



# THE LIVES AND AFTERLIVES OF PLASTIC



**MASSEY  
UNIVERSITY**  
TE KUNENGA KI PŪREHUORA

UNIVERSITY OF NEW ZEALAND

POLITICAL  
ECOLOGY  
RESEARCH  
CENTRE

# CONTENTS

Timetable.....	1
Welcome.....	7
Keynote: Professor Richard C. Thompson.....	8
Keynote: Professor Gay Hawkins.....	10
Keynote: Professor Ian Shaw.....	12
Abstracts: Civic Laboratory of Environmental Action Research Panel.....	14
Abstracts: Marine Microplastics.....	17
Abstracts: Representations/Aesthetics.....	21
Abstracts: Packaging, LCA, and Design.....	24
Abstracts: Materiality One.....	27
Abstracts: Marine Plastics.....	33
Abstracts: Fabrics.....	36
Abstracts: Waste Management.....	39
Abstracts: Public Awareness of Marine Plastics.....	44
Abstracts: Materiality Two.....	48
Acknowledgments.....	52
Presenter Contacts.....	53

## **Week 1: June 26-June 30**

**Keynote:** *Marine Debris: Are There Solutions to this Growing Problem?*

Professor Richard C. Thompson

### **Panel 1: Civic Laboratory of Environmental Action Research**

*A Review of Marine Plastic Pollution in the Environment of Newfoundland and Labrador, Canada*

Ammendolia, J., Liboiron, F., Bradshaw, H., Dawe, N., Melvin, J., Novacefski, M., Saturno, J., Wells, E., Mather, C., Liboiron, M.

*Plastic Ingestion in Atlantic Cod (Gadus Morhua): Results From A Citizen Science Monitoring Project on the Southeast Coast of Newfoundland, Canada*

Jessica Melvin

*Citizen Science Tools, Practices, and Ethics for Monitoring Marine Plastics Developed in a Feminist Laboratory*

Max Liboiron

### **Panel 2: Marine Microplastics**

*Agglomeration of Nano and Microplastic Debris in Seawater by Bacterial Exopolymers*

Stephen Summers, Theodore Henry, and Tony Gutierrez

*Impacts of Microplastics on Commercial Mussels in a Warmer, More Acidic World*

Nova Mieszkowska and Gianluca Sarà

*Microplastics Identified in Deep-Sea Water and Ingested by Benthic Invertebrates: A Quantification and Characterisation*  
Courtene-Jones, W., Quinn, B., Gary, S.F., Mogg, M., and Narayanaswamy, B.E.

*Can Citizen Scientists Identify Microplastics Ingested by Atlantic Cod? A Single Blind Comparison Across Four Methods*  
Natalie Richárd

### **Panel 3: Representations/Aesthetics**

*Witnessing the Afterlives of Plastic: The Emotional Geographies of Chris Jordan's Midway*  
Kathryn Gillespie

*Sand, Sky, Bottle Caps, and Bird Bones: Recovering the Animal in Chris Jordan's Visualisations of Marine Plastic Pollution*  
Micha Gerrit Philipp Edlich

*Dead Nature: Repackaging the Still Life*  
Catherine Barcan

## Week 2: July 3-July 7

**Keynote:** *Governed by Plastic*  
Professor Gay Hawkins

### Panel 4: Packaging, LCA, and Design

*Maui's Ark*  
Stephen Harris

*The Importance of Promoting Healthy Eating to Solve the  
Plastic Pollution Problem*  
Anna Dawson

*Plasticized*  
Katarina Dimitrijevic

### Panel 5: Representations/Aesthetics

*The (Trans) Cultural Life of Plastic Waste: Eco-documentary  
Plastic China (2016) and Global Environmental Injustice*  
Kiu-Wai Chu

*Plastics, Pollution, Art and Activism: Artists who Denounce the  
Impact of Plastics on the Environment*  
Gala Arias and Hernando Gómez

*The Petroleum Magma*  
Marina Zurkow

### Panel 6: Materiality One

*The Inescapable Plastics of Being? On Extricability, Care, and  
British Hedgehog Death-by-Plastic*  
Laura McLauchlan

*Plastiglomerate: New Materialism and the Anthropocene*  
Christina Gerhardt

*Plastic Waste Flows Between Us*  
Bella Adams and Joanna Croft

## **Panel 7: Marine Plastics**

*What Sticks, What Leaches: Human Health Implications of  
Plastic Marine Debris*  
Sasha Adkins

*Dawn of the Plastisphere: Problematizing Plastic in the Ocean  
as Emerging Naturecultures*  
Sven Bergmann

*Wastelands: An Oceanography of Trash*  
Petra Beck

**Week 3: July 10-14, 2017**

**Keynote:** *The Long-term Impact of Plastics on Human and Ecosystem Health*  
Professor Ian Shaw

**Panel 8: Fabrics**

*Materials that Linger: A Geographical Biography of Polyester Fabrics*  
Elyse Stanes and Chris Gibson

*Weaving Solutions to Microfibre Pollution: The Social Practices of Apparel Production, Consumption, Wearing, and Washing*  
Lisa Heinze

*Material Design: Science, Culture, Society*  
Faith Kane

*Space Between: Circular Fashion Systems*  
Jennifer Whitty

**Panel 9: Waste Management**

*Addressing the Issue of Bio-Material Contamination in Commercial Composting*  
Johnathon Hannon

*Evaluating Sustainable Practices at Christchurch City Council Events: Analysis of Waste Diversion and Event Attendees Perceptions of Compostable Service Ware Initiatives*  
Emma McCone

*Plastic Debris: Recycling Options for Closing the Loop*

Isabel Cañete Vela and Henrikke Baumann

*Pollutants, Polymers and Pigments: The Material Contingencies of PET Bottles*

Tatianna M. P. Silva

## **Panel 10: Public Awareness of Marine Plastics**

*Currents of Plastic Awareness: An Anthropological Study of NGO Efforts to Create Knowledge and Awareness of Plastic Pollution in the Ocean*

Johanne Tarpgaard

*Making Sense of Plastic Pollution: A UK Study of Images, Messages and Perceptions of (Micro)Plastics*

Lesley Henderson and Christopher Green

*Plastic Pollution in Marine Environments: Trans-disciplinary Approaches Promoting Public Stewardship of Aquatic Environments*

Luisa Galgani and Steven A. Loiselle

*The Evidence to Change the Culture - Issues Around Marine Litter*

Marie Russell and Colin Moffat

## **Panel 11: Materiality Two**

*Plastic Inheritance*

Heather Davis

*Toxicity and Technofossils: An Interdisciplinary Dialogue*

Sy Taffel and Trisia Farrelly

*Making Plastics Bio- Bioplastics' Making*

Damla Tonuk



## Tēnā koutou katoa

It is our great pleasure to welcome participants from around the globe to the “Lives and Afterlives of Plastic” conference. This event was conceived as a forum to facilitate an interdisciplinary dialogue on the social and environmental issues that surround plastic. We hope that the work done at this conference will encourage collaborations that cross boundaries between the sciences, social sciences, arts, and humanities.

This conference is fully online, and aims to be nearly carbon neutral. While traditional conferences involve academics flying from all over the world to a specific venue, emitting huge amounts of fossil fuels into the stratosphere, an online format means that there are no carbon costs associated with transportation. There are still significant ecological issues surrounding the mineral extraction, manufacturing, waste disposal, and energy costs of the computational and networking technologies required for an online conference. However, unlike the carbon emissions associated with travel to a venue for a conference, the costs associated with computers, cameras, and undersea fibre-optic cables do not correspond to a one-off event; they will continue to be used long after the conference finishes. Indeed, when the University of California, Santa Barbara attempted to calculate the relative carbon costs of online and in-person conferences, their conclusion was that an online event reduced the carbon footprint by around 99%.

For each of the three weeks the conference is live, there will be one keynote speaker and several panels running. Each panel will have its own webpage consisting of the video presentations that have been submitted by presenters. Each panel will go live on the week scheduled in the conference programme. Each panel of video presentations will be accompanied by a comments section. The comments section for each panel will be open during the week that panel is programmed to go live. After that week, we are not expecting presenters to be checking the page for comments to respond to, and hope the focus of the conference moves towards the next set of panels. This means that presenters are able to receive more substantive feedback on their presentations than is common at traditional conferences. Following the third week of the conference, we will have a plenary discussion, with the aim of catalysing future collaborations and reflecting upon the format of the online conference.

We hope the presentations and subsequent discussions open up new conversations, perspectives and debates about the lives and afterlives of plastics.

Ngā mihi nui

Trisia Farrelly, Sy Taffel, and Lisa Vonk

# Keynote Presenter: Professor Richard C. Thompson

Plymouth University, UK



**R**ichard Thompson is Professor of Marine Biology at Plymouth University, UK. He specialises in the ecology of shallow water habitats. He obtained his first degree from the University of Newcastle upon Tyne in 1992, followed by a PhD from Liverpool University in 1996. Much of his work over the last decade has focused on marine debris with numerous publications on this topic. In 2004 his team reported on the presence of microplastics in the environment in the journal *Science*. Subsequent research examined the extent to which microplastics were retained upon ingestion and potential for microplastics to transport pollutants to organisms. He was lead guest editor for a 200 page volume of the scientific journal *Philosophical Transactions of the Royal Society*, focusing on *Plastics the Environment and Human Health*. He is a co-author of the European Union Marine Strategy Framework Directive text on marine litter and has recently prepared reports on this topic for the United Nations Global Environment Facility. In 2014 he presented his research to the US Secretary of State, John Kerry, at his Our Ocean meeting in Washington. His recent research contributed to parliamentary discussions on legislation to prohibit the use of microbeads in cosmetics.

## *Marine Debris: Are There Solutions To This Global Environmental Problem?*

**Professor Richard C. Thompson**

**M**arine debris is a growing environmental problem. It is widely distributed at the sea surface, on the sea bed and on shorelines. The around 75% of this litter is plastic, with other materials such as glass and metal representing only a small proportion of litter in the oceans. Nearly 700 species are known to encounter marine litter, with many reports of physical harm resulting from entanglement in and ingestion of plastic debris.

