storylines, characters, and 'enjoyment factor' of the film tend to take precedence. This is not to say, however, that fiction, or faction, films do not influence audience attitudes and behaviors.

Studies have shown that for communication to be effective in terms of raising awareness and promoting active engagement, providing more or better information is not enough (Nerlich et al., 2010). From a psychological perspective, including targeted messages in storylines moves beyond the 'information deficit model' (which assumes people are empty vessels waiting for information on which to rationally act). Instead, reaching people at an emotional level through the exploration of bottom-up, non-expert characters, rather than top-down expert opinions, is more effective.

For example, 'social cognitive theory' posits that an important way people learn is through observing others' attitudes, behavior, and the outcomes of that behavior (Bandura, 2004). In this way, easily identifiable characters can model desirable behaviors, which increase viewers' belief that they can also adopt the behaviors. These characters can also foster cognitive skills regarding those behaviors; they can motivate and positively reinforce action through depicting rewards for desirable behaviors and punishments for those that are undesirable (Howell, 2014a).

This approach is often used for Entertainment Education (EE), such as soap operas, comedies, and dramas, which has been shown to be effective in changing attitudes and behavior for HIV prevention, mental illness, family planning, and domestic violence (Singhal and Rogers, 2012). A key format of EE is the use of narratives, which enable engagement without triggering the audience to reject the message, and even use of celebrities to pull in audiences (Brown et al., 2004). *Enjoyment of the story* and *identification with the characters* reduces avoidance of the message (i.e. 'turning people off'), which is particularly problematic for difficult or overtly persuasive messages (Moyer-Gusé, 2008).

Although social cognitive theory has been shown to influence attitudes toward an issue, eliciting actual behavior change is more complex. Howell (2014a) puts forward the theory of a 'transtheoretical model' (TTM) of behavior change, based on health psychology, which considers behavior change in stages with participants moving between stages (although, in reality, this is more of a continuum rather than being linear). The model begins with people gaining an understanding of the issues, and moves through several stages to realize full behavior change. Indeed, TTM suggests that because films use emotional content, they are able to capture people's imagination and interest at early stages, creating understanding of the climate change issue from the outset.

In Howell's (2014a) analysis, she finds, however, that both drama and documentaries are able to create awareness and emotional engagement through consciousness-raising and dramatic relief. Films are good for consciousness-raising because of their ability to convey new information and complex ideas quickly and memorably (Nicholson-Cole, 2005). However, a key component of TTM is the pivotal process that occurs between thinking about change and actually making change (so-called 'self-liberation'). Therefore, filmmakers keen to stimulate action through behavior change in the audience may need to portray the processes that help to support and maintain behavioral change (such as practical actions people can take). This, in combination with a dramatic context that brings people in emotionally, could be a successful formula for engagement (Moser and Dilling, 2011, 2004). Not an easy task on the face of it.

### *What messages should be presented to create incentives for people to take action?*

Catastrophe and disaster are common themes in climate discourses and media portrayals (O'Neill and Hulme, 2009), and some suggest that we still may need a “useful catastrophe or two” to “illuminate the issues” (Tickell, 2002, p. 737). Although many climate-related films have focused on the ‘catastrophe’ aspect of climate change (e.g. *The Day After Tomorrow*), research has shown that this approach may have quite the opposite effect to what was intended; fear can undermine the belief that there is an opportunity for individuals to make a difference (O'Neill and Nicholson-Cole, 2009). Fear, and depersonalizing the problem by focusing solely on scientific facts, may also provoke defensive responses (Lowe et al., 2006; Moser, 2010). Others note that a fear appeal should be used only if a credible way out of the problem is also presented (Futerra, 2005).

As a result, more positive framings of climate change solutions in movies can help promote positive attitudes towards action. Communications about climate change should explain or show what people can do to mitigate the problem (Lorenzoni et al., 2006; Moser and Dilling, 2004). A positive framing of action against climate change, rather than focusing on what will be lost if we do not act, may encourage more positive attitudes towards action (Spence and Pidgeon, 2010).

Overtly positive framings, however, may also create communication challenges. The Disney film, *Tomorrowland*, flopped at the cinema with low box office earnings, despite an A-list leading actor and director. *The Washington Times* noted that even with a well-intentioned global warming message, the low ratings could be a result of being overly “preachy,” “smug” and “proselytizing”, as some critics, reported.<sup>2</sup> Clearly, a balance between unrealistic utopian visions, disaster-ridden action, and practical options for taking steps toward climate action is needed in the cli-fi space.

