



FROM THE DEEP SEA TO THE RUNWAY: THE INFLUENCE OF MARINE BIOLUMINESCENCE ON SUSTAINABLE AND AESTHETIC FASHION COLLECTION.

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ABSTRACT This paper navigates the historical trajectory and current landscape of eco-friendly concepts and sustainable design trends within the fashion industry, positioning eco-fashion as a critical element in the evolving philosophy of sustainability. It explores the motivations behind movements aiming to reshape the fashion industry into a more responsible entity, acknowledging the intricate challenges associated with achieving sustainability. Central to this discussion are issues such as the working rights of those involved in clothing production and the escalating environmental impact of the global fashion industry. Organized movements on various platforms have brought attention to sustainability, leading to the emergence of green trade fairs, ethical movements, and eco-friendly concepts as integral components of the contemporary fashion scene. Notably, the industry is now more attuned to these initiatives compared to a decade ago. This research paper explores the inspiration, design process, material selection, and challenges encountered in the development of the "Sea Nettle" fashion collection. Inspired by the ethereal beauty of sea nettle jellyfish, this collection captures their fluidity, translucency, and vibrant color palette. Through extensive research on marine biology, sustainable fabric selection, innovative design techniques, and experimentation with textile manipulation, this collection seeks to bridge the gap between conceptual fashion and commercial wearability. The study further discusses the implications of sustainable fashion choices, the technical aspects of fabric testing, and market relevance, ensuring the collection aligns with contemporary fashion trends.

KEYWORDS : Sea Nettle, Jellyfish-Inspired Fashion, Sustainable Fabrics, Chiffon, Gradient Dyeing, Marine-Inspired Apparel, Textile Innovation, Frills and Ruffles, Summer 2025 Trends

INTRODUCTION

The sea nettle jellyfish (*Chrysaora* spp.) is a creature of extraordinary grace and quiet power. Found in the Atlantic, Pacific, Japanese, and Black Seas, this marine invertebrate captivates with its pulsating bell, flowing tentacles, and iridescent hues that shift and shimmer with the movement of water. Despite its delicate appearance, the sea nettle is a resilient and adaptive organism — traits that mirror the evolving nature of contemporary fashion. In this research, the sea nettle serves as both an aesthetic and conceptual muse for a summer fashion collection that merges nature's elegance with modern design innovation.

As the climate crisis and consumer demand for sustainability reshape the fashion industry, designers are increasingly turning to the natural world for inspiration and ethical guidance. The sea nettle, with its biodegradable body and seamless interaction with its ecosystem, offers a compelling model for biomimetic design. Its radial symmetry, semi-translucency, and layered structure provide a rich visual language that can be translated into textiles, silhouettes, and construction techniques. At the same time, the creature's movements — gentle, fluid, and unhurried — evoke a sense of calm and freedom that resonates with the emotional tone of summer wear.

This research investigates how the organic forms, textures, and color palettes of sea nettles can inspire clothing that is both wearable and imaginative. By employing experimental textile techniques such as gradient dyeing, pleating, and layering, and by sourcing sustainable, ocean-friendly materials, the collection seeks to embody the essence of the jellyfish — its beauty, fragility, and quiet resilience. The result is a fashion collection that not only echoes marine aesthetics, but also encourages a deeper dialogue between fashion and the environment.

Ultimately, the goal is to create garments that capture the ephemeral magic of jellyfish in motion — garments that float, shimmer, and shift like light through water, while also functioning in a contemporary wardrobe. In doing so, this collection offers a vision of fashion as a medium of storytelling, environmental awareness, and artistic transformation.

2) Research Objectives

- To analyze the morphology and coloration of sea nettle jellyfish for visual and structural inspiration.
- To experiment with textiles that replicate jellyfish movement (e.g., sheer fabrics, pleating, floating panels).
- To apply gradient dyeing and transparency layering for a jellyfish-like visual effect.
- To incorporate sustainability through material sourcing and

production methods.