**I**t is widely acknowledged that plastic litter does not belong in the ocean. It is also clear that the numerous

societal benefits that are derived from everyday use of plastics can be achieved without the need for emissions of plastic waste to the environment. Around 8% of world oil production is currently used to make plastic items and there is recognition that we need to change the way we produce, use and dispose of plastic items. In this regard a solution to two major environmental problems, our non-sustainable use of fossil carbon (to produce plastics) and accumulation marine litter probably lie in utilizing end-of-life plastics as a raw material for new production.



Chris Jordan, still from *Midway: Message from the Gyre*

# Keynote Presenter: Professor Gay Hawkins

Western Sydney University



Gay Hawkins is a Research Professor in Social and Cultural Theory at the Institute for Culture and Society, a leading interdisciplinary research centre based at Western Sydney University. Her research focuses on the interactions between environments, materials and cultures. She is internationally recognized for her work on everyday waste practices and the ways in which changing material and economic practices have provoked new habits. In 2005 she published *The Ethics of Waste* a book that examined the materialities of waste and the ways in which it makes ethical claims on us. This book has had a major influence on the development of ‘Discard Studies’ a vibrant and growing international research field. Since 2008 a key focus of her work has been the rise of plastic as a mundane material and the profound cultural, environmental and political impacts of this material transformation. In 2015 she published, with colleagues Kane Race and Emily Potter, *Plastic Water – the social and material life of bottled water* (MIT Press), a global analysis of how the rise of the PET bottle has reconfigured water qualities and interfered with the struggle for safe mass supply. She is currently completing a major study into the introduction of plastic food packaging post WWII called *The Skin of Commerce*.

## *Governed by Plastic*

Professor Gay Hawkins

Much of the activism around plastic focuses on encouraging consumers to Say No to the use of certain items or regulating to ban them. These strategies imply that reducing demand will be politically effective in tackling the massive impacts of plastics waste and pollution. This denies the multiplicity of situations in which consumers have no choice but to accept plastic and the ways in which plastic is infrastructural to so much economic activity.

This paper argues that it is necessary to shift attention from governing plastic to how we actually came to be governed by it. Using the example of



Cath Barcan *Still Life*

# Keynote Presenter: Professor Ian Shaw

University of Canterbury, New Zealand



Ian Shaw is an author, broadcaster and academic. He has worked in government science, the pharmaceuticals industry and in several universities. He rose to the dizzy administrative heights as Pro Vice-Chancellor (Science) at the University of Canterbury, until he defected to the world of real science in 2009. He is now Professor of Toxicology at the University of Canterbury. Ian is the author of three books on food and the environment, edited a major work on estrogen mimics in food, a feature writer for The Press, a regular on Radio NZ National's This way Up and TV NZ (What's Really in Our Food?), and has published over 100 articles in scientific journals. His research interest for the past 20-years has been the cellular and human effects of estrogen mimics in food and the environment, with particular reference to environmental estrogens from plastics and their impact on human and ecosystem health.

He is a fellow of the Royal College of Pathologists and the Royal Society of Chemistry. He won the NZ Association of Scientists Science Communicator Award in 2009, but is most proud of being awarded Science Lecturer of the Year by the University of Canterbury Student's Association in 2009, 2013, 2014 and 2016.

## *The Long-Term Impact of Plastics on Human and Ecosystem Health*

Professor Ian Shaw

The huge benefits of plastics have meant that their risks have not, until recently, been fully realised and set in the context of benefit. The scientific evidence for environmental and human health risks is overwhelming which has led to a concerted lobby to minimise plastics use and, if possible to replace plastics with other, less risky, materials if possible. What are the long term risks of plastics to us and our environment? Do they warrant, do the risks warrant the significant anti-plastics sentiment that is growing apace?

In his presentation Ian Shaw will explore the effects of plastics on the environment and human health. He will look at the key roles of plasticisers in plastics manufacture and their implications as sex hormone mimics for both humans and animals. He'll outline the environmental degradation of some plastics and the degradation products' impacts on environmental health. Finally, to strike a balance, the benefits of plastics – particularly in the food industry – will be explored and these benefits set in the context of the steadily increasing risk profile of many of the most commonly used plastics.



**Max Liboiron**

Civic Laboratory for Environmental Action Research  
Memorial University of Newfoundland

Citizen science, where ordinary people are part of scientific research design, data collection, and/or data analysis, can be a way to make science accountable to public concerns, not just in terms of what is being researched, but how it is being researched. Civic Laboratory for Environmental Action Research (CLEAR), is a feminist marine science laboratory that foregrounds values of equity, place-based knowledge, and ethical politics in all aspects of scientific research.

This presentation will introduce: some of the do-it-yourself, open source monitoring devices we've invented (a suite of neuston trawls, a passive sampling device for rocky shoreline microplastics); our citizen science plastic ingestion protocol for fish caught for food, including tests we've done comparing citizen science analysis of plastic ingestion rates to accredited science rates; and our methods of community peer review. In each case, we will outline how these devices and practices come out of a commitment to community concerns, feminist ethics, interdisciplinary collaboration

between scientists, community members, and social scientists, and place-based knowledge. We will conclude with a summary of best practices that can be used in a variety of research contexts.



*Dr. Max Liboiron directs the Civic Laboratory for Environmental Action Research (CLEAR), a feminist marine science and technology laboratory. Liboiron's research bridges the natural and social sciences in its investigation of how marine plastics are represented in science and how these methods of representation relate to action. Liboiron is managing editor of Discard Studies, a member of the Endocrine Disruptors Action Group, and a co-organizer for the Gathering for Open Science Hardware (GOSH).*



# *Microplastics Identified in Deep-Sea Water and Ingested by Benthic Invertebrates: A Quantification and Characterisation*

Jessica Melvin

University Centre of the Westfjords

The lack of marine plastic pollution monitoring procedures suited to subarctic conditions and communities intensifies the disproportionate burden of pollution faced by low income, northern, rural communities where the reliance on country foods for sustenance is common. In an attempt to develop marine plastic monitoring procedures for the subarctic island of Newfoundland, Civic Laboratory for Environmental Action Research worked together with local fishers to collect the gastrointestinal (GI) tracts of recreationally and commercially caught Atlantic cod (*Gadus morhua*), an important food fish of high cultural value in the region. GI tracts were collected directly from fishers during the filleting process, a method that allowed researchers to sample directly from the human food web. Following the visual inspection of GI tracts for plastics greater than 1 mm in size, 2.01% of individuals sampled were found to contain marine plastics.

This research quantifies plastic ingestion in Atlantic cod from the Northwest Atlantic (an area that has seen little in plastic ingestion research directed at the human food web), and identifies feeding habits that may put Atlantic cod at risk for plastic ingestion. The methodology was developed to sample fish destined for human consumption, while providing protocols that can be easily replicated by citizen scientists in the future. This presentation will cover both the citizen science methods used to collect samples, as well as the findings obtained through this method.



*Jessica Melvin is a graduate student with the University Centre of the Westfjords (Iceland), where she is completing a master's degree in Coastal and Marine Management. As a member of the Civic Laboratory for Environmental Action Research (CLEAR) at Memorial University of Newfoundland, her research focuses on the monitoring of marine plastics through grassroots, citizen science methodologies.*

*A Review of Marine Plastic Pollution in the Environment of  
Newfoundland and Labrador, Canada*

**Ammendolia, J., Liboiron, F., Bradshaw, H., Dawe, N., Melvin, J., Novacefski,  
M., Saturno, J., Wells, E., Mather, C., and Liboiron, M.**

Presenting author: Justine Ammendolia  
Memorial University of Newfoundland

**A**lthough the province of Newfoundland and Labrador (NL), Canada, is nearly the size of California and its people depend on the ocean for food, there has never been a systematic plastics review of the region. In fact, marine plastic pollution is not usually studied holistically within the context of geographic regions. This has limited our understanding of plastic pollution in the total environment, across media and sampling techniques. Our research provides the first review of the available knowledge regarding plastic pollution in NL. We present a methodology that other regions could follow to conduct systematic surveys of their respective areas. We summarize across: (1) study methods and (2) types and quantities of plastic debris identified across the landscape of the province. Our data includes 34 investigative reports published and unpublished) dating from 1968 to the present and synthesized data from the following techniques: bio-monitoring, diving surveys, surface trawls, and citizen science shoreline identification.

**R**esults indicate that there is regional and cultural bias associated with the geographic locations sampled and the methods used for studying plastics (e.g. bird ingestion studies over fish ingestion studies). At the same time, results also show a regional and cultural specificity for the type of plastics present in the region (e.g. fishing gear). As there is no provincial monitoring program for plastic pollution, this research not only establishes the groundwork for future monitoring programs, but also provides a methodology for other regions to synthesize diverse and uneven monitoring effects.

## *Microplastics Identified in Deep-Sea Water and Ingested by Benthic Invertebrates: A Quantification and Characterisation*

Winnie Courtene-Jones, Quinn, B., Gary, S.F., Mogg, M.,  
and Narayanaswamy, B.E.

Scottish Association for Marine Science (SAMS)

**M**icroplastics are widespread in the natural environment and present numerous ecological threats. While the ultimate fate of marine microplastics are not well known, it is hypothesized that the deep sea is the final sink for this anthropogenic contaminant. This study provides an assessment of microplastic pollution ingested by benthic macroinvertebrates with different feeding modes and in adjacent deep water (> 2200 m) in the Rockall Trough, Northeast Atlantic Ocean. Despite the remote location, microplastics were identified in deep water at a concentration of 70.8 particles m<sup>-3</sup>, comparable to that in surface waters. Additionally 48 % of the invertebrates examined ingested microplastics with quantities enumerated comparable to coastal species. The number of ingested microplastics differed significantly between species ( $H = 7.0629$ ,  $df = 2$ ,  $p = 0.0293$ ). A fitted general linear model revealed covariates associated with an individual's size, length ( $p = 0.633$ ), mass ( $p=0.002$ ) and weight:length ( $p=0.016$ ) interaction, explained the variance in ingested microplastic number, rather than effects of feeding mode. Deep-sea microplastics appeared highly degraded with surface areas more than double that of pristine particles. The identification of synthetic polymers with densities greater and less than seawater along with comparable quantities to the upper ocean indicate complex processes of vertical redistribution. This study provides novel insights into microplastic pollution in the Rockall Trough deep-sea ecosystem; further sampling efforts should be directed to the deep oceans globally to establish the prevalence of microplastic pollution in this remote and largely unstudied ecosystem.