### *Audience segmentation and perceptions*

Engaging with a range of audience members is important to enable maximum effect and impact of a film. A range of characters in a film means that a range of people in the audience may be able to identify with storylines and messages, especially where characters hold more ‘extreme’ views and/or do not conform to social norms. For example, in the documentary, *Just do It*, protesters seemed not to have full time jobs, and may, therefore, not resonate with the majority of mainstream viewers who view employment as an integral part of their lives (Howell 2011, Lander 2012).

The narrative in films about *who* should take action is also important. In *The Day After Tomorrow*, it is scientists convincing politicians to take action; there is no narrative to suggest individual actions are also important. This has been shown to strengthen people’s attitudes that government should take a leadership role (Reusswig et al., 2004), leading to an increase of shifting responsibility for action, from oneself onto others (Beattie et al., 2011). As Sakellari (2014) notes, cinematic climate change does not have persistent persuasive effects because the films tend to miss the point of the individual as a responsible agent of change.

Celebrities also play a potentially important role in raising the agenda of climate change. In addition to being a significant draw for people to watch films, they have been shown to mobilize people and raise awareness in climate change efforts (Anderson, 2011). Although celebrities may enlist a new fan base into climate change action, they also run the risk of marginalizing some who view them as ‘Hollywood elites’ or as trivializing the issue (Boykoff et al., 2010; Boykoff and Goodman, 2009). Despite these potential pitfalls, the championing of climate messages may be precisely what is needed in order to activate and mobilize the

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<sup>2</sup> <http://www.washingtontimes.com/news/2015/jun/17/george-clooneys-tomorrowland-bombs-at-box-office-a/?page=all>

individual consumer-citizen into action on climate change (Boykoff et al., 2010), and fits particularly well with the opportunities afforded by mainstream Hollywood movies.

#### 4. THEMES OF FILMS THAT INCLUDE CLIMATE CHANGE MESSAGES

##### *The Climate-related Apocalypse*

Films that include post apocalyptic themes like widespread drought, famine and loss of species have become increasingly popular in Hollywood. Perhaps the words ‘climate change’ are not specifically uttered in the film, but there is an obvious subtext.

These films build on the impacts of climate change that are happening now, portraying the food and water shortages threatening billions, for example, in *Autómata* and *Young Ones*, “...when it's science fiction, the unforgiving landscape of the future instantly taps into human fears and is a powerful storytelling device.”<sup>3</sup> Similarly, the apocalyptic theme of *Interstellar*, while extreme, was in many ways prophetic given a UN report on the destruction of farmland across the globe due to poor drainage and heavy irrigation leading to contamination.<sup>4</sup>

Drought and famine also play a prominent role in *The Hunger Games* and *Divergent*, as dystopian films driving home the ‘societal repercussions of disaster’ message. Journalists have commented that the reason these films are so popular right now is because the issues they incorporate are so relevant and tap into people’s current cultural anxieties.<sup>5</sup>

Set 45 years in the future, the post-apocalypse is in full swing in *Mad Max: Fury Road*, with critical shortages of water and fuel – an undercurrent of the impacts of global warming and peak oil – and a cruel dictator who controls what resources are left. The film’s leading actress, Charlize Theron, said that the film, “felt very grounded in real events. The idea of globalization and global warming and drought and the value of water, and leadership becoming completely out of hand.”<sup>6</sup>

Filmmakers are also no longer depicting climate change as the cause of future destruction, but are showing the reality of its affects on people and their daily lives, right now. For example, in *Beasts of the Southern Wild*, a Louisiana community must face a major storm, and deal with its aftermath. Similarly, in *Take Shelter*, a man becomes obsessed with building a storm shelter after experiencing visions of deadly storms. As the Guardian notes, *Take Shelter*, “signals how climate change has become our equivalent to the mid-20th century nuclear scare”.<sup>7</sup> As a result, we can see that climate films don’t (and shouldn’t) have to focus solely on the future. Current actions and behaviors to deal with climate impacts can be the seed for the human story to be told.

##### *Cli-Fi: To Be or Not to Be (or Does it Really Matter)?*

As the cli-fi subgenre gains increasing attention from Hollywood, there is ongoing debate over which films really are cli-fi and which ones are not. For example, *Interstellar* was argued by some as cli-fi for portraying an unviable biosphere on Earth, due to severe weather conditions, soil erosion, and food shortages.

