
Research article

Notes from the field – shooting green: the role of cinematography in eco-pedagogy

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Abstract

Film production has a significant environmental impact, with an average tentpole film producing 2,840 tonnes of CO₂ equivalent. At the University of Lincoln, UK, we address this through our BA Film Production curriculum, which integrates sustainable cinematography practices, particularly natural lighting techniques taught in our Level 5 module. This not only educates students about environmental benefits; it also demonstrates the aesthetic merits of these methods. Our BAFTA albert certified training, starting from Level 4, instils sustainability at the core of student projects. By 2025/6, we aim for all graduation projects to achieve albert classification, a goal initiated by our 2023/4 cohort's success in producing a classified film through sustainable practices such as repurposing resources. The effectiveness of our training is gauged by the growing number of graduation projects attaining albert carbon-neutral classification. This article provides insights into embedding sustainable practices within our curriculum, and how our academic research informs undergraduate and postgraduate modules. It will also reference *Mind-Set*, directed by Mikey Murray and released in 2022, a University of Lincoln project exemplifying sustainable themes and practices. In conclusion, our graduates are becoming sustainability leaders in the film industry. By exposing them to climate change challenges and the creative possibilities of natural light cinematography, as seen in *Nomadland* (directed by Chloé Zhao, and released in 2020) and *Mind-Set*, we are nurturing the next generation of innovators.

Keywords sustainable film production; eco-pedagogy; cinematography; BAFTA albert; student engagement; natural light; new naturalism; carbon neutral; net zero

Introduction

Film production has a significant environmental impact, with an average tentpole film producing 2,840 tons of CO₂ equivalent (BFI, 2020). Cinematography is one of the key contributing factors to the global film industry's carbon emissions. The British Film Institute's (BFI) Screen New Deal (2020) identified five 'key areas of opportunity for transformation', all of which in some respects relate to the cinematography department's current working practices. Cinematography is a significant contributor in this regard, as it often requires large equipment, personnel and transport, while mains electricity is commonly used for lighting, and sometimes diesel generators when mains is not an option.

This article assesses my current approaches to working as a practising cinematographer, in my role as a Senior Lecturer at the University of Lincoln, UK, where I teach core production skills on the BA Film Production, BA Media Production and BA Film and Television Studies degrees, alongside an elective module titled Advanced Craft Skills Cinematography. In this article, I reflect on how my pedagogical approaches are underpinned by a drive towards reducing the carbon footprint of cinematography practices, not only for sustainability reasons, but also because the limitations presented by utilising fewer resources encourage creative innovation and 'possibility thinking' for students. In doing so, I relate to the 'New Naturalism' identified by B (2021a), and seen in the work of cinematographers such as Emmanuel Lubezki and Joshua James Richards, which also relates to the aesthetic qualities of the images produced with less reliance on artificial lighting set-ups. Subsequently, I discuss the implementation of the albert training and certification programmes of the British Academy of Film and Television Arts (BAFTA) at the University of Lincoln. I then consider the relationship between practice, research and teaching through a discussion of a feature film that was made over the course of 11 days by University of Lincoln staff and students in 2019, on which I was the cinematographer. Finally, I explain an experimental approach to teaching sustainability practices in cinematography at the University of Lincoln, based on what I have learned from these experiences.

Adapting lighting practices, the New Naturalism and doing more with less

Vaughan and Kääpä's (2023) report *Sustainable Digitalisation: Ensuring a sustainable digital future for UK film and television* offers policy recommendations and alterations to practices within film production to aid the reduction of carbon emissions. However, the report does not directly specify the contribution of cinematography, although it focuses on the life cycles of equipment, production cultures and energy futures, all of which are intertwined with the cinematography department.