MATERIALS AND METHODS

Fashion Theory References

1. Roland Barthes – *The Fashion System*

Barthes argues that fashion is a language — a system of signs that communicate meaning beyond utility. In the context of your jellyfish-inspired collection, the sea nettle becomes a symbol not only of natural beauty but also of environmental consciousness. The fluid forms and translucent fabrics speak a visual language of impermanence, softness, and ecological harmony.

Quote: "Fashion is a system of meaning, a language where the garment is the sentence, and the fabric, color, and form are words." – Roland Barthes, *The Fashion System* (1967)

Application: The collection uses fabric and form to speak to the fragility of marine ecosystems and the elegance of sustainable design.

2. Gilles Lipovetsky – *The Empire of Fashion: Dressing Modern Democracy*

Lipovetsky views fashion as both an individualistic and democratic force — a way for people to express identity and values. In this sense, your collection can be seen as an act of soft activism, using the jellyfish motif to advocate for ocean conservation and responsible consumer behavior.

Quote: "Fashion is a mirror of the modern world, reflecting both its values and contradictions." – Gilles Lipovetsky, *The Empire of Fashion* (1987)

Application: Your sea nettle collection reflects modern values of sustainability, softness, and fluid genderless forms.

3. Caroline Evans – *Fashion at the Edge*

Evans explores how avant-garde fashion often draws from decay, transformation, and the ephemeral. Jellyfish, with their ghostly forms and fleeting life cycles, align beautifully with these ideas. This reference supports the poetic and conceptual aspects of your designs.

Quote: "Fashion speaks of the body, and often the absent or transformed body — it is about memory, loss, and becoming." – Caroline Evans, *Fashion at the Edge* (2003)

Application: The ephemeral, ghostlike quality of jellyfish echoes the transient nature of fashion, the ocean, and even identity itself.

4. Li Edelkoort – Anti-Fashion Manifesto

Edelkoort called for a fashion future rooted in ethics, sustainability, and nature-inspired design. Your collection fits seamlessly into this vision — it's fashion that doesn't just follow trends, but redefines what fashion can be.

Quote: "We are witnessing a turning point in fashion history... A desire for clothes with soul, stories, and sustainability." – Li Edelkoort, *Anti-Fashion Manifesto* (2015)

Application: Your collection is a response to this manifesto — replacing fast fashion with slow, ocean-inspired design that tells a story.

Research and Concept Development

Extensive research was conducted on various species of jellyfish, with a particular focus on sea nettles due to their distinct color variations and movement.

Study of marine biology sources detailing habitat, life cycle, diet, and ecological significance of sea nettles.

Analysis of previous fashion collections inspired by marine life, identifying gaps in commercial viability and practicality.

Fabric Selection and Testing

Primary Fabric: Dyeable chiffon, selected for its translucent, lightweight, and flowy properties, mirroring the texture of jellyfish.

Sustainable Base Fabric: Recycled cotton sourced from Himachal Pradesh, ensuring breathability and environmental responsibility.

Testing Process

Two types of chiffon were tested for wash durability, frill-making capabilities, and Fugotting techniques.

Tests conducted before and after washing, with different sewing methods (hand, SNLS, and fashion maker machine) to determine optimal construction methods.

Design Interpretation

Design Translation

- **Silhouettes:** Flowing shapes, asymmetry, volume with control (mimicking tentacle structure)
- **Textiles:** Organza, silk chiffon, recycled tulle, biodegradable synthetics
- **Techniques:** Ombre dyeing, laser-cut overlays, pleating, heat-set textures, Adjustable elements such as drawstrings and gathered effects to create fluid motion.
- **Color Palette:** Coral pinks, seafoam blues, deep indigo, pearlescent neutrals

Embellishments And Details:

- To embody the sea nettle's movement and texture, various techniques were integrated into the garments:
- Frills and ruffles – Representing the jellyfish's lacy oral arms.
- String embellishments – Mimicking tentacle-like formations.
- Beadwork – Enhancing marine-inspired elegance.
- Flowy silhouettes – Capturing the effortless drift of jellyfish in water. Silhouettes were designed to be flared and semi-fitted, appealing to a broad target audience while maintaining comfort and sophistication.