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<sup>3</sup> *USA Today*, 2014 <http://www.usatoday.com/story/life/movies/2014/10/08/drought-movies-insterstellar-/15092955/>

<sup>4</sup> *The Independent*, 2014 <http://www.independent.co.uk/environment/un-report-climate-change-has-permanently-ruined-farmland-the-size-of-france-9831876.html>

<sup>5</sup> *The Guardian*, 2015. <http://www.theguardian.com/childrens-books-site/2015/apr/20/climate-change-reality-dystopian-fiction>

<sup>6</sup> *The Guardian*, 2015, <http://www.theguardian.com/film/2015/may/14/charlize-theron-mad-max-landscape-awaits-unless-we-tackle-climate-change>

<sup>7</sup> *The Guardian*, 2014, <http://www.theguardian.com/film/2014/sep/21/inconvenient-truth-evolution-climate-change-film>

Some journalists have noted that *Interstellar* takes a post-climate change angle, and that, for star Michael Caine, being part of the film convinced him that climate change is real.<sup>8</sup> Others note, however, that despite the widely held view that *Interstellar* is about climate change, it fails in its attempt to get the climate change message across about solutions. As some have said, Hollywood continues to get the environment message wrong, because “the dangers of doing nothing are horrifyingly cinematic, but the solutions are prosaic and dull.”<sup>9</sup>

Similarly, the epic biblical film, *Noah*, was debated as a cli-fi film. The film’s director said that it did not shy away from an environmentalism theme and purposely aimed to connect with timely climate issues, describing Noah as the “first environmentalist”. The ability for films to cover the disaster aspect of climate change speaks to the opportunity for films to engage audiences in affective, emotional responses to the impacts of the problem, but emphasizes the challenge in addressing the (very complex) problem of motivating solutions.

Perhaps all films related to the macro impacts of climate change, such as sea level rising, drought, flooding, lack of water resources, increased storm severity, increased wildfires, changing agricultural productivity, the impact of storms on communities, and violent conflict over resources (IPCC, 2014), should all be considered as cli-fi.

But, does it really matter how these films are labeled? Perhaps more important, is that the film’s climate messages are presented accurately, and in a way that respects the reason people watch fiction films: for entertainment value. For example, the huge popularity of dystopian films and novels such as the *Hunger Games* and *Divergent*, that show a future Earth ravaged by climate change, can perhaps encourage younger generations to think about climate change. However, in a 2012 article in *Grist*, the author asked young adult theatergoers for their opinion on the connection between *the Hunger Games* and climate change. After speaking to several viewers, he concluded that, with limited obvious references to climate change in the film, whether the film did, in fact, influence youth is difficult to tell and more research is needed.<sup>10</sup>

Indeed, a crucial point on climate change communications in film, and other dramatic media, however, is that communicating the issue may be more effective when placed more broadly into media *not* specifically identified as climate-related. Embedding information and behavioral role models in an Entertainment Education format may, therefore, reach a wider audience and reduce problems of avoidance and reactance (Bandura, 2004; Howell, 2014a). As a result, it seems films do not need to explicitly state they are about climate change, but they should be clear on the climate message they are telling, and weave this effectively into the story.

### *Making credible science into a great story*

Whether cli-fi can make a difference in how people react to global warming was debated in a *New York Times* column in 2014.<sup>11</sup> They note that a challenge with cli-fi is that the solutions presented to deal with catastrophic scenarios are “seldom workable, immediately possible, or even logical in real-world application”. Instead, enabling positive feedback on individual actions, focusing on solutions rather than on

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<sup>8</sup> *The Guardian*, 2014, <http://www.theguardian.com/film/2014/oct/29/interstellar-michael-caine-christopher-nolan-climate-change>

<sup>9</sup> *The Atlantic*, 2014 <http://www.theatlantic.com/entertainment/archive/2014/11/why-interstellar-ignores-climate-change/382788/>

<sup>10</sup> *Grist*, 2012. <http://grist.org/climate-change/katniss-evergreen-do-hunger-games-fans-care-about-climate/>

<sup>11</sup> *New York Times*, 2014. <http://www.nytimes.com/roomfordebate/2014/07/29/will-fiction-influence-how-we-react-to-climate-change>

catastrophic consequences of climate change, and making complex science-based messages tangible and more concrete by using images, metaphors and visualizations may be more important (Wibeck, 2014).