*Winnie joined the Scottish Association for Marine Science (SAMS) in 2015 to commence a PhD researching microplastic pollution in the deep sea ecosystem. Her research interest focuses on the transport, long-term fate and sequestration of marine plastics, specifically microplastics, in the environment. Winnie adopts a multidisciplinary approach to her research questions and is passionate about disseminating her findings to wide and diverse audiences. While at SAMS she has participated on research cruises in the North Atlantic Ocean to sample the deep sea.*

*Impacts of Microplastics on Commercial Mussels in a Warmer, More Acidic World*

**Nova Mieszkowska**

University of Liverpool

The Marine Biological Association of the UK

**Gianluca Sarà**

Università di Palermo

Coastal marine habitats form the interface between terrestrial and marine systems, and intertidal species are highly sensitive to changes in their environment. Long-term time-series of rocky intertidal habitats around the UK dating back to the 1950s have shown some of the fastest responses to climate change in any natural system. In addition, they are impacted by ocean acidification, exacerbating climate-driven shifts. Microplastics are an anthropogenic stressor that is more local to regional in origin, but is also now impacting physiological performance of intertidal species. The blue mussel, *Mytilus edulis/galloprovincialis* hybrid is of commercial importance and occurs across large areas of the UK and European coastline. *Mytilus* has shown changes in survival and morphology in long-term experiments, with increasing impacts when mussels are exposed to temperature, ocean acidification and microplastics in multiple-stressor treatments compared to single stressor exposure. New Dynamic Energy Budget models are able to calculate the survival and physiological performance of *Mytilus* across future scenarios for climate change, ocean acidification and microplastics, proving new, biologically-relevant mechanistic Species Distribution Models that can forecast both biogeographic range shifts, and areas of vulnerability within the range for the first time.

## *Agglomeration of Nano and Microplastic Debris in Seawater by Bacterial Exopolymers*

Stephen Summers,

Tony Gutierrez

Theodore Henry

Heriot-Watt

The rise in single-usage plastic has resulted in a global pollution problem, with a presence of plastic debris on the shores of all seven continents. Plastics can be released into the environment as small particulates, or formed as such from larger pieces by fragmentation into smaller microplastics through mechanical abrasion and UV irradiation. The resulting microplastics (<5 mm) interact with microorganisms and their produced exopolymers in the environment to form a dynamic agglomerate habitat composed of biofilms, organisms, and numerous substances and particles undergoing sorption/desorption processes with the agglomerates. The formation of biofilms is a key feature of microplastic agglomerates present in the environment, and have implications on the ultimate fate and behaviour of the plastic debris. To improve our understanding of this, we investigated the formation of microplastic agglomerates and their behaviour in sea water. Microplastic agglomerates were formed in synthetic seawater by addition of various concentrations of exopolymers produced by marine bacteria. Increases in exopolymer concentration resulted in larger agglomerates of microplastic debris. Agglomerates formed with polystyrene microplastics showed no correlation between their sedimentation velocities and the amount of nano or microplastic particles that were incorporated into the agglomerates. Since nano and microplastics readily, and within very short time scales, formed agglomerates in seawater – likely initiated or triggered by the presence of microorganisms and their produced exopolymers – it is important to take into consideration the behaviour, fate and impacts of these micro-scale plastic pollutants when in agglomerated form.

*Stephen Summers is a post-doctoral researcher at Heriot-Watt University, Edinburgh and is working as part of the Real-Risk-Nano team, (<https://epaquatic.org/realrisknano/>). This project aims to examine the potential risks that may be associated with nanoplastic particles in the marine environment. Stephen has been working on marine plastic debris since 2013, on various projects, ranging from the effect microplastics can have on ecosystem function to the biodegradation of plastics in managed and natural environments. In his current role, Stephen is investigating the complex relationship between microorganisms and plastics that have coagulated together in a marine snow aggregate.*



Natalie Richárd

Memorial University of Newfoundland  
Civic Laboratory for Environmental Action Research (CLEAR)

Microplastics in the ocean are now widely recognised as a serious threat to the ocean environment, marine organisms and humans who consume fish polluted with plastics. Logistically it would be impossible for one or even several agencies to locally monitor all marine species for ingested plastic without community involvement, utilizing a citizen science monitoring program. However, to understand if citizen scientists can successfully locate and identify marine plastics in GI tracts of Atlantic cod we compared the success and identification rates among several methods ranging from an expensive chemical laboratory method to a cost effective citizen science kit. The four methods are as follows: Method 1: 10% Potassium hydroxide (KOH) and visual analysis using a dissecting microscope with full laboratory; Method 2: visual analysis with dissecting microscope with full laboratory; Method 3: citizen science dissecting kit in laboratory; and Method 4: citizen science dissecting kit in the field.

We found KOH was the most successful locating and identifying plastics (success rate: 94%; identification rate: 100%), however, when a biochemical laboratory or scientific tools are not available an alternative method would be to use Method 4 (success rate: 71% identification rate: 86%). The results for citizen scientists using Method 4 were not distinguishable, from scientists using Method 2 or 3 (success rate: 67%; 59%; identification rate: 76%; 90%) indicating citizen scientists can be relied upon as a resourceful approach to monitoring marine plastics in fish.



*Natalie Richárd began her scientific career in marine conservation conducting aerial research on endangered Cook Inlet beluga whales in Anchorage Alaska, which identified consistent trends in seasonal spatial persistence to prevent anthropogenic disturbances. While earning her masters at Memorial University of St. John's Canada Newfoundland, she investigated if citizen scientists can successfully locate and identify marine plastics in gastrointestinal tracts of Atlantic cod and also established a baseline for plastic ingestion for offshore Atlantic cod and inshore capelin. Natalie's goals are to work within either federal or state government to achieve conservation through policy change.*

*Witnessing the Afterlives of Plastic: The Emotional Geographies of  
Chris Jordan's Midway*

Kathryn Gillespie  
Wesleyan University

In his photographic exhibition *Midway: Message from the Gyre*, Chris Jordan documents the afterlives of plastic waste where it ends up in the bellies of fledgling albatrosses on the southern Pacific island, Midway Atoll. The consumption of bits of plastic kills thousands of these birds; what is left behind when they die is a body decomposing to reveal bellies full of plastic waste that permeates the Pacific Ocean and its islands. In this paper, I center Jordan's *Midway* to theorize the emotional geographies of witnessing the afterlives of plastic. *Midway* documents the indirect forms of killing that occur in the afterlives of plastic; in this way, Jordan bears witness to the violence of plastic consumption through the documentation of the deaths occurring at Midway, and the project as a set of visual artifacts requires that the viewer of the photographs also becomes a witness.

The photos are at once beautiful, arresting, and devastating, demanding an emotional response and a way of connecting the viewer with the distant impacts of the consumption practices in which the viewer is intimately implicated. In teaching, I bring in *Midway* as an example of the impacts of waste and the proliferation of plastic in capitalist economies of consumption. In what geographers call 'caring at distance,' *Midway* prompts emotional responses of grief, disgust, and care, and represents a mode of connecting to distant others whose lives and deaths are shaped by plastic waste.



Chris Jordan, still from *Midway: Message from the Gyre*

## *Dead Nature: Repackaging the Still Life*

Cath Barcan

TAFE NSW- Western Sydney



This presentation is heavily weighted as a visual argument surrounding the seductive and confounding use of plastic packaging in the commercial sale of food, and the presence of plastic packaging as a ubiquitous part of the contemporary shopping experience. The presentation is a combination of my fine art photographs, a discussion of their art historical antecedents, and an analysis of their relevance today. As a contemporary fine art photographer, my interest in creating still life images was initially formal and contemplative. As I continue to work with the still life genre, my intention is to produce images that not only reach back in time to reference their visual antecedents, but move beyond a romanticised depiction of familiar subject matter by acknowledging contemporary plastic packaging realities.

Still life painters of the Dutch Golden Age created images that grappled with issues of mortality, permanence and impermanence, and these messages continue to have relevance today. Using traditional visual language, I hope to create and share a contemporary dialogue that emphasizes the nexus of the everyday with these larger issues. Participation in this conference would provide the opportunity to network and dialogue with other practitioners working with these messages in a range of other professional contexts. I would greatly value the opportunity to collaborate with others in this field who are working in a non-visual way.