A form of sustainable cinematography, which I am calling 'New Naturalism' (borrowed from Emmanuel Lubezki), has many positives in addition to embedding more environmentally sustainable practices. Based on the concept developed by the director and cinematographer duo Terence Malick and Emanuel Lubezki, who first coined the phrase when they were shooting *The New World* (Malick, 2005) and *The Tree of Life* (Malick, 2011), it proposes privileging shooting with natural light amid other factors to achieve greater authenticity. As explored by B (2021a, 2021b), this 'New Naturalism' has been further enhanced by director Chloé Zhao and her cinematographer Joshua James Richards, as seen in *Songs My Brothers Taught Me* (2015), *The Rider* (2017) and *Nomadland* (2020).

A positive by-product of practising this form of New Naturalism is allowing actors and crew space and time, given the need for fewer cumbersome and large lighting set-ups. Reflectors do not need cables, and they can be far more easily rigged to ceilings or walls, which means fewer health and safety considerations, and which allows for a quicker set up. Clare and Smith (2020: 65) discuss the efficiency of

using a single light source, natural and available light, and reflectors, emphasising that these methods are less time-consuming to set up and work primarily with reflective light, which can 'reproduce convincing "sunlight" through the first floor window of a house without the need for a cherry-picker or generator'.

In teaching cinematography at the University of Lincoln, there is often a tension between students wanting to get experience using industry-standard lighting rigs for their professional development, and my approach to designing the curriculum in a way that embeds sustainable approaches to practice early in their career. One of the ways I frame this is through the idea of 'creative constraints'; that is, if they learn to do more with less, they will ultimately be improving their employability prospects as well as improving their problem-solving skills. Given that they are likely to initially find work in the no- or low-budget realms of film-making, and the increasing emphasis on sustainable measures in the industry itself, their prospects are further enhanced through this approach.

[Pace and Strobbe \(2023\)](#) also examine this issue within the framework of choice as a challenge. Similar to film-makers, students can benefit from having certain choices predetermined, allowing them to focus on their learning without feeling overwhelmed. The authors discuss how film-makers often need to balance the creative demands of storytelling with the practical constraints of budgeting and scheduling a shoot. Negotiating this divide can contribute to feelings of overwhelm when faced with the multitude of decisions that need to be made, whereas with fewer choices due to imposed limitations, students can focus on the things that really matter. This also has a wider philosophical underpinning which goes beyond ideas about creative film practice. As [Pace and Strobbe \(2023: 9\)](#) write: 'Until you learn what you can really do with what you already have, you won't realize all you truly have.' Given the knowledge that we all have to adapt our behaviours and patterns of consumption in order to do more with what we already have, rather than continuing to pursue growth to its logical conclusion of environmental collapse, the approach to something relatively niche such as cinematography becomes analogical to other ways of living. As [Hjort \(2022\)](#) writes: 'The twin factors of limited resources and a consistent emphasis on the cultural, social and political contributions of film making create a fertile environment, I contend, for the emergence of sustainable filmmaking practices.'

BAFTA albert

In addition to teaching cinematography, I also provide BAFTA albert certification training for the school. This training is conducted twice a year: first, it is included in a core production skills module for first-year undergraduates, and is attended by over 90 students; later in the year, it is offered to the broader student body through sign-ups, including master's students, allowing students plenty of opportunities throughout their three years of study to undergo the training and gain an industry-recognised certificate that combines both environmental sustainability and employability.

The BAFTA albert certification content and delivery are carefully planned and carried out by albert and supported by the trainers. The training takes around eight hours, split into two four-hour sessions over two days, and it includes a slide deck, created by albert, which maintains consistency of training across all institutions. There are four assignments for the students to complete; I prefer them to do these during class to ensure higher completion rates. When the training was delivered as part of a core module for the first time, only 18 out of 60 students passed and graduated with the certificate. This was mainly due to students needing to complete the assignments after the training and their focus shifting to their module assessments and group projects. However, conducting the sessions as a core part of Level 4 is crucial, as it helps instil sustainable practices into the students' work from an early stage.