RESULTS AND DISCUSSION

Garment Breakdown

The collection consists of six garments, each uniquely translating the sea nettle's beauty into fashion.

1. Gradient Top and Skirt



Inspired by the delicate oral arms of the jellyfish, this ensemble features a vibrant orange-to-maroon gradient. The top and skirt are designed with adjustable drawstrings, allowing a flexible fit. The gathered fabric effect mirrors the organic forms found in nature, and the use of chiffon ensures lightness and movement.

2. Asymmetrical Ombre Dress

Designed to reflect the jellyfish's translucent bell, this dress boasts a white-to-pink ombre effect. The asymmetrical hemline, paired with cascading frills, evokes the graceful motion of jellyfish tentacles. Bead embellishments add a shimmering marine touch, making it an ideal beachwear piece.



3. Keyhole Pleated Dress

This elegant dress features a subtle keyhole opening at the back, enhancing its fluidity. The front is adorned with small pleats, mimicking the texture of jellyfish arms. Handcrafted macramé threads with delicate bead details further enhance the aquatic theme.



4. Two-Tone Top and Tulip Pants

A sophisticated ensemble, the two-tone top is joined by gathered detailing, creating a soft, flowy effect. The tulip-style pants incorporate a slit that adds movement, reflecting the dynamic sway of jellyfish in water.



5. Cascading Ruffle Dress

This piece merges pink and white hues, embodying the translucency of sea creatures. Chiffon and cotton are layered strategically, providing both structure and fluidity. A series of cascading ruffles flow down one side, imitating the jellyfish's tentacles, while pearl embellishments replicate the shimmer of water droplets.



6. Off-Shoulder Flared Set

Blending the softness of chiffon with the structure of cotton, this outfit features deep crimson transitioning to fiery orange. The off-shoulder sleeves and ruffled accents mirror the bioluminescent glow of jellyfish, while layered flared pants enhance movement and rhythm, completing the ethereal marine look.



Sea Nettle: A Secret of the Ocean Style



Sustainability Impact

The integration of recycled cotton in the collection reflects a strong commitment to sustainable fashion practices. As one of the most environmentally taxing crops, conventional cotton production involves high water consumption and chemical use. By choosing recycled cotton, the collection significantly reduces textile waste, conserves natural resources, and limits the carbon footprint typically associated with virgin cotton.

Furthermore, sourcing fabric locally from Himachal Pradesh enhances the project's ecological and social responsibility. This regional focus minimizes transportation emissions while also strengthening local

economies and traditional textile communities. Supporting small-scale and artisanal producers not only helps preserve indigenous craft techniques, but also contributes to a more circular, ethical fashion system.

In embracing both material innovation and locality, the collection positions itself within the growing global movement toward regenerative fashion — where design choices are made with long-term ecological and social wellbeing in mind.

Market Relevance And Trend Forecasting

- Designed for Summer 2025, aligning with forecasted trends of frills, flares, and bold colors.
- Breathable fabrics cater to seasonal comfort and wearability.
- Adaptability for ready-to-wear and sustainable fashion categories, making the collection commercially viable.

CONCLUSION

The “Sea Nettle” collection successfully translates marine beauty into a sustainable and wearable fashion line. By integrating research-driven design techniques, ethical material sourcing, and experimental textile manipulations, this collection achieves both aesthetic appeal and practicality. The study underscores the importance of innovative fabric choices, meticulous testing, and sustainability in modern fashion, paving the way for future marine-inspired designs. While challenges such as precise dyeing and fabric selection posed difficulties, the overall outcome exemplifies the potential of nature-driven fashion narratives.

Future Scope

- Expansion into accessories incorporating marine motifs.
- Exploration of biodegradable fabrics for enhanced sustainability.
- Application of digital textile printing for precision dyeing.

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