*Cath Barcan has exhibited widely in Australia as an artist for more than twenty years. Her practice is largely based in photography, with a current research interest in contemporary still lives, and their historical antecedents. Her work is concerned with notions of the sublime and the banal, and the places where they cross over. Barcan holds a MVA from Sydney College of the Arts, University of Sydney. She has taught photography in many locations including the University of Tasmania, and is currently Head Teacher of Fine Arts at Nepean Arts and Design Centre, TAFE NSW- Western Sydney.*



Micha Gerrit Philipp Edlich  
Leuphana Universität Lüneburg

In recent years, American photographer and filmmaker Chris Jordan has aimed to visualize what cannot be visualized and thus can be neither fully comprehended nor ethically considered. In the first installment of *Running the Numbers: An American Self-Portrait*, a series of digitally manipulated images begun in 2005 and collected in print format in 2009, Jordan interrogated, sometimes with acerbic wit, the excesses of an insatiable consumer society and grappled with the mind-boggling statistics that are commonly used to capture and, to some extent, mask the magnitude and detrimental impact of (late-)capitalist phenomena such as GMC Yukon Denalis or Barbie Dolls. In 2009, Jordan started a related and yet conceptually and aesthetically very different project to represent a major environmental problem that is literally out of sight, beneath the surface: *On the Midway Islands*, Jordan began to photograph and film young seabirds that were either painfully dying or had already slowly suffocated after being fed random pieces of plastic that their parents had collected in the so-called trash vortex, a remote area in the North Pacific the size of Texas filled with flotsam and jetsam. To the casual viewer, these haunting images, particularly the close and close-up shots of decomposing bird cadavers, their chests stuffed with gaudy, plasticky debris, evoke conflicting emotions similar to those triggered by, to give but one example, Emmet Gowin's austere black-and-white aerial photographs of the lunar landscapes of the Nevada Test Site. Jordan's macabre tableaux also issue a challenge to scholars in the fields of visual studies, discard studies, environmental literary and cultural studies, and animal studies, as they point to an issue that has been, particularly in comparison to other long-term, large-scale, but similarly elusive environmental problems such as radioactive waste, toxic pollution, or global climate change, underestimated and neglected. Jordan's photographs and film project not only pose pertinent and timely questions concerning ignored but nonetheless pressing environmental concerns such as ubiquitous and highly mobile plastic trash, but they also challenge viewers to consider how spatially removed, inaccessible, and hence invisible problems such as the trash vortex can be visualized, comprehended, and ethically considered. In addition to the issue of mediation, his pho-

tography and film project *Midway: Messages from the Gyre* thus highlights questions of affect, ethical regard and responsibility for human and nonhuman animals, materiality and embodiment, or (global) (inter-)connectedness in contemporary environmental(ist) discourses. An investigation of these concerns in particular and Jordan's project in general, particularly in the light of recent discussions of "rubbish ecology" (Patricia Yaeger's term) in *American Studies*, trash and waste in ecocriticism (cf., for instance, Heise or Phillips), the visual turn in environmental literary and cultural studies (cf., for example, Dobrin and Morley), and, more specifically, animal death in animal studies (cf., for instance, Johnston and Probyn-Rapsey) is long overdue, and this contribution aims to address this gap in the literature. By pondering the disturbing finds of Jordan's photographic and filmic beachcombing mission in *Midway* vis-à-vis a variety of related cultural representations, for instance online travel blogs or scientific papers dealing with mobile trash and trash vortex, this contribution not only attempts to trace and theorize the gradual emergence of an exemplary environmental problem in contemporary media as well as from specialist to public discourses, but, perhaps more importantly, also to extend the recent work by Chia-ju Chang at the intersection of waste studies and critical animal studies. In other words, it not only attempts to gauge the possibilities and potential pitfalls of transformation, magnification, and distortion that an interventionist artistic project such as Jordan's necessarily entails, but it also aims to prevent the erasure of the vulnerable animal body from the anthropocentric record. Ultimately, this contribution seeks to offer an alternative to the general perception of Jordan's photographs as anthropocentric *memento mori* by insisting on the spectral presence of animals amidst accumulations of human trash.

## *Maui's Ark* Stephen Harris

The proliferation of plastic has so outstripped the means of controlling its disposal that disjointed or piecemeal approaches to mitigating its effects hold out little hope of turning the tide and building durable solutions. By contrast, the 'Plastic Chain' proposes an integrated approach: by charting the sources, users, disposers and losers in the life cycle of plastic, the Plastic Chain aims to identify the drivers of demand for plastic, the points at which choices are made among alternative products and packaging and the incentives, sanctions and potential intervention points for both industry and public policy. In so doing, the Plastic Chain provides a networking and action map for all who care about the harm caused by plastic and are motivated to contribute to solutions, among them:

- Manufacturers of plastic products and of plastic packaging who are currently confronted neither with the full costs of indiscriminate plastic use nor sufficient incentives to find alternatives;
- Economists seeking to measure the true economic value and environmental costs of plastic, to enable true comparisons with alternatives;
- Consumers whose demand patterns and responses to marketing ultimately perpetuate the Plastic Chain;
- Firms either unaware of, or insufficiently accountable for, the full costs of their plastic consumption against possible alternative products or ways of doing business;
- Communities, NGOs, recreational groups and

- activists wishing to raise awareness, mobilise action and create pressure for political change;
- Iwi and Māori business concerned to instill kaitiakitanga (whole of life stewardship) in the way plastic is used and its disposal managed;
- An innovative Auckland company that can sequester commingled, dirty plastic in concrete, creating an economic 'good' from an environmental 'bad';
- Artists, writers and IT innovators who can inspire a wider vision and magnify that through digital technologies;
- Scientists and researchers examining the ecological impacts of plastic and developing new, less harmful alternative materials;
- Local councils seeking to reduce plastic litter, landfill and disposal costs – and to implement regulations to reward progress and penalise polluters;
- Central government agencies devising policy to encourage responsible practice.

Understanding what contribution each party makes to breaking in the Plastic Chain is the key to effective action. New Zealand can demonstrate how an integrated approach can effectively break its bonds and provide an example to other countries grappling with similar challenges – but in most cases on a much greater scale. In my presentation, I will describe my conception of the Plastic Chain graphically and in detail, identify key participants representing every one of its links, how they intend to take action – and what more needs to be done to ensure collaboration delivers the greatest impact.

*Stephen Harris is Director of South and South East Asian Affairs at the Ministry of Foreign Affairs and Trade and is based in Wellington. His interest in reducing the damage of plastic, particularly to marine environments, is personal and not related to this role.*

## *The Importance of Promoting Healthy Eating to Solve the Plastic Pollution Problem*

**Anna Dawson**

Plastic Free Philippines

**D**ue to the lack of waste management infrastructure in developing countries beach clean-ups yield high volumes of plastic. In late 2016 I cycled 2000km along the Philippines coasts, on a bamboo bike, to raise awareness about the need to reduce plastic in our oceans. I gave 14 presentations in schools and universities, as well as mobilised 1000-odd volunteers for 31 beach clean-up activities. This provided an opportunity to analyse the biggest contributors to marine debris and the key areas where change is needed. The Philippines is ranked the third biggest contributor to ocean plastic. In the 2015 Ocean Conservancy clean-up food wrappers were the main item collected from the Philippines' coastlines. My observations and data showed 20-40% of material collected was snack food packaging. These plastic-packaged snacks are consumed by all socio-economic groups within the population of 100 million, due to their low cost. A medium sized packet of chips (at 8 pesos/0.16USD) is cheaper than most pieces of fruit.

**I**f we want to reduce plastic pollution in developing countries then 'snack-healthy' campaigns will be beneficial. A challenge for developing countries is the way packaged foods are tied to the concept of western-style development and therefore desirable. Plastic pollution and the way we eat are so intrinsically intertwined, that we need to think about both in unison to tackle this global problem. At the product stewardship end of the equation, research into keeping foods fresh with alternative packaging is paramount.



*Anna Dawson is a New Zealander who has spent much of her working life based in the Philippines. In 2008 she transferred to the country as a Civil Engineer. Her most shaping experience was sailing from New Zealand to the Philippines in 2014. Throughout this trip she completed a Postgraduate Diploma in International Development. Anna recently cycled 2000km through the Philippines to raise awareness about the threat of marine debris. Along the way Anna organised beach clean-ups and talks, mobilising volunteers to collect 500 sacks of plastic. Anna's interests lie in developing country solutions to reduce plastic pollution.*

*Plasticized*  
Katarina Dimitrijevic  
University of London

**W**e live in a plastic debris society, as in the first decade of the twenty-first century, plastic production has quadrupled in comparison to the previous one. Recycling of used Plastic Limited informs that over one and half million tons of mixed household plastic packaging is disposed of in landfill each year in the UK only (RECOUP, 2012). There is now compelling evidence to show that humanity's impact on the Earth's atmosphere, oceans and wildlife has pushed the planet into a new geological epoch, the "Anthropocene". From the scientific axiom, the new term acknowledges current human dominance of biological, chemical and geological processes on Earth. Currently, the planets oceans form the largest global landfill and are the most vulnerable unprotected eco-system on Spaceship Earth (Fuller, 1963). Contemporary marine research has revealed that synthetic polymers are toxic pollutants and they are spread throughout all the planets oceans. Right now, 269,000 tons of plastic composed of 5.25 trillion particles are afloat at sea (Eriksen, et al., 2014). The plastic trash that flows into the ocean originating from the United States and Europe is due to urban and coastal litter rather than the mishandling of collected waste (Cassouto, 2015).

**T**he United Nations joint group of experts on the scientific aspects of marine pollution (GESAMP) estimated that land-based sources account for up to 80 percent of the world's marine pollution, 60 percent to 95 percent of which is plastic debris. Transposed by wind, the majority of land-littered waste ultimately ends up at the ocean. As the society I/We have created the place and space for the birth of the new environ-bio layer, named the "Plastisphere" (Zettler, et al., 2013). How can we transgress the surplus driven consumer culture? Perhaps in taking on the seemingly valueless discarded plastic; in transposing plastic things into a floating objects and 3D installations. Plasticized, KraalD land installation can reveal how disposed materiality can contain a dimension for spaces of possibility, creating new values and even hope for a Global and Planetary 21st century depollution. Thus, it feels as a personal imperative call, to all human collective that in order to raise new planetary paradigm, I/We need to start fundamentally transposing the way we design, manufacture, distribute, consume and dispose in our toxic futures.



*Katarina Dimitrijevic, is an interior architect, educator, design activist and researcher. She has led and taught postgraduate and undergraduate university programmes in MA Design, UK; Interior Design and Interior Architecture in South Africa. Presently engaged as graduate student at Goldsmiths, University of London, funded by Design Star Centre for Doctoral Training, AHRC, UK. Katarina is principal member at KraalD, committed promoting design as a vehicle for social transformation. KraalD is a research praxis, embedded in a social narrative which strives to journey beyond the product design vocabulary, exploding the design advocacy framework within socio-cultural, environmental, ethical and critical discard topics..*

# *Can Citizen Scientists Identify Microplastics Ingested by Atlantic Cod? A Single Blind Comparison Across Four Methods*

Gala Arias

Hernando Gómez

Europea de Madrid

Plastic is everywhere—in our oceans, deserts, and rainforests. Wild animals feed on it, become entangled in it, die because of it. But they are not alone; some artists want to show us the effects of our throwaway lifestyle. Starting with Chris Jordan, followed by Mandy Barner and many others, we explore a number of artists that use their weapons to denounce the effect of plastic on our planet's wildlife and on our environment in general. We aim to analyze their different styles of denunciation and their aesthetic perspective on the situation.