Another view in the article was that films like *The Day After Tomorrow*, which depict a sudden and calamitous climate shift, are in reality, highly unlikely to occur. “Films like this risk providing ammunition to climate change deniers when reality doesn’t follow the fast-moving template of Hollywood fictions.” The same denier vein may be activated when the film’s antagonist is the climate change activist, as in 2014’s *Kingsmen: The Secret Service*, and to a less direct degree, the 2008 Bond movie *Quantum of Solace*, where the villain buys up land in South America in order to control water supplies.

In *Kingsmen*, the megalomaniac villain is social engineering the planet because of his belief in population growth driving climate change. This is actually a complex issue of consumption vs. population growth as drivers of climate change and, although the film highlights climate as a problem, it advocates an inaccurate solution (Trewavas, 2002) from a “world-threatening villain of *Kingsmen* [as] a climate change activist.”<sup>12</sup>

One thing that is agreed in the popular and academic literature, however, is that emotion counts. A climate scientist who wrote for the climate-documentary series *Years of Living Dangerously* said that despite her goal to make sure the science was accurate, it was the personal, compelling stories of people that captured viewers. As another contributor in the *New York Times* article put it: “the best stories take us inside of storytelling so seamlessly, that when we emerge, the impossible is easier to imagine. This fiction creates a space in our minds to consider other perspectives and adopt new solutions.”

Weaving climate change messages into movies, therefore, is about telling a story that people can connect with, and creating an imaginable future that includes real-world climate change solutions. Not solutions that avoid an unrealistically cataclysmic event or, on the other end of the scale, are purely scientific, but the solutions that allow us to better understand the problem itself, the people who are affected by it, and how this connects all of us, as human beings, to the Earth’s limited precious resources that enable our survival. Filmmakers, therefore, have the task to create a compelling story, but base it on the reality of science, and include feasible solutions.

## 5. RECOMMENDATIONS AND KEY QUESTIONS FOR FILMMAKERS:

For the most part, existing studies on behavior change related to climate films fall short of carefully examining what worked, and did not work, in the film. Communication maxims such as the importance of engaging people emotionally, carefully defining communication goals, fostering meaningful dialog or a two way communication model, and knowing one’s audiences, are all important components of an effective strategy (Nerlich et al., 2010).

Filmmakers can be important players in helping solve this problem. As Moser (Moser, 2010) notes, on the whole, there is no direct correlation between communication and behavior change. Instead, filmmakers need to understand the way that climate science blends with culture and social norms as audiences receive information (Sakellari, 2014). What is needed is a mix of measures, of which communication is only one, that are embedded in other approaches, and are directly linked to practical behavior in social life.

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<sup>12</sup> *The Guardian*, 2015, <http://www.theguardian.com/film/filmblog/2015/jan/27/is-kingsman-the-most-conservative-comedy-this-century>



### *Putting the climate into mainstream movies*

A key recommendation is to help create a broader understanding of climate change issues in the film industry. This should be combined with education on the positive effectiveness that film can have in changing early-stage attitudes; an important component in addressing action on climate change. A major challenge for climate change filmmakers is, of course, to attract audiences. As a result, embedding climate change themes in more popular or mainstream movies has great potential. Rather than overt messages, these films “should contain realistic depictions of the issue to provide accurate information, and show how ‘people like me’ can tackle the problem, to promote engagement and self-efficacy” (Howell, 2014a).

In other words, the climate message has to be entertaining. Already, there is considerable media attention on ‘green fatigue,’ and ‘climate fatigue’, especially for a problem which is hard to grasp, has many drivers and solutions, and is seen as something way off in the future. To bring the message home, there are lessons to be learned from locally organized initiatives. Using language that everyday people know and understand may be a useful route to bring people in on an emotional and practical level. In this way, films can, first, facilitate public acceptance of climate change rules and regulation; and, second, stimulate grassroots action through affective and rational engagement with climate change (Ockwell et al., 2009).

### *Using existing film industry processes to improve climate film-making*

A few studies have tested particular messages, framings, and audience responses, however these are not well publicized, and some are proprietary. Therefore, it would be helpful for filmmakers to use the data they have collected during pre-testing frames, narratives, imagery and messages, and screen tests, to enable partner organizations, or other communication channels in general, to improve their communication and engagement practices, and to document the impact of an individual film. This could offer both valuable practical and theoretical insights.