In 2024, we celebrated our first Graduation Project film, which obtained the albert logo at the end of the film due to the sustainable practices used by the production team. The entire set, including props, was generously donated to the university for future projects. It now resides in a dedicated room for teaching and project development, where sustainable cinematography practices are embraced, giving the set a dual legacy in sustainability. The students made use of online planning and meeting tools for

pre-production with the cast and crew, and they carefully chose locations that could be walked to or were accessible by public transport, adding to the sustainable practices employed during production.

For the 2024/5 academic year, we have set a goal for 50 per cent of the BAFTA albert certification students to pass the training and gain the award, which, at the time of writing, we have achieved, with 59 students out of 81 becoming certified. We aim to increase this until we sit around the 90 per cent mark, which is ambitious for something that is core but not assessed as part of the degree. There are discussions about making passing it have a similar weight to work experience requirements or credit-bearing additional activities that other institutions require to be completed before a student can graduate. Currently, 100 per cent of the students who sign up to undertake the training when we run the voluntary sessions pass and graduate with the certificate. This shows that when the desire to learn about sustainability is there, the students engage and pass. However, it seems that not all students want this, and the reasons are not entirely clear. However, I feel that it is of vital importance, and the knowledge gained is such a key employability skill, that it is as vital for students to understand this as it is for them to understand practical film-making. I am treating understanding the environmental and social impacts of film production as a key craft role.

Clare and Smith (2020: 67), when discussing their production techniques of only shooting with reflected and bounced light within the context of the BAFTA albert certification, have found that:

The requirement to provide productions with a BAFTA albert certificate is becoming the norm, and groups such as AdGreen and CUT IT are actively striving to be energy-efficient and reduce waste on shoots. We are finding that, on average, we have reduced the number of lighting fixtures we need by 60%.

Practising what we preach

In 2019, we made *Mind-Set* (Murray, 2022), filmed entirely in Lincoln, and supported by a local crew of graduates, staff and students, with equipment provided by the University of Lincoln, resulting in a major student engagement project to provide an opportunity to prove what we can achieve with the skills, talent and production facilities we have at the university. We decided at the outset to shoot using only natural light and available light as best we could, especially as the film had a sustainability message embedded within the screenplay and featured many aspects impacting the environment, not just pollution, but also our eating habits, the use of public and private transport, and the overall impact of living in and out of a major city. We knew we needed as much light as possible to succeed, so we shot during the summer solstice to give us the best opportunity to produce the look we wanted. In this section, I discuss how we worked within these creative constraints to achieve a film which had our desired aesthetic look, but which also had sustainability at the forefront.

The still in Figure 1 features an all-natural-light shot, achieved by working out the exact time when the light would shine through the window to give us the perfect opportunity to film the scene. We estimated that we would have the ideal opportunity at approximately five o'clock in the morning, so we had everyone arrive on set at 3.30 a.m. to prepare for the scene. We ensured that we finished early the day before, and we had a long break before doing anything else on the day we shot. That is the practice we developed to shoot in our preferred style. We were there for an hour before the light came through to get this shot, which is a key shot at the climax of the film.

Some LED lighting was used in the film. For example, Figure 2 shows a still from a scene set at night, which was shot during the day using blackout material behind the camera to achieve the look I was after. We were unable to shoot exclusively using natural and available light, mainly due to the demanding schedule of shooting a feature film in just 11 days. This highlights previously discussed concerns about how production schedules often take precedence over sustainability considerations. My first-hand experience on *Mind-Set* confirms that there is still a long way to go in achieving my goal of embracing New Naturalism in the world of film-making.

However, during filming, I developed some core principles for how I should work, and teach, in order to create the visual style I wanted to see in these films by incorporating as much natural light and available light as possible to shape the image. Moreover, these core principles, and my engagement with New Naturalism since I began teaching in 2015, became more vital as my practice and research progressed. This style of shooting, its challenges, and how best to work with people and places to overcome any technical restraints or artistic limitations have become my obsession, especially on low-budget productions.