When compiling these artists we selected those who give preference to discursive emotion yet nevertheless do not allow artistic expression to eclipse their urge to denounce. Although it is impossible not to follow certain aesthetic rules, the chosen artists never put form before the message they seek to convey. We analyze the hidden details of their aesthetic expression –materials, composition, styles– in relation to the environmental problems they denounce, offering data and a scientific explanation.



Translator of Russian, Polish and English. Degree in Slavonic Philology by the Universidad Complutense de Madrid. Postgraduate in Publishing by the Oxford Brookes University and Master in Lexicography by the University Carlos III of Madrid. PhD in Environmental Humanities by the University Carlos III de Madrid. Translation professor in the Faculty of Social Sciences and Communication at the European University de Madrid, in recent years she has specialized in research and training in sustainable consumption.



Ex Graphic reporter, Photographer and Lecture in Aesthetic and Photography at Universidad Europea de Madrid (Spain). Phd in Arts (European Mention) in Photography and image construction (Universidad Complutense de Madrid). His specialty is focus on poetical image construction and photographic languages. He covered breaking news and Special Events news as camera operator for more than 14 years.

## *The (Trans) Cultural Life of Plastic Waste: Eco-documentary Plastic China (2016) and Global Environmental Injustice*

Kiu-Wai Chu

University of Zurich

*“We definitely don’t see these over here. We don’t see material sitting in the water, or any runoff being discarded in the river. We don’t see any plastic burning. We don’t see any of the regional health effects...”* (Daniel Maher, director of a US recycling company).

Chinese eco-documentary *Plastic China* (dir. Wang Jiuliang, 2016) explores the subject of plastic waste processing by interviewing people who “make money out of trash”, namely the plastic recycling companies in the West, and the poor village workers in China who handle plastic wastes as their daily routines. Through these juxtapositions of visual images, we begin to see the invisible connections between the seemingly separate worlds, and the intensifying global environmental injustice and divide that is taking place in a scale never before.

By drawing from recent ecocritical discussions in eco-cosmopolitanism (Heise 2008); slow violence (Nixon 2011); “transcorporeal subjectivity” (Alaimo 2017) of human/plastic entanglements; and ecology as “storied matter” (Iovino & Opperman 2013), I aim to examine the cultural life of plastic waste in the global capitalist world today, and tackle questions on visual media’s role in today’s environmental issues: How does a transnational eco-documentary like *Plastic China* raise global awareness towards, and facilitate better cross-cultural dialogues, on the subject of plastic waste? How does the film make visible the entangled lives of humans and plastic matters? How can multidisciplinary initiatives between filmmakers/artists and environmental humanities scholars be facilitated, in order to promote transnational environmental awareness?



*Kiu-wai Chu is Postdoctoral Fellow in Institute of Asian and Oriental Studies, University of Zurich. He earned his PhD in Comparative Literature in University of Hong Kong, and his previous degrees from SOAS, University of London, and University of Cambridge. He was a visiting Fulbright scholar in University of Idaho. He has taught film, media and cultural studies in University of Hong Kong, City University of Hong Kong and HKUSPACE. His research focuses on contemporary cinema and art in Asia, ecocriticism and environmental humanities. His work has appeared in Transnational Ecocinema; Animated Landscapes: History, Form and Function; Ecomedia: Key Issues and elsewhere.*

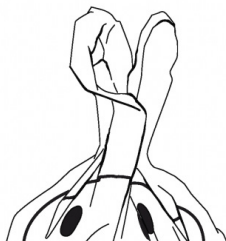
## *The Petroleum Manga*

Marina Zurkow

Artist, Professor at ITP, Tisch School of the Arts, NYU

**T**he Petroleum Manga is a book ed to either the polymer or the object. project initiated by media artist Marina Zurkow, co-edited with Valerie Vogrin, with contributions by 40 notable poets, fiction authors, scientists, and theorists. In the book, drawings of objects made from petrochemicals are organized by their primary petroleum-based designation — PP, HDPE, PIB, PET, PU, and others. Writers respond-

**O**ver a slideshow of petroleum manga drawings, poet Maureen McLane and novelist Ruth Ozeki read their contributions. The book is available for purchase or pdf download at Punctum Books.



### The Petroleum

A Project by

*Marina Zurkow is a media artist focused on near-impossible nature and culture intersections, researching “wicked problems” like invasive species, superfund sites and petroleum interdependence. She uses life science, biomaterials, animation, food and software technologies to foster intimate connections between people and non-human agents, in both gallery installations and unconventional, participatory public projects. Exhibitions include Chronus Art Center, Shanghai; bitforms gallery, NY; Sundance New Frontiers; and the Smithsonian American Art Museum. She is a 2011 John Simon Guggenheim Foundation Fellow and has received grants from NYFA, NYSCA, the Rockefeller Foundation and Creative Capital. She is a full-time faculty member at ITP / Tisch School of the Arts, New York University.*

<https://punctumbooks.com/people/marina-zurkow/>

## *Plastic Waste Flows Between Us*

Bella Adams and Jo Croft

Liverpool John Moores University

As we eat, wash, walk, work and play, we leave traces of plastic waste, or—as Serenella Iovino (2009) puts it—‘waste is the other side of our presence in the world, our absence made visible’. Yet even as we acknowledge our own entanglement with the afterlives of plastic, we cannot grasp the scale of these environmental effects because ‘every thought of waste seems either much too big or much too small’ (Thill, 2015). This collaborative paper therefore approaches the ‘hyperobject’ (Morton, 2013) of plastic from a beach-combing perspective, in order to illuminate the ecological possibilities of creative encounters with plastic waste. Through the eco-poetical prisms offered by contemporary writers and artists, we explore connections between ‘someone’s garbage, no doubt, tossed overboard or left behind after a picnic or a rave’ (Ozeki, 2013) and the sublime scale of oceanic plastic gyres.

For example, in *We Will Be Here After You’ve Gone*, Merseyside artist Marie-Louise Williams stitches jellyfish out of plastic milk cartons, while Canadian novelist, Ruth Ozeki begins her *A Tale for the Time Being* with the discovery of a barnacle-encrusted, ‘scarred plastic freezer bag’ containing a Hello Kitty lunchbox. Inside this plastic box is the journal of a Japanese teenager, apparently a ‘waste’ object from 3/11. Thus, through the language of flotsam and jetsam, we follow trajectories of discarded plastic across the ocean and back again. And we show how waste flows temporally, spatially and unevenly in ways that suggests possibilities for an environmental ethic of shared vulnerability and responsibility (Hird, 2013).



Marie-Louise Williams *We Will Be Here After You've Gone*



*The Inescapable Plastics of Being? On Extricability, Care, and  
British Hedgehog Death-by-Plastic*

Laura McLauchlan

University of New South Wales

While a chip packet can be enough to fatally entrap a hedgehog, more common rubbish-induced deaths involve various forms of plastics—cups, bottles, netting and six pack rings. With hedgehogs massively in decline in the UK, questions of how to deal with plastics are being raised by many hedgehog rehabilitators and conservationists. However, even with first-hand knowledge of the danger of many plastic products for hogs, it can be difficult to extract oneself from these flexible, everyday killers.

In this presentation, I will follow the work of Yvonne Cox, a hedgehog rehabilitator based in Yate, South Gloucester. Yvonne's education work in schools and

the community involves, in part, careful demonstration of the sorts of litter processing required to make plastics safer for hogs—cutting yogurt pottles and beer rings, breaking up tooth flossers and squashing down margarine and butter containers. Yet, during a busy day of hog care, finding the time to actually do this processing work is next to impossible. As is avoiding these products to begin with. In this paper, I will look at the (im)possibility of escaping plastics, particularly those plastics which play out in hedgehog rehabilitation. Thinking with Maria Puig de la Bellacasa, Tim Morton and Donna Haraway, I will wonder what it is to continue to care in this trouble.



## *Plastiglomerate: New Materialism and the Anthropocene*

Christina Gerhardt

**P**lastiglomerate is a term coined in 2012 by geologist Patricia Corcoran, oceanographer Charles J. Moore and artist Kelly Jazvac for stone that contains a mixture of volcanic rock and sand; other natural debris, such as basalt, coral, shells or wood; and hard molten plastic from plastic bags or bottle caps. It is, they argue in a journal published in the Geological Society of America, a sign of the Anthropocene, in that this human pollution will eventually turn up as a geologic marker of this era. The trio photographed plastiglomerate on the shores of Hawaii's big island. Patricia Corcoran is a geologist, whose work focuses on how things, particularly plastic, become sediments. Charles J. Moore is best-known for his research on the Great Pacific Garbage Patch. Kelly Jazvac has previously worked with vinyl, making art out of discarded advertising banners.