This is especially the case given that movies can influence people at early stages of change, improving people’s acceptance of the issue. Combining dramatic relief (engagement) with consciousness-raising (understanding) and self-liberation (enabling action) seems to be the winning combination to create and sustain motivation for behavior change in the audience.

### *Transmedia campaigns: combining film with other communication initiatives to enable action*

A film on its own is unlikely to achieve significant and widespread climate change mitigation action, given the number of factors that affect behavior, so it is advisable to consider how movies can be teamed with other interventions (Howell, 2014a).

According to the TTM, films with climate messages seem to nudge people from pre-contemplation to contemplation, or from contemplation to preparation, among an audience who were at early stages of change (Howell 2015). Films, therefore, need to be coupled with other interventions if they are to help people progress from contemplation to action.

Low barriers to easily identifiable action are, therefore, important for allowing people to take action quickly after the film, following, for example, public commitments and pledges. There is significant room to use *Transmedia Storytelling* (TS) campaigns, including the use of the internet, mobile applications, and even user-generated content (such as reactions to the film on YouTube), to foster engagement, community, and action.

The Blair Witch Project (1999) was the first large scale successful TS approach for film, using the Internet to create marketing buzz and generate interest on a low advertising budget. TS tells a single story through

multiple media channels including games, books, cinema, television, apps, and the Internet. The idea is to not only reach a wider audience, but to expand the narrative of the story through interaction and ‘bottom-up’ community conversation on the issues (Jenkins, 2006). For climate change films, TS may be especially important in focusing on enabling behavioral change and local grassroots action associated with film releases. This could involve, for example, combining the story and emotion of the film with links to more information, events, and internet-based interaction for audience members so they can ‘participate’ in the story and climate action.

The documentary *This Changes Everything* (2015), for example, includes a “Beautiful Solutions” section on the film’s website. The website pulls together “the most promising and contagious strategies for building a more just, democratic and resilient world”. Website visitors can explore stories, theories and values to find the topic they are most interested in, or add their own solution.

Filmmakers, who wish to encourage actual action, rather than just early-stage progression, should consider portraying behavioral processes of change. Consciousness-raising and dramatic relief may help to reinforce behavioral change among audiences who are already taking action (Howell, 2014a).

## 6. IN SUM: HOW FILMMAKERS CAN HELP MAKE CLIMATE-FICTION HIT THE MARK:

There are significant opportunities for film to mobilize people to take action on climate change. It is not a simple task, but both psychology theory and the mainstream media provide theories and practical examples that filmmakers can draw on:

- The climate message has to be entertaining: embed persuasive content and messages into enjoyable movies rather than making the message too overt. For example, films do not need to explicitly state they are about climate change, but they should be clear on the climate message they are telling and weave this into the story.
- Films should contain realistic depictions of the issue to provide accurate information, and show how ‘people like me’ can tackle the problem to promote engagement and action. Filmmakers keen to stimulate action through behavior change in the audience may need to give more attention to portraying the processes that help to support and maintain behavioral change (such as practical actions people can take), but within the context of drama and emotional engagement.
- Climate messages will be better absorbed if filmmakers understand their audiences, and their values, fears, and hopes. Test screening specifically for climate messages would be very useful to help better understand these audience perceptions.
- Climate films don’t (and shouldn’t) have to focus solely on the future. Current actions and behaviors to deal with climate impacts can be the seed for the human story to be told.
- Filmmakers could also share information collected during the test screening, pre-testing of frames, narratives, imagery and messages, to enable partner organizations, and other communication channels, to improve engagement practices, and to document the impact of individual films.
- Transmedia storytelling can provide people with an easy point of entry to take action on the issue, and support the marketing of the film itself. Linking the emotional/affective component of films, which invites people to think about the issue, to opportunities for practical action (for example, through transmedia campaigns), may be a way for filmmakers to create engaging and successful films whilst simultaneously enabling people to mobilize and take action on climate change.