There were constraints that, on paper, looked to restrain me, but, in reality, they fuelled my vision and creativity, and that has formed a big part of what I am as a cinematographer and educator, and what, I hope, my graduates become. In their new book, *The Filmmaker's Guide to Creatively Embracing Limitations*, Pace and Strobbe (2023: 61) outline that 'sometimes a limitation doesn't just create a new technology or advancement – sometimes what it does is help a filmmaker create a style that becomes their signature, an aesthetic that helps define who they are artistically'. To simplify, I created a style based on necessity rather than by design, and the process is a result of the circumstances in which I found myself, and it has been developed entirely through my experience of working on these low-budget and micro-budget films.

As I near the end of my second year of research for my part-time PhD, I am beginning practice-based experiments, which have become integral to my work as an educator. I am implementing many of the teaching strategies I use in the classroom into my own research, providing students with real-world examples of my curriculum beyond film production. This approach also offers them an opportunity to delve deeper into their studies through practical application. The working title of my PhD is 'Sustainable Practices in the Art and Craft of Cinematography'. I aim to investigate whether 'New Naturalism', with

Figure 1. A still from *Mind-Set* (Murray, 2022)

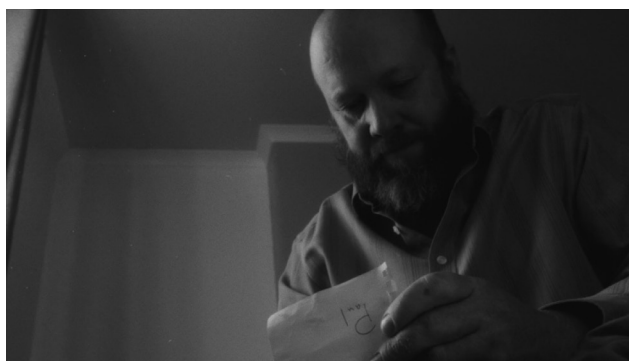


Figure 2. A still from *Mind-Set* (Murray, 2022)



its focus on natural light, can lead to more sustainable and environmentally friendly cinematography practices.

As part of my research, I am exploring the available technologies that can assist cinematographers in utilising natural or available light, while still being able to shape light and convey a narrative through the lens. I am embracing creative constraints to catalyse innovation, rather than viewing the requirements for environmental sustainability on a film set as an impediment.

Experimenting with sustainable lighting

To conclude this article, I present a proof of concept for a larger experiment, which will be carried out over the 2024/5 academic year. This aims to illustrate the emergence of sustainable cinematography in education being put into practice, and to showcase some of the expectations I have for my students' work, as well as my ability to demonstrate the concept to them and to other researchers. My hypothesis is centred on whether I can reproduce the same three-point lighting set-up to illuminate a 10-second portrait, once with a traditional three-point lighting arrangement, and once using the Light Bridge Cine Reflectors with a single light source. While these techniques are employed on film sets worldwide, there has been limited comprehensive assessment of their carbon footprint.

Figures 3 and 4 show the plans for my experiment in a simplified form as an overhead lighting plan. Figure 3 is a standard three-point lighting set-up to achieve an image with the subject looking directly at the camera. The constraints will be the camera, the focal length and lens, subject and camera settings: ISO, aperture, shutter speed and codec. Figure 4 shows the change to using reflectors instead of three lights. In Figure 5, the proof of concept demonstrates my ability to replicate the set-up using reflected light as intended. It also prompts considerations regarding aesthetics, as the reflected set-up is more visually appealing and results in fewer instances of light spill in the shot. To recreate the background exposure in the three-point set-up, flags to control light spills are necessary. Additionally, achieving the desired background exposure to fully replicate the original would require the use of more reflectors.