**T**his paper will present Kelly Jazvac's photographs of the plastiglomerate. It will discuss the concept of plastiglomerate, as it rests at the intersection of a geologist's, an oceanographer's and an artist's research. Taken together, the collaborative work of this trio illustrates exciting new avenues for multimedia collaborations, cutting across disciplinary boundaries, and how a collaborative project between the arts and humanities and the natural sciences, geology and oceanography, both documents and shares new tales of plastic in the Anthropocene



*Christina Gerhardt is Assistant Professor at the University of Hawaii at Mānoa. She is author of *Screening the Red Army Faction: Cultural and Historical Memory* (Bloomsbury, 2018); co-editor of two volumes: *1968 and Global Cinema* (Wayne State UP, 2018) with Sara Saljoughi; and *Celluloid Revolt: German Screen Cultures and the Sixties* (Camden House, 2018), with Marco Abel; and guest editor of *1968 and West German Cinema*, a special issue of *The Sixties* 10 (2017). Her work has been supported by the Fulbright Commission, the DAAD and Center for Contemporary History Potsdam. She has held visiting appointments at Harvard University, Columbia University, and at the Freie Universität Berlin. During the 2017-2018 academic year, she will be returning to UC-Berkeley, this time as Visiting Scholar at the Institute of European Studies, and to Harvard University's Minda de Gunzburg Center for European Studies.*

*What Sticks, What Leaches: Human Health Implications of Plastic  
Marine Debris*

Sasha Adkins  
Clark University

It has been well-established that lipophilic contaminants, such as PAHs and DDE, concentrate in plastic marine debris and thereby enter the marine trophic web. My research has explored whether methyl mercury, which is not highly lipophilic, may by a different mechanism also be concentrating in plastic marine debris. My hypothesis was that since mercury binds to mercaptans (sulfur molecules), plastics containing mercaptans may bind and adsorb meHg. The results of two pilot experiments support this. Sea water was spiked with methyl mercury, and pieces of various types of plastic were introduced. They were agitated on an orbital shaker for 72 hours and then analyzed. Styrene-butadiene block copolymer, in particular, was quite efficient at adsorbing mercury (>70% of the mercury was adsorbed within three days). Neoprene and post-consumer crumb rubber also adsorbed mercury, but less efficiently. One unanticipated result was that polycarbonate plastic leached mercury. In light of the research that is emerging, I urge us to consider not only biomagnification / bioaccumulation of toxicants, but also what I propose we call “plastic-mediated trophic accumulation” in our human health risk assessments.

*Dawn of the Plastisphere: Problematizing Plastic in the Ocean as  
Emerging Naturecultures*

Sven Bergmann

Universität Bremen

Plastic litter in the ocean (and also in fresh water) is perceived as constituting one of the most severe global ecological challenges of the day and accordingly therefore it is in the center of interdisciplinary attention. The focus of my research project is on collaborative knowledge production and material politics concerning ocean plastics. Besides purely academic/scientific modes of knowledge production, it also focuses on citizen science projects and emerging networks between scientists, environmental activists, policy makers, and the shifting and erratic materialities of plastic in the environment itself. Anthropogenic marine plastic litter is itself a hybrid object, emblematic or even iconic for indissoluble nature-culture amalgamations as well as for vast yet unknown networks of effects. Hence, I am arguing that it is important to study collaborative efforts between citizens and scientists, between vernacular and scientific knowledge practices, because of the potential capacity of such new alliances concerning environmental problems.

By exploring and mapping multiple ethnographic case studies in Europe, North and South America and Oceania, my research aims to identify new actors, collectives, alliances, collaborations, conflicts, and environments of knowledge production, activism, and politics in the field of ocean plastics. The ocean as a huge body of water entangled with anthropogenic materials like plastic can help to reflect the (inter)dependencies of individual bodies and societies with plastics, challenging simplistic notions of solution and purification of the natural from the social/cultural.

## *Wastelands: An Oceanography of Trash*

Petra Beck

Humboldt Universität zu Berlin

Oceans contain higher and higher concentrations of plastics and debris. With over 270 000 tons of plastics in the oceans a message in the bottle will be hard to find. Marine pollution is growing. In 2050 there will be more plastic in the oceans than fish, a study stated recently. Plastic is floating, the debris is forming gigantic assemblages; nightmares of consumption. Here it is: the “away” of throwing something “away”. The “away” that doesn’t exist. Being a “Place of no return”, an “awayplace”, a space, that can contain polluted things is an idea, that is connected to the socio-technical imaginary “ocean” since the ancient world. 3 Million tons of plastic “disappear” into the oceans every year, without evidence of their whereabouts. Here the material, origin of calculated chemicalphysical-synthesis processes and rational design choices, becomes an amorphous, mystic matter, without a grasp. Plastic becomes the ocean and part of its myths. To counsel these assemblages and hear their “excruciating complexity” and to see them as “an open-ended collective” is the aim of this ethnographical research.

The project examines the oceans as a specific thingspace that relates people and things on a global, biochemical, ecological, political and social level. The research focuses also on the complex materiality of plastics itself. How to work with plastics’ complexity? What new conceptualizations of human-environment interfaces and relations emerge? How is plastic challenging the entities “nature” and “culture”? How do materialities and knowledge circulate through various scales – from nature-culture interfaces on a molecular level to global environmental politics and infrastructures? The open questions concerning the quantification of microplastics, its complex interactions, behavior and effects are still as ubiquitous as the material itself. Over 10,000 types of plastic polymers, countless additives, complex interactions, a per annum production of 260 million tons, an almost infinite scope in usage, all this raises “the issue of the ontological status of plastics” (Gabrys, Hawkins, Michael, 2013: 4). And also methodological questions: How to develop an interdisciplinary language to work with “plastics”? How to deal with complex scaling processes? How to empirically work with global phenomena?

# *Materials that Linger: A Geographical Biography of Polyester Fabrics*

Elyse Stanes

Chris Gibson

University of Wollongong

**N**arratives of clothing reuse and repurpose have centred on second-hand economies, recycling, upcycling and DIY, fashioning a ‘wasted’ aesthetic of stitching, darning and patching. But what of clothes that don’t show signs of wear, because they are made from synthetic fabrics that degrade much more slowly than organic materials? In this paper we follow the prosaic biography of polyester clothes, geographically, in and out of spaces of production, use, storage, divestment, reuse and recirculation. Clothing is theorised as always-in-process, materially, temporally and spatially, and

understood haptically. Reconfiguring concepts of fashion waste questions how clothes become redundant – their material memories instead lingering in stockpiles of divested objects, hand me downs, cycles of second-hand trade and ultimately, landfill. Polyester, we argue, manifests a particular variant of material culture: both mundane and malignant, its haptic properties and slow decay result in clothing that seldom slips from the category of surplus to excess in clear ways.

## *Weaving Solutions to Microfibre Pollution: The Social Practices of Apparel Production, Consumption, Wearing, and Washing*

Lisa Heinze

University of Sydney

**S**ynthetic fibers constitute over 50 per cent of all fabric produced (Fletcher 2014), which has resulted in the unforeseen consequence of plastic microfibers appearing in waterways, on coastlines, and inside fish and fish-eating birds as they escape through standard washing machine filters (Duis and Coors 2016; Hartline et al. 2016; Browne et al. 2011). There remains a gap in the literature (and practice) as to how to effectively engage consumers towards solutions for this problem. While some organisations are investigating fabric innovations (Fletcher and Tham 2014; Gordon and Hill 2015; Hethorn and Ulasewicz 2015), suggested solutions largely rely on consumer behaviour change, a largely ineffective mode of altering apparel practices, through the use of special laundering bags or after-market filters. In this paper I build upon Shove’s work on laundry as a co-production of those doing laundry, their values, tools and time commitments (Shove 2003), to examine

the co-evolution of microfiber pollution and apparel production, buying and laundering. Specifically I will consider the practices of two (synthetic-loving) apparel brands – Patagonia and H&M – and integrate findings from empirical research with consumers about their buying and use of clothing to demonstrate the need for a holistic solution. I argue there is an urgent need to move past ecological modernisation innovations that are heavily reliant upon consumer behaviour change towards direct engagement with the consumer-citizen and her lived experience of clothing. In conclusion, this paper examines the social practices of apparel to shed light on the emerging problem – and potential solutions – of microfiber pollution by considering the experience of consumers and their apparel buying, wearing and washing practices.

## *Material Design: Science, Culture, Society*

Faith Kane

Massey University

There is a growing awareness of the devastating ecological, social, cultural and even political effects of certain materials, such as plastic. At the same time, the diversity of materials available to us and the means by which we can manipulate them for design purposes is expanding rapidly. Recent decades have seen an increase in designers themselves engaging in the ideation and development of new material concepts and systems; often motivated by the need to address the problems associated with this area as well as the perceived agency of materials themselves to affect positive change. The approach taken by designers is often distinct to that of materials scientists and engineers. Whilst engineers seek to apply scientific analysis to quantify and define material properties towards solving utilitarian problems, designers are perhaps more concerned with the complex way that materials effect our experiences of the physical world, considering aesthetics and meaning alongside functionality. In order for a new material to ‘succeed’, an understanding of its implications as part of something that is used within a lived context is needed. This

requires understanding from both approaches and beyond. Including broader cultural and sociological perspectives from craft, art, anthropology and archeology (Drazin and Kuchler 2015: xxi). As such, an expanded field of ‘materials design’ is emerging.

The proposed presentation is based on the initial stages of research that seeks to develop an interdisciplinary model for materials design towards sustainability within the New-Zealand context. The project has a ‘place-based’ emphasis, focusing on local resources. Insights from preliminary inquiry into current approaches to materials design will be presented, drawing on the authors recent work in textiles (laser and enzyme processing for textiles) and composites (Flax/PLA). And, proposed case study work in the area of natural fibres and bio-plastics will be outlined.

Drazin, A. and Kuchler, S. (2015), *The Social Life of Materials*, London: Bloomsbury.



*Dr Faith Kane's core knowledge and experience is in textile design, research and practice. Specifically woven textiles, laser processing textiles and textile design for sustainability. Her research focuses in particular on the design and development of more sustainable textile processes and materials through interdisciplinary collaborations, with an interest in the role and value of craft knowledge within this area. Faith is the major co-ordinator for textile design at CoCA, teaching into a range of courses across textiles.*

## *Space Between: Circular Fashion Systems*

**Jennifer Whitty**  
Massey University

**F**ashion is dominated by a linear operating system at both a macro and a micro level. The industrial system has set the tone for all fashion activities. The compartmentalised ‘take, make, waste’ approach has, in turn trickled down to influence consumer culture who similarly consume and then discard clothing at their earliest convenience. The impact of this system is so undeniably negative on our environment and people that fashion is one of the most polluting industry on our planet, after oil. Waste is inherent in this system, as one third of all clothing produced for retail is never sold and is often incinerated. (Ecotextile 2016). The lifespan of garments is decreasing as globally 80 billion pieces are thrown out every single year, which is 400% more than 20 years ago (Morgan, 2015). The majority of this clothing (80%) is made of polyester, a plastic derived from crude oil can take approx 200 years to break down. In an attempt to address and interrogate these issues the practice based research project Space

Between was established by the researcher Jennifer Whitty and Holly McQuillan in 2015. Its aim is to explore and disrupt the space between the components of the linear system inherent within the current industry, consumer culture, and education with the aim of creating a less wasteful, expansive, inclusive circular mode of operation. Can we encourage behavioural change by reframing the unwanted detritus from the current system as resource to ultimately aid the transition to a circular economy?