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## 8. CLIMATE CHANGE DOCUMENTARIES AND CLI-FI MOVIES<sup>13</sup>

Title and Year	Synopsis	Box Office Gross <sup>14</sup>
<b>Cli-Fi</b>		
<b>The Age of Stupid (2009)</b>	A man living in the devastated future world of 2055 looks back at old footage from our time and asks: why didn't we stop climate change when we had the chance?	Not available
<b>Autómata (2014)</b>	Jacq Vaucan is an insurance agent of ROC robotics corporation who investigates cases of robots violating their primary protocols against altering themselves. What he discovers will have profound consequences for the future of humanity.	Not available
<b>Beasts of the Southern Wild (2012)</b>	Faced with both her hot-tempered father's fading health and melting ice-caps that flood her ramshackle bayou community and unleash ancient aurochs, six-year-old Hushpuppy must learn the ways of courage and love.	\$USD 21,107,746 (Worldwide)
<b>Chloe and Theo (2015)</b>	Theo, an Inuit from the Arctic, travels to New York City to warn world leaders about the catastrophic impact of global warming on the planet.	Not available
<b>The Day After Tomorrow (2004)</b>	Global warming unleashes global catastrophe in the form of tornadoes, hurricanes, floods and a tsunami — ushering in a new Ice Age in this blockbuster. The effects are powerful but the plot's predictable: a climatologist hero heads to devastated Manhattan to rescue his son.	\$USD 544,272,402 (Worldwide)
<b>Godzilla (2014)</b>	The world is beset by the appearance of monstrous creatures, but one of them may be the only one who can save humanity.	\$USD 529,076,069 (Worldwide)

<sup>13</sup> Note this is non-exhaustive and focuses on the films have climate change as a strong theme.

<sup>14</sup> Source: [www.boxofficemojo.com](http://www.boxofficemojo.com)

<b>The Hunger Games (2012)</b>	Katniss Everdeen voluntarily takes her younger sister's place in the Hunger Games, a televised competition in which two teenagers from each of the twelve Districts of Panem are chosen at random to fight to the death.	\$USD 694,394,724 (Worldwide)
<b>Interstellar (2014)</b>	A team of explorers travel through a wormhole in space in an attempt to ensure humanity's survival.	\$USD 675,020,017 (Worldwide)
<b>Into the Storm (2014)</b>	Storm trackers, thrill-seekers, and everyday townspeople document an unprecedented onslaught of tornadoes touching down in the town of Silverton.	\$USD 161,502,194 (Worldwide)
<b>Kingsmen: the Secret Service (2014)</b>	A spy organization recruits an unrefined, but promising street kid into the agency's ultra-competitive training program, just as a global threat emerges from a twisted tech genius/climate change activist.	\$USD 413,685,624 (Worldwide)
<b>Mad Max Fury Road (2015)</b>	A woman rebels against a tyrannical ruler in post apocalyptic Australia in search for her homeland with the help of a group of female prisoners, a psychotic worshiper, and a drifter named Max.	\$USD 374,736,354 (Worldwide)
<b>Noah (2014)</b>	A man is chosen by his world's creator to undertake a momentous mission before an apocalyptic flood cleanses the world.	\$USD 362,637,473 (Worldwide)
<b>Quantum of Solace (2008)</b>	James Bond descends into mystery as he tries to stop a mysterious organization from eliminating a country's most valuable resource. All the while, he still tries to seek revenge over the death of his love.	\$USD 586,090,727 (Worldwide)
<b>Snowpiercer (2013)</b>	Set in a future where a failed climate-change experiment kills all life on the planet except for a lucky few who boarded the Snowpiercer, a train that travels around the globe, where a class system emerges.	\$USD 86,758,912 (Worldwide)
<b>Take Shelter (2011)</b>	Plagued by a series of apocalyptic visions, a young husband and father questions whether to shelter his family from a coming storm, or from himself.	\$USD 3,099,314 (Worldwide)

