Chapter 1

Color Palette Reference

This appendix documents two complementary color systems designed to be **distinct** from each other:

- **Washi-Ink** — 19 colors, warm-dominant + cool extensions, traditional Japanese aesthetic
- **Oceanic** — 21 colors, cool-dominant (H: 180–240°), scientific/technical aesthetic

All 17 chromatic Washi colors have $\Delta E \geq 18$ to any Oceanic color, ensuring the palettes can be used together without confusion.

1.1 Washi-Ink (19 Colors)

Design Philosophy

> *"Warm earth tones on handmade paper"*

Character: Earthy, organic, traditional Japanese. Warm-dominant hues (H: 0–70°) with signature browns that Oceanic lacks. Saturation 27–85% for rich, warm tones.

1. Reds — (Aka)

- `washiAka` (#B03030, H:0° S:57%): True red
- `washiBeni` (#C04050, H:352° S:50%): Crimson-pink

2. Oranges — (Daidai)

- `washiKaki` (#C06030, H:20° S:60%): Persimmon
- `washiKitsune` (#A06030, H:26° S:54%): Fox orange

3. Browns — (Cha) — *UNIQUE to Washi*

- `washiTobi` (#8B4513, H:25° S:76%): Kite/Saddle brown
- `washiKuri` (#5C4033, H:19° S:29%): Chestnut
- `washiRikyucha` (#897858, H:39° S:22%): Rikyu tea (Sen no Rikyū)

4. Golds — (Kin)

- `washiKarashi` (#D0A020, H:44° S:73%): Mustard
- `washiKincha` (#C09010, H:44° S:85%): Gold tea
- `washiYamabuki` (#F8B500, H:44° S:100%): Kerria yellow (vivid)

5. Yellow-Greens — (Moegi)

- `washiUguisu` (#807020, H:50° S:60%): Warbler
- `washiMoegi` (#A0B040, H:69° S:47%): Sprouting green

6. Pinks — (Momo)

- `washiSakura` (#E0B0B0, H:0° S:44%): Cherry blossom
- `washiBotan` (#C05080, H:338° S:50%): Peony

7. Neutrals

- `washiSumi` (#2A2018, H:27° S:27%): Warm ink (brown-black)
- `washiShiro` (#F8F0E0, H:40° S:63%): Paper white (cream)

8. Cool Extensions — H:100–320° gap

"Warm-feeling" cool colors with traditional usage, filling the hue gap while maintaining ΔE 18 to Oceanic.

- `washiKuromidori` (#102808, H:105° S:66%): Black-green (dark pine forest)
- `washiEbizome` (#501858, H:292° S:57%): Grape dye (textile color)
- `washiShikon` (#460E44, H:302° S:66%): Purple navy (warm-blue)

Figure 1.1: Washi-Ink (19 colors). Warm-dominant palette with cool extensions filling H:100–320° gap.

1.2 Washi-Ink Visual Swatches

1.3 Washi-Ink Usage Guidelines

Recommended Subsets

- **4 colors** ($\Delta E \geq 35$): Aka, Karashi, Moegi, Sumi
- **6 colors** ($\Delta E \geq 25$): Aka, Kaki, Tobi, Karashi, Moegi, Botan
- **8 colors** (with markers): Aka, Beni, Kaki, Tobi, Karashi, Uguisu, Sakura, Sumi

Pairs to Avoid

Low perceptual distinctiveness ($\Delta E < 20$)—use secondary encoding:

- Kaki + Kitsune ($\Delta E = 15$) — similar oranges
- Karashi + Kincha ($\Delta E = 12$) — similar golds
- Tobi + Kuri ($\Delta E = 18$) — similar browns (but both dark)

Best For

Use Case	Suitability
Art/humanities papers	Excellent — traditional aesthetic
Cultural/historical content	Excellent — Japanese authenticity
Presentations/posters	Good — warm, inviting feel
Data charts (≤ 6 series)	Good with markers
Scientific papers	Use Oceanic instead

1.4 Oceanic Palette — Morandi → Saturated → Crystal

The **Oceanic** palette provides 21 base colors × 3 tiers = 63 total colors. Nomenclature: `oceanicColor1/2/3`.

Tier 1 (Morandi) Muted base tones, low chroma — for lines, text, subtle accents

Tier 2 (Saturated) Same lightness, higher chroma (C×1.6) — emphasis, active states

Tier 3 (Crystal) Higher lightness (L+0.20), high chroma (C×1.4) — backgrounds, fills

"Quiet → Vivid → Light+Vivid" — T2 is most saturated; T3 trades some chroma for lightness.