*Jennifer Whitty is an award-winning designer and researcher working in fashion design. She has worked across approaches ranging from garment design/creation (bespoke/couture to mass production) to alternative design strategies, film, performance, installations, workshops, and, more recently, digital interaction.*

*Whitty focuses on creating new, more flexible and sustainable ways of thinking, creating and responding to clothing that attempts to address the damaging effects of the fashion industry, such as the shortened life span of products, environmental waste, and the loss of traditions. Having worked in the industry in the fashion centres of New York, London and Paris, Whitty has a particular interest in new models of practice that will redefine the future of fashion. .*



# *Addressing the Issue of Bio-Material Contamination in Commercial Composting*

**Jonathon Hannon**  
Massey University

This paper reports on a research field-trial, which sought to address the end of life issues associated with a range of 'green / eco' bio-materials sold locally. This class materials and products, which includes bio-plastics, are variously marketed and sold as: 'biodegradable', 'bio-based', 'recyclable', 'renewable' and or 'compostable', yet were not being accepted for organic recycling into the Palmerston North City Council (PNCC) commercial composting operation. Therefore, both the implied environmental benefits of these materials and the eco-conscious aspiration of target consumers were essentially void, as locally all of this class of materials end up in landfill. The media associated with this issue and project indicates that, in this respect Palmerston North is likely to be typical of other New Zealand cities.

The practical objective of this research collaboration, was to co-develop 'standard operating

procedures' (SOPs) for: 1- the acceptance and 2- the processing of bio-materials in the PNCC composting operation. The intention is that, the 'Acceptance SOP' will be communicated outwards to the organic waste supply network to reduce contamination, whereas the 'Processing SOP' will enable successful inclusion and composting of bio-materials in conformance with the PNCC's 'Compost Operations Management Plan' (COMP). The overarching principal driving this project was to enhance the compost operation's commercial viability (by enabling an increase in collection volumes of the PNCC's commercial organic waste collection service), whilst progressing the goals of the PNCC's 'Waste Management, Minimisation Plan' (WMMP), which is to facilitate achievement of the community target of 75% diversion of waste to beneficial use (currently at 59%).



*Jonathon Hannon is the coordinator of the Zero Waste Academy, based at Massey University in New Zealand. This role involves teaching, research supervision, industry / community consultation and advisory on campus and city sustainability. Jonathon has extensive knowledge, experience and passion for the Kiwi recycling industry, as a crucial environmental service provider to the New Zealand economy. He is currently undertaking a PhD exploring and evaluating municipal zero waste methodologies.*

*Evaluating Sustainable Practices at Christchurch City Council  
Events: Analysis of Waste Diversion and Event Attendees Perceptions  
of Compostable Service Ware Initiatives*

Emma McCone

University of Canterbury

Sustainable event management is becoming increasingly important as expert event planners, key stakeholders, and the general public become more aware of the social, environmental, and economic effects of their actions. Over the duration of a large scale public event, the resources consumed generate large volumes of waste, generally sent to landfill with very low diversion rates. The trial initiative that this study will evaluate is part of a wider council focus on sustainability in an effort to influence sustainable urban policy. The level of success of the trial and provide key insights and recommendations for future sustainable event planners and stakeholders. The data is based on a combination of key waste indicators from the waste processing facilities, and public and stakeholder perceptions obtained from a survey. The study provides useful insight for future event planners who share a similar interest of increasing sustainability within their events. The trial marks the beginning of a process, attempting to develop Christchurch city's reputation as a sustainable city. Christchurch also has a unique opportunity through these trial events to market itself, and develop more sustainable practice in broader urban policy.

This trial initiative is implemented across three large scale Christchurch City Council public events in February 2017. The trial initiative endeavours to reduce the environmental impact of service ware and improve overall event landfill diversion rates. This is done by streamlining service ware at the events to a range of sustainable and compostable packaging only. The study aims to measure

# *Plastic Debris: Recycling Options for Closing the Loop*

Isabel Cañete Vela

Henrikke Baumann

Chalmers University of Technology

Plastic debris (marine litter) is one of the biggest pollution problems in the marine environment. Nets, ropes, packaging, and pellets are the most common items that are spread around the world's oceans causing an impact on wildlife and human health, and economic loss. Although mitigation is tantamount, the question remains for what can be done with the plastics that are already in the oceans. Studies as shown that much of the collected marine debris goes to landfilling because it is little-known, diverse, salty, and too dirty for both incineration and recycling. We conducted a literature review of research on debris and plastics waste management. It showed that there is a strong focus on describing the environmental problems of marine and plastic debris, and that plastic debris is described in natural science terms that the waste management industry cannot use for determining suitable treatments. In order to better translate beach debris data into waste management data, we have collected beach debris from the Swedish West coast and conducted physical and chemical analyses in order to characterise the debris in waste management terms. Based on this data and the literature review, we have identified several recycling options for the plastic debris. In order to identify environmental pros and cons with the different treatment, we will conduct a life cycle assessment (LCA) comparing mechanical treatment, incineration, gasification, pyrolysis, and others processes to establish an appropriate and practical approach towards closing the loop for plastic debris.

Preliminary analyses suggest that mechanical treatments are not suitable for most the plastics (due to they are fragmented, degraded and with a wide range of additives) whereas chemical treatments are suggested as a suitable solution. Feedstock recycling allows the production of raw material, as well as it may have fewer emissions in contrast with combustion which has operational problems and the gas cleaning might be insufficient since litter has pollutants such as chloride. The research is in progress and will be complete for the conference.



*“I LOVE WASTE. I love it because waste management is a big CHALLENGE and I believe that handling this discharged material properly is necessary for a sustainable development. Working in the recycling industry, realised how complex waste handling is, especially if it is to be efficient, and how difficult it is waste management. Knowing this, I decided to do research about one of the biggest pollution problems in the marine environment: Plastic debris. Willing to close the loop of this lost flow.”*  
*Isabel Cañete Vela*



*Henrikke Baumann is Associate Professor at Environmental Systems Analysis, Chalmers University of Technology in Sweden. She has an interest in flows and all things ‘life cycle’, as these cross boundaries and escape disciplinary categorization. Product flows cross both sector and national boundaries, enabled by people far and apart without them knowing much about each other’s worlds. She has authored the international best-selling textbook ‘Hitch Hiker’s Guide to LCA’ and is also an adept videographer. Her latest research video is ‘Reversing the flows’ about a clean-up of marine debris on beaches up in the Arctic.*

## *Pollutants, Polymers and Pigments: The Material Contingencies of PET Bottles*

Tatianna M. P. Silva  
University of Edinburgh

This presentation is based on a case study of the afterlife of PET (polyethylene terephthalate) bottles and its implications for the socioeconomic empowerment of waste pickers in Brazil. It is structured around the journey of discarded PET bottles between the loss and regeneration of value (Reno, 2009). Bottles were followed as they changed hands and cruised space from the moment they were first reclaimed by waste pickers in the biggest dumpsite of Latin America until their physical and chemical transformation into a new product. Counteracting the common view of waste as “an end of the line product, a left over, with no use, which is discarded and preferably made invisible” (Gutberlet, 2008), this study places waste under the spotlight using it as a tool to unveil the mechanisms that hinder waste picker’s socioeconomic empowerment. It draws on visual and ethnographic data collected during six months of fieldwork between July/2016 and February/2017 to discuss how the recycling chain of PET bottles is socially, spatially and materially organised in Brazil and how this configuration disadvantage waste pickers. The study

departs from the extant literature on waste pickers’ marginalization in Brazil, which has concentrated on local level interactions among waste pickers and between them and local authorities as scale of analysis. However, it draws on sociological and geographical research to advance an analytical adjustment and propose a relational triadic framework informed by the social embeddedness, spatial situatedness and material contingencies of recycling chains in Brazil to better understand the phenomenon of waste pickers’ exclusion.



*Tatianna Silva is a PhD candidate in International Development at the University of Edinburgh and holder of a Perfect-Storm scholarship awarded by the Leverhulme Trust. She has a background in Law and Public Policy and holds degrees from the University of Oxford and the Universidade Federal de Minas Gerais, Brazil. She works as a volunteer translator for the Global Alliance of Waste Pickers. In 2014, she won the Green Talents award for young researchers in the field of sustainable development hosted by the German Ministry of Education and Research. She researches recycling economies in Brazil currently focusing on PET bottles.*

## *Currents of Plastic Awareness: An Anthropological Study of NGO Efforts to Create Knowledge and Awareness of Plastic Pollution in the Ocean*

**Johanne Tarpgaard**  
Aarhus University

Plastic pollution makes us ask questions of nature and culture dichotomies, of landscapes and oceanscape, and to what extreme extent human behavior has affected this planet. Based on an anthropological fieldwork with the international NGO Plastic Change, based in Denmark, my project asks how plastic pollution is made and spread as a meaningful and significant environmental issue in the Danish society. Drawing on fieldwork from travels with their expedition ship in the Pacific Ocean, as well as meetings, conferences and interviews with the employees, I examine how Plastic Change produces and communicates knowledge about plastic pollution to the Danish population. Focusing on the social processes of building public discourses about environmental problems, I argue that environmental knowledge and awareness spreads in a way analogous to how plastics are spread by ocean currents. Just as the amount of plastic pollution in the ocean is not the same in every part of the ocean but accumulates in specific zones, so too is the awareness of plastic pollution not the same everywhere.