<b>Tomorrowland (2015)</b>	Bound by a shared destiny, a teen bursting with scientific curiosity and a former boy-genius inventor embark on a mission to unearth the secrets of a place somewhere in time and space that exists in their collective memory.	\$USD 208,636,322  (Worldwide)
<b>Young Ones (2014)</b>	Set in the future when water is hard to find, a teenage boy sets out to protect his family and survive.	Not available
<b>Documentaries</b>		
<b>The 11th Hour (2007)</b>	A look at the state of the global environment including visionary and practical solutions for restoring the planet's ecosystems.	
<b>An Inconvenient Truth (2006)</b>	2006's Oscar-winning documentary brought former Vice President Al Gore's global warming crusade to the multiplex and into the mainstream. More than just a lecture and scarier than any horror flick, it illustrates in no uncertain terms what man has done to the planet and what will happen if we don't act now to reverse the damage.	\$24,146,161  (Worldwide)
<b>An Inconvenient Youth (2015)</b>	Documentary that gives a voice to kids on the front lines of climate change. Set against stunning visuals of a planet in crisis, we tell the untold stories of youth around the world standing up for a green, sustainable future they refuse to let slip away.	Not available
<b>Antarctic Edge: 70° South (2015)</b>	In 2014, scientists declared West Antarctic ice sheet melt unstoppable, threatening the future of our planet. A group of world-class researchers is in a race to understand climate change in the fastest winter-warming place on earth: the West Antarctic Peninsula. Trekking through dangerous and uncharted landscape, these scientists push the limits of their research and come to terms with the sacrifices necessary to understand this rapidly changing world.	Not available
<b>Carbon Nation (2010)</b>	An optimistic (and witty) discovery of what people are already doing, what we as a nation could be doing and what the world needs to do to prevent (or at least slow down) the impending climate crisis.	\$16,901



<b>Chasing Ice (2012)</b>	Follow National Geographic photographer James Balog across the Arctic as he deploys time-lapse cameras designed for one purpose: to capture a multi-year record of the world's changing glaciers.	\$1,328,467
<b>Climate Refugees (2010)</b>	Filmmaker Michael Nash investigates mass migration caused by our changing climate.	Not available
<b>The Crisis of Civilization (2011)</b>	The Crisis Civilization is a documentary feature film investigating how global crises like ecological disaster, financial meltdown, dwindling oil reserves, terrorism and food shortages are converging symptoms of a single, failed global system. Proving that 'another world' is not merely possible, but on its way.	Not available
<b>Disruption (2014)</b>	During around 52 minutes, "Disruption" gives us the key story behind the climate crisis, interviewing different specialists, authors and community organizers. The film questions whether money can really be more important than health or sustainability. The directors appear at the end of the movie appealing for a behavioural change and a larger awareness.	Not available
<b>Everything's Cool (2007)</b>	For the past two decades researchers, activists, scientists, and progressive politicians have struggled to rouse the public and the federal government to take action on global warming. Concurrently, naysayers, industry funded think-tanks and lobbyists have worked tirelessly to challenge, convolute and dismiss the issue as hysterical. Everything's Cool tells the harrowing story of what it takes to talk about global warming -- the art of duking it out with collective denial, the struggle to communicate the urgency of the crisis to an indifferent public and a laggard United States government. We follow a cadre of messengers who are passionate, exasperated, driven by fear, hope and a deep appreciation for the ever shrinking window of time we have to stop global warming.	Not available
<b>Global Warming - the Signs and the Science (2005)</b>	60 minute documentary about people across America living with the grave consequences of a changing climate and the individuals, communities and scientists inventing new	Not available

	approaches to safeguard our children's future.	
<b>The Great Global Warming Swindle (2007)</b> (Climate sceptic documentary)	A polemical documentary film that suggests that the scientific opinion on climate change is influenced by funding and political factors, and questions whether scientific consensus on anthropogenic global warming exists. The program was formally criticised by Ofcom, the UK broadcasting regulatory agency, which upheld complaints of misrepresentation made by David King. The film, made by British television producer Martin Durkin, presents scientists, economists, politicians, writers, and others who dispute the scientific consensus regarding anthropogenic global warming. The programme's publicity materials assert that man-made global warming is "a lie" and "the biggest scam of modern times."	Not available
<b>The Island President (2011)</b>	After bringing democracy to his country, President Mohamed Nasheed of the Maldives, the lowest-lying country in the world, takes up the fight to keep his homeland from disappearing under the sea.	\$76,398
<b>Merchants of Doubt (2014)</b>	A documentary that looks at pundits-for-hire who present themselves as scientific authorities as they speak about topics like toxic chemicals, pharmaceuticals and climate change.	\$192,400
<b>Meat the Truth (2008)</b>	Meat the Truth is a high-profile documentary which forms an addendum to earlier films on climate change. Although such films have succeeded in drawing public attention to the issue of global warming, they have repeatedly ignored one of the most important causes of climate change: the intensive livestock production. Meat the Truth draws attention to this by demonstrating that livestock farming generates more greenhouse gas emissions worldwide than all cars, lorries, trains, boats and planes added together.	Not available
<b>Switch (2012)</b>	"Switch," a thorough and sober-minded documentary about the past, present and future of energy, is refreshingly free of hot air. What will it really take, to transition from oil and coal, to the energies of tomorrow? SWITCH goes where no film has gone before, deep into	Not available

	the world's most restricted energy sites, to depoliticize competing power sources, make the technical accessible, and discover the truth of our energy future. Test audiences have raved, calling it, 'The most important energy film since An Inconvenient Truth.'	
<b>This Changes Everything (2015)</b>	A look at seven communities around the world with the proposition that we can seize the crisis of climate change to transform our failed economic system into something radically better. Narrated by Naomi Klein.	\$16,692