Figure 3. Set-up plan for standard three-point lighting

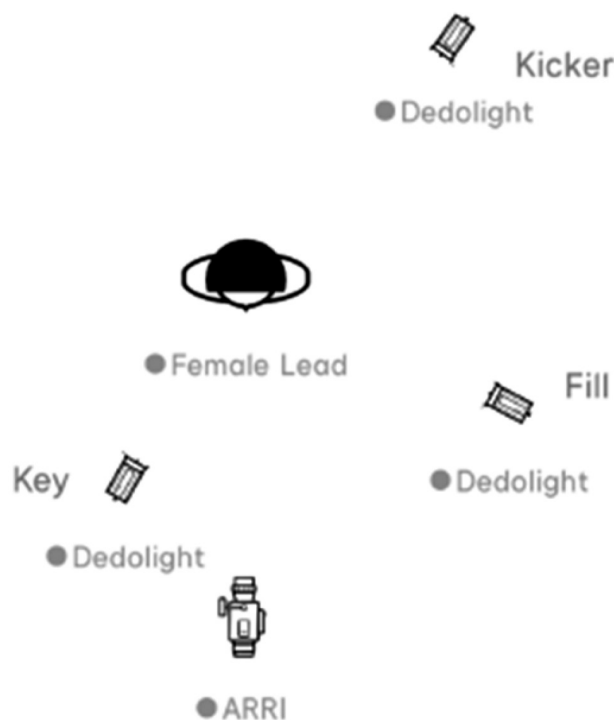


Figure 4. Set-up plan for reflected light

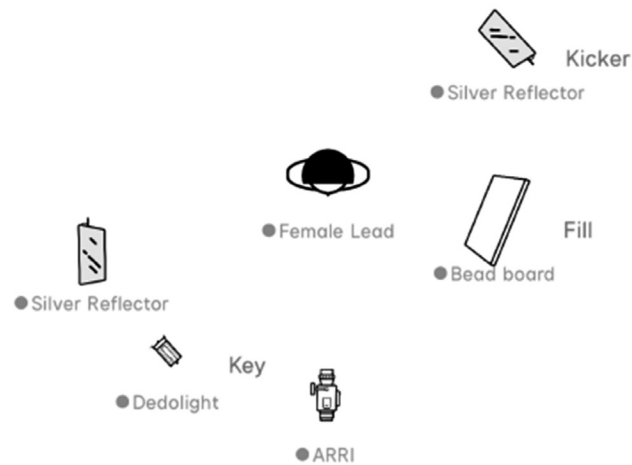


Figure 5. Screen grabs comparing the two different techniques used for aesthetic purposes