Thinking with watery metaphors allows us to analyze the development and spread of environmental awareness in new ways. As the Anthropocene calls for new perspectives on human relations to our surrounding environment, my analysis offers new theoretical perspectives for understanding environmental problems and explores some of the tools, concepts, and ideas we need to better understand new environmental movements.



*Johanne Tarpgaard has just recently finished her master degree in anthropology from Aarhus University. Throughout her master degree she has been affiliated with Aarhus Research in the Anthropocene (AURA). Based on anthropological interest and profound work experience with human relation to the ocean she started her fieldwork on the expedition ship of an environmental organization working with plastic pollution. Her insight offers new theoretical perspectives for understanding environmental problems and explores some of the tools, concepts, and ideas we need to better understand new environmental movements.*

***Making Sense of Plastic Pollution: A UK Study of Images,  
Messages and Perceptions of (Micro)Plastics***

**Lesley Henderson**

**Christopher Green**

Brunel University London

**T**his paper reflects on an interdisciplinary study into UK public perceptions, attitudes, and behaviours concerning plastic pollution. This is a unique collaboration involving social scientists, eco-toxicologists, and BBC natural history film makers. We explore how ideas about microplastics are mediated by culturally embedded notions of what is risky or harmful and explore the wider role of media in mediating messages and creating “frames of understanding” about the associated environmental and health risks of (micro) plastics. The wider study involves systematic media content analysis (1 year during 2014-15), online deliberative survey tools, and focus groups with people who might be expected to have specific perspectives on the topic (paddle boarders, environmental activists) and others with no obvious interest in the issue (e.g. young mother and toddler community group). It provides insights into how we can involve the public in culturally appropriate education strategies to change our behaviour regarding plastic waste and the ways in which public perceptions of risk and health intersect with and potentially also undermine wider messages regarding possible solutions to the problem.

*Plastic Pollution in Marine Environments: Trans-disciplinary  
Approaches Promoting Public Stewardship of Aquatic  
Environments*

**Luisa Galgani**

University of Siena

**Steven A. Loiselle**

EarthWatch Institute

**A**cross the globe, the increasing quantity of plastics in our lakes, rivers and seas has impacts on aquatic food webs, carbon dynamics and ecosystem services. Microplastics are an invisible part of the problem, but with significant effects on the biogeochemical cycling of fundamental elements. Floating low-density microplastics may be found in the sea-surface microlayer, a key interface for biochemical and photochemical processes controlling the exchange of gases between the ocean and the atmosphere. In the present study, we explore the photochemical and biological cycling of organic aggregates in relation to their interaction with microplastic pollutants in the first millimeters of the water column.

**I**mportantly, while the scientific community (including ourselves) is dedicating much effort on the impacts of plastic on marine and in general, aquatic ecosystems, the problem of plastic pollution needs to be tackled on land. Therefore, we present a citizen-science project aimed at promoting public stewardship of local aquatic resources, quantifying the type and quantity of plastic entering our rivers with the aim of reducing the amount of plastic reaching our seas. Efforts to solve the plastic problem require a partnered approach between research institutions, municipalities, educational institutions and citizens that can be achieved through citizen science.

**F**ocusing on the connectivity of all aquatic ecosystems in the emerging challenge of plastic debris in the hydrosphere, we present recent research activity as well as the efforts of the community of citizen scientists monitoring local water bodies for anthropogenic litter presence and composition.



## *The Evidence to Change the Culture – Issues Around Marine Litter*

Marie Russell

Colin Moffat

Marine Scotland Science

**M**arine litter pollution is a preventable problem. With a substantial proportion of marine litter being plastic litter it's long life and propensity to mechanically degrade into smaller particles are both significant issues. To change culture requires not just hard scientific facts, but consideration of how these are presented as well as providing alternatives since we all benefit from plastics e.g. for food preservation and medical disposables. During litter surveys by Marine Scotland Science it is clearly shown that inshore waters such as the Clyde and Forth estuaries are more polluted by litter than offshore areas such as the seas around Rockall. The majority of the inshore pollution is consumer items such as plastic bottles, metal cans, plastic items and food containers. An example before the introduction of the plastic bag levy in 2014 around 770 million single use bags were given out in Scotland. At the end of the first year there was an 80% reduction in the use of these single use plastic bags. Thus a small incentive had a beneficial effect. The evidence for litter pollution and its effects around Scotland will be discussed as will the implementation of Scotland's Marine Litter Strategy which aims to reduce the levels of litter entering the sea while bringing together measures for education and awareness raising; supporting economic growth; monitoring the scale of the problem; and influencing actions more widely at the UK, EU and international scale.

**A**s we deliver the information on the nature of the problem and its impact, there is a greater chance of people listening and considering change. Any strategy to reduce marine litter must assist individuals and communities to change their habits with respect to use, discarding and recycling of plastics; where possible the use of alternative materials must be encouraged. For

## *Plastic Inheritance*

Heather Davis

Pennsylvania State University

Plastic is a material of contradiction, at once enabling and deadly. At this point in time, however, we cannot extract ourselves from plastic as it generates and produces the world and the people that we are. I am interested in the questions of inheritance as they relate to plastic, how we often inherit uncomfortable legacies, and sometimes deadly ones. In this talk, I will focus on two different kinds of inheritance. The first describes the beginning of the plastic industry, with an anecdote from my family history. My maternal grandfather worked as a manager and chemical engineer at Dupont developing synthetic fibres for most of his career. This legacy has particular material consequences, but it also became a mechanism for the transfer of privilege through wealth and education. The second story is that of my colleague, Courtney Morris, whose grandmother was forced to relocate from Mossville because of the expansion of and pollution caused by nearby PVC plants. Mossville was a freeman's town, that is, a town where free African-American former slaves went for sanctuary and to rebuild their lives. These two stories of inheritance illustrate the complicated legacies of environmental racism, privilege and the enabling and constraining conditions of the production of plastics. Drawing on feminist science studies scholars such as Mel Chen, Michelle Murphy and Donna Haraway, I ask how we might begin to come to terms with these legacies and work toward more just futures?

## *Toxicity and Technofossils: An Interdisciplinary Dialogue*

Sy Taffel

Trisia Farrelly

Massey University

**M**ore plastic was produced in the past decade than during the entire 20th century. We currently produce over 300 million tonnes of plastic each year. This accumulating layer of non-biodegradable matter has been recognized as one of the markers of the Anthropocene, a time where human-led actions will have serious impacts on the Earth System that are felt over geological durations. We have built a world in which we are reliant on a multiplicity of plastics for our everyday communications, technologies, transportation, packaging, and health. However, the global explosion of plastic has produced a range of undesirable effects. For example, a growing body of research illustrates how endocrine disrupting chemicals and micro-plastics are impacting diverse ecosystems in often unpredictable ways. Additionally, many harms associated with the production and accumulation of plastic are experienced in places far removed from the major sites of consumption, as seen in the global movements of electronic waste. This raises complex questions surrounding how to mobilise effective political responses to the harms caused by the current, global plastic economy.

**T**he complexities inherent in the lives and afterlives of plastic require an interdisciplinary focus that crosses the traditional divisions between the natural and life sciences, the social sciences, arts, and humanities. This interdisciplinary discussion between an anthropologist and media researcher will explore the political ecology of plastics. Particular attention will be paid to toxicity, materiality, the Anthropocene and the limits of consumer responses and responsibilities to this multi-faceted and multi-scalar crisis of capitalist over-production. How do we move beyond the current crisis and work toward more just futures?



*Sy is a co-director of the Massey University Political Ecology Research Centre and is one of the centre's founding members. His research interests include political ecologies of digital media, digital media and political activism, the material impacts of media hardware, pervasive/locative media, software studies, social media and peer-to-peer production. Sy has published widely around the environmental impacts of digital technologies and along with Nicholas Holm, Sy co-edited the anthology *Ecological Entanglements in the Anthropocene*. He has also published in journals including *Cultural Politics*, *Culture Machine*, and *The European Journal of Media Studies*. Sy also makes documentary/activist films, including for environmental groups such as the Environment Network Manawatu and *Carrying Our Future*.*



*Trisia is a Co-Director of PERC. She is also a co-founder of the New Zealand Product Stewardship Council (NZPSC) and the environmental lobby group, *Carrying Our Future*. Trisia is the Massey University representative for the Association of Social Anthropologists Aotearoa New Zealand and a member of the Sites Editorial Board. Her current research interests include the political ecologies of plastic production, consumption, and disposal; policy and marine microplastics research; the cultural construction of benign/ hazardous plastics; social license to operate (marine industries); and protected area management.*

## *Making Plastics Bio- Bioplastics' Making*

Damla Tonuk

This paper explores the emergence of and change in bioplastics, by taking account of processes of making plastics “bio” in generic categories and bioplastics’ making into market goods in specific production relationships and arrangements. Bioplastics are one of the outcomes of an interesting twist of valuation of plastics. In the beginnings of 1900s, first commercially successful plastics, such as Bakelite, became marvel materials, precisely for the fact that they, unlike natural materials, resisted decay and deformation, and did not ‘take from’ mother earth. A century later, as a result of changing conceptions of consumption, nature and sustainability, plastics are devalued because they are resistant/durable and do not take from mother earth. These processes of changing valuations and qualifications of plastics, involve different motives and interests. However, attempts to create a new generic category and to qualify it as bio tell only part of the story of bioplastics.

I extend my account by exploring the specific arrangements implicated in the actual making of bioplastics in industrial production and manufacturing processes. This part of the story shows the ways in which the generic category and its qualities are elaborated further in specific production processes. My story of bioplastics tells something about all materials in general: Plastics and materials change and react according to what is valued and changing interests and motives of the actors and arrangements involved, as well as reproducing these. As such materials, in general, figure as a constant remaking.

*Damla Tonuk studied Industrial Design at Middle East Technical University (METU), Turkey. She pursued her interest into the make-up of things with her PhD in Sociology at Lancaster University, UK. Currently she is based in Turkey continuing her professional and academic interests.*

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