Three-Tier Comparison

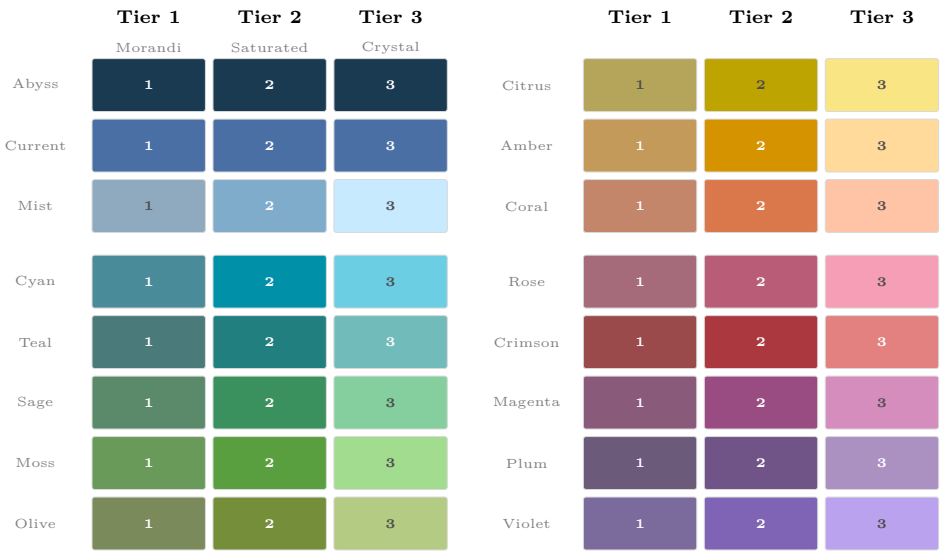


Figure 1.2: Oceanic chromatic colors (16 × 3 = 48). Left: Blues (3) + Greens (5). Right: Warm (5) + Pinks/Purples (3).

Recommended Subsets

- **5 colors** ($\Delta E \geq 40.6$): Current, Sage, Coral, Foam, Ink

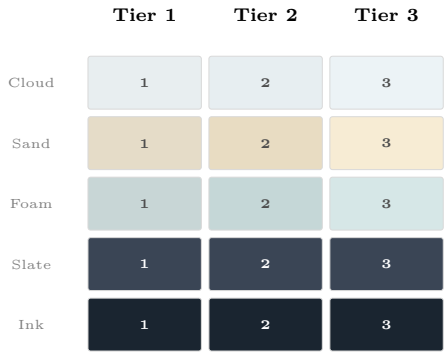


Figure 1.3: Oceanic neutrals ($5 \times 3 = 15$). Cloud/Sand provide graduated backgrounds; Foam/Slate/Ink for structure.

- **6 colors** ($\Delta E \geq 38.9$): Current, Sage, Amber, Foam, Ink, Rose
- **8 colors** ($\Delta E \approx 25$): Current, Moss, Sage, Coral, Crimson, Foam, Ink, Violet

Palette Comparison

Aspect	**Washi-Ink**	**Oceanic**
Aesthetic	Japanese traditional	Scientific-maritime
Dominant hues	Warm (H: 0–70°) + cool ext.	Cool (H: 180–240°)
Total colors	19	63 (21 base $\times$ 3 tiers)
Tier system	—	Morandi / Saturated / Crystal
Color space	HSL	OKLCH (perceptually uniform)
Tier philosophy	—	T2: same L, more C; T3: more L+C
Signature feature	Browns + Purples	Blues (Abyss, Current, Mist)
Cross-palette ΔE	≥ 18 for all chromatic	≥ 18 for all chromatic
Best for	Art, culture, presentations	Science, data, dashboards

1.5 Pairs to Avoid (Both Palettes)

Colors with $\Delta E < 20$ may be confused, especially in small sizes or by viewers with color vision deficiency. Use secondary encoding (patterns, markers, labels) when these pairs must appear together.

Washi-Ink — Pairs to Watch ($\Delta E < 20$)

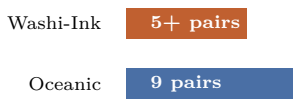
Figure 1.4: Washi-Ink closest pairs. Original 16 warm colors shown; cool extensions add 3 more.

Note: The core Washi palette (16 warm colors) is compact with good internal distinctiveness. The 3 cool extensions fill hue gaps while maintaining ΔE 18 to Oceanic.

Oceanic — High-Risk Pairs ($\Delta E < 15$)

Figure 1.5: Oceanic worst pairs. Dark neutrals (Abyss/Slate/Ink) and extension-base pairs are closest.

Summary



Washi-Ink (19 colors) and Oceanic (63 colors across 3 tiers) provide complementary aesthetics. All cross-palette ΔE 18 for chromatic colors.