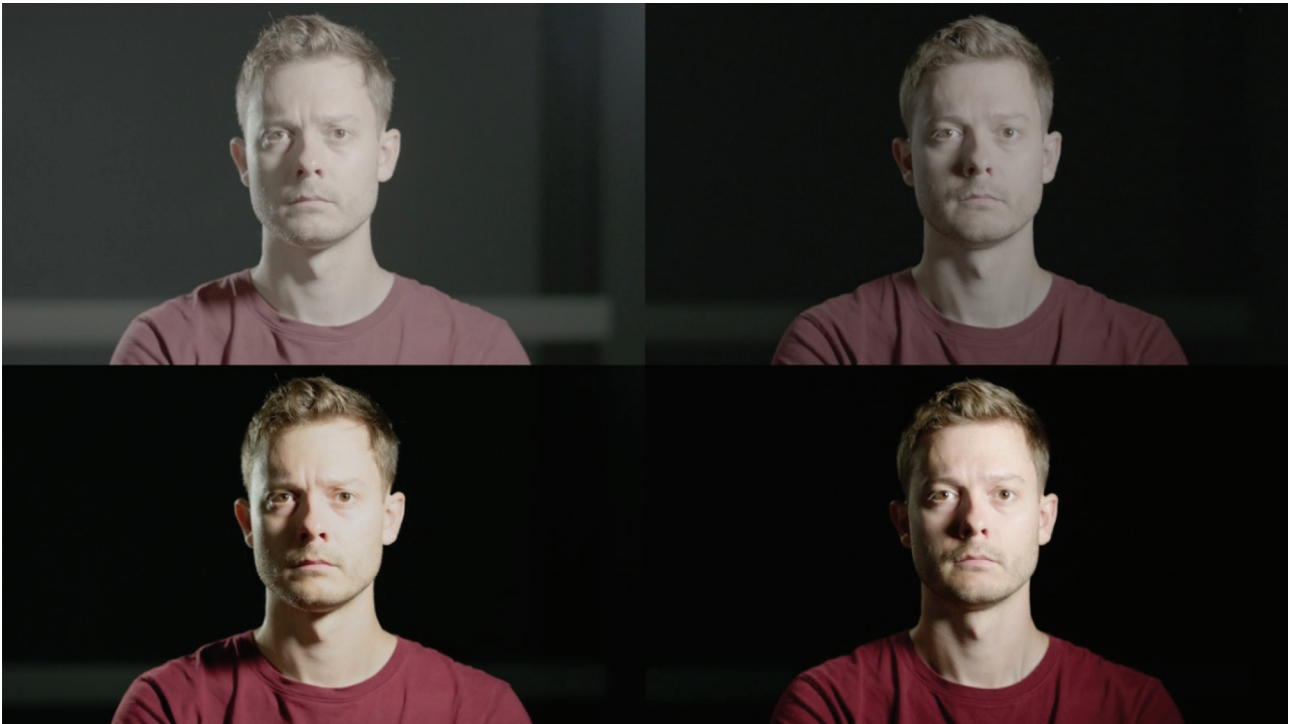


Figure 5 depicts the images at the top of the screen in Arri Log-C format and, at the bottom, colour-corrected using a standard Arri REC709 LUT. The left image is illuminated using three LED lights, while the right image is lit solely with reflected light.

The next phase of the experiment is to produce this same set-up but in the following ways:

- Set-up 1: three-point lighting 3 × 150w Dedo Lights
- Set-up 2: three-point lighting 1 × 150w Dedo Lights and reflectors
- Set-up 3: three-point lighting 3 × 40w LED Dedo Lights
- Set-up 4: three-point lighting 1 × 40w Dedo Light and reflectors
- Set-up 5: three-point lighting, sunlight and reflectors only.

Figure 6. Screen grabs comparing the two different techniques used for exposure purposes using a false colour reading



The goal is to utilise the BAFTA albert carbon calculator, which I require my students to use, and to present all five set-ups with the most similar false colour reading possible. To date, no one has replicated this and quantified the carbon savings achievable when producing the same image with reduced or zero artificial lighting. This will enable me to calculate both Scope 1 and Scope 2 emissions for the experiment, and to demonstrate the variance that each technique causes while maintaining consistent image exposure.

Figure 6 displays the experiment using the false colour exposure tool, illustrating that a comparable level of exposure can be achieved using both techniques. The pink colour represents 70 per cent IRE, which is the traditionally preferred exposure for Caucasian skin. The yellow colour indicates an increased exposure, as anticipated for an image converted to REC709. The purple on the back of the bottom right, representing the REC709 corrected bounce-only image, displays a well-exposed image with a uniform background, resulting in a more aesthetically pleasing image, as previously discussed. Enhancing exposure consistency is essential for the complete experiment.

In summary, the findings from my proof of concept are threefold. First, it demonstrates that it is possible to recreate traditional three-point lighting using a single light source that is reflected to produce three points of light illuminating the subject. Second, I have shown that I can achieve similar exposure ratings, meaning that no additional power is required to match the traditionally lit image created with three light sources. This indicates that it is not a false economy, where equal or more light would be necessary to achieve the desired look when using the reflected light technique.

Last, this study raises an unexpected question regarding aesthetics: does the reflected light image appear more visually appealing? If so, can we draw conclusions about how we have evolved to perceive light, which predominantly comes from a single source (the sun) and is then reflected around us to illuminate objects? This is perhaps a topic for another study, but it highlights that this technique offers benefits beyond environmental sustainability, including the potential to create more aesthetically pleasing images.