### Other Cli-Fi movies not mentioned in the article

<b>Title and Year</b>	<b>Synopsis</b>	<b>Box Office Gross<sup>15</sup></b>
<b>A.I. Artificial Intelligence (2001)</b>	Set in climate changed world near flooded ruins of New York City, where global warming has led to ecological disasters all over the world in the mid-22nd century, a highly advanced robotic boy longs to become "real" so that he can regain the love of his human mother.	\$USD 235,926,552 (Worldwide)
<b>The Arrival (1996)</b>	Extraterrestrial aliens attempt to secretly cause global warming and thereby terraform Earth into an environment more suited to their needs.	\$USD 14,063,331 (Domestic, USA)
<b>Beyond the Pole (2009)</b>	A quirky, moving and very funny tale of two friends that set out on a heroic trip to the North Pole only to discover that before they can become heroes, they must first become men.	Not available
<b>The Colony (2013)</b>	Forced underground by the next ice age, a struggling outpost of survivors must fight to preserve humanity against a threat even more savage than nature.	Not available
<b>The Day the Earth Stood</b>	Klaatu, an alien, is prepared to have his robot enforcer, Gort, destroy the earth in order to	\$USD 233,093,859

<sup>15</sup> [www.boxofficemojo.com](http://www.boxofficemojo.com)

<b>Still (2008)</b>	prevent a global crisis caused by humans not changing their wasteful, violent ways. Also, Fox's first green production.	(Worldwide)
<b>Happy Feet (2006)</b>	The Best Animated Film Oscar of 2006 went to this cartoon about a penguin whose inability to sing sets him apart. Amid musical numbers there are messages about prejudice, individuality, tolerance and being environmentally conscious. A pivotal plot point involves the over-fishing of the penguins' feeding grounds, endangering the habitat and the species	\$USD 384,355,608 (Worldwide)
<b>Ice Age: The Meltdown (2006)</b>	This 2006 animated sequel has its prehistoric protagonists fleeing the melting ice that will flood their valley and bring premature (though inevitable) extinction.	\$USD 660,940,780 (Worldwide)
<b>The Last Survivors (2014)</b>	A teenage girl fights to protect the last working well in a drought-stricken valley from a greedy water baron.	Not available
<b>Madagascar: Escape to Africa (2008)</b>	While the hit sequel about wayward zoo animals is played for laughs by its cast of comedians, there's a minor environmental plot thread with a potentially serious outcome: stranded tourists selfishly dam a river, diverting the water supply and threatening the idyllic ancestral watering hole.	\$USD 603,900,354 (Worldwide)
<b>Night Moves (2013)</b>	Three radical environmentalists look to execute the protest of their lives: the explosion of a hydroelectric dam.	\$USD 271,755 (Domestic, USA)
<b>Soylent Green (1973)</b>	With the world ravaged by the greenhouse effect and overpopulation, an NYPD detective investigates the murder of a CEO with ties to the world's main food supply.	Not available
<b>Split Second (1992)</b>	In a futuristic London, the rising sea levels mean that large areas are under feet of water. Hauer plays a cop who previously lost his partner to some strange creature. Now the creature is back and its after him.	\$USD 5,430,822 (Domestic, USA)
<b>Wall-E (2008)</b>	The sweet, romantic, Oscar shoo-in cartoon about a lonely trash-compacting robot makes its eco-point subtly and succinctly — it's set in a future Earth that has become a garbage-covered wasteland, left to rot because fat, lazy humans ruined it. The hopeful ending reminds us it's not	\$USD 521,311,860 (Worldwide)

	too late to change.	
<b>Waterworld (1995)</b>	In a future where the polar ice caps have melted and Earth is almost entirely submerged, a mutated mariner fights starvation and outlaw "smokers," and reluctantly helps a woman and a young girl try to find dry land.	\$USD 264,218,220 (Worldwide)