When exploring the impacts of sustainable cinematography practices, it is essential for us as educators not only to teach students how to achieve sustainable lighting, such as through the selection

of LED fixtures or the utilisation of natural light in New Naturalism, but also to instruct them on when and why to do so. As emphasised by Pace and Strobbe (2023: 7), in every aspect of film production, we must consistently ask ourselves, 'does this serve the purpose of what I want to achieve with this film?', whether it pertains to equipment, genre or cast. Even when practising sustainability, it is crucial to be mindful of the potential unintended consequences, such as the environmental impact of transporting too many stands or reflectors, and the importance of thorough planning, especially when shooting with natural light. Ensuring avoiding situations such as cast and crew arriving at a location only to be met with earlier-than-anticipated sunsets or overcast conditions demonstrates the necessity of clear and in-depth planning to allow for rescheduling or using specific fixtures to mimic natural lighting when it is the only option. Teaching students about this delicate balance is paramount in all our sustainability efforts.

To end, I want to briefly mention how we can trace the earliest use of the term 'sustainability' to the book *Sylvicultura oeconomica, oder haußwirthliche Nachricht und Naturmäßige Anweisung zur wilden Baum-Zucht* by Hans Carl von Carlowitz (1713), where it was associated with forest management – the practice of taking no more from the forest than can be replenished. This concept of balance is crucial for sustainable cinematography and film production, both in the industry and in education. It must be the cornerstone of all our efforts to integrate sustainability into our curricula. Resist the urge to go to extremes. Balance is essential, and it is where the most creative possibilities exist.

Declarations and conflicts of interest

Research ethics statement

Not applicable to this article.

Consent for publication statement

For the purposes of this article, consent was gained from the person identifiable within the proof of concept for this image to be used as part of the experiment. The release form can be requested from jshelbourn@lincoln.ac.uk.

Conflicts of interest statement

The author declares no conflicts of interest with this work. All efforts to sufficiently anonymise the author during peer review of this article have been made. The author declares no further conflicts with this article.

Filmography

Mind-Set (GB 2022, Mikey Murray)
The New World (GB/US 2005, Terrence Malick)
Nomadland (US 2020, Chloé Zhao)
The Rider (US 2017, Chloé Zhao)
Songs My Brothers Taught Me (US 2015, Chloé Zhao)
The Tree of Life (US 2011, Terrence Malick)

References

- B, B. (2021a) 'Nomadland: New Naturalism'. *American Cinematographer*, 25 January. Accessed 4 November 2022. <https://ascmag.com/articles/nomadland-new-naturalism>.
 B, B. (2021b) 'Nomadland – New Naturalism – Light as nature'. *The American Society of Cinematographers*, 22 January. Accessed 4 November 2022. <https://ascmag.com/blog/the-film-book/nomadland-1-new-naturalism>.
 BFI (British Film Institute) (2020) *A Screen New Deal: A route map to sustainable film production*. London: BFI.

- Clare, J. and Smith, J. (2020) 'Reflecting on Reflectric'. *Zerb*, 92, 65.
- Hjort, M. (2022) 'The Necessity of Sustainable Filmmaking: Production notes from Palestine, Burkina Faso, and Zanzibar'. In P. Kääpä and H. Vaughan (eds), *Film and Television Production in the Age of Climate Crisis*. Palgrave Studies in Media and Environmental Communication. London: Palgrave Macmillan, 97–120.
- Pace, W. and Stobbe, I. (2023) *The Filmmakers Guide to Creatively Embracing Limitations*. New York: Routledge.
- Vaughan, H. and Kääpä, P. (2023) *Sustainable Digitalisation: Ensuring a sustainable digital future for UK film and television*. Minderoo Centre for Technology and Democracy. <https://doi.org/10.17863/CAM.101504>.
- Von Carlowitz, H.C. (1713) *Sylvicultura oeconomica, oder haußwirthliche Nachricht und Naturmäßige Anweisung zur wilden Baum-Zucht*. Leipzig: Braun.