Environment The Insects Are Moving, and the Planet Is Sending a Warning

You don’t need a magnifying glass to see that the world is changing. Insects are already showing us. They appear only briefly in the Global Environment Outlook 7 (GEO-7), but together their stories reveal one of the clearest signals of a planet under strain. Across rivers, forests, meadows, farms, and cities, insects are shifting their ranges, disappearing from familiar places, and rising in others. The GEO-7 report captures these changes like flashes of light scattered through its chapters: sometimes a chart, sometimes a paragraph, sometimes a single alarming number. Put together, those flashes form a picture of profound transformation. <span style="font-family:Helvetica; mso-bidi-font-family:" times="" new="" roman";mso-bidi-theme-font:minor-bidi"="">Freshwater Insects: A Crisis Hidden Below the Surface One of the starkest warnings comes from freshwater ecosystems. GEO-7 reports at least 89 documented freshwater species extinctions and 178 more suspected—a total of 267 losses across fish and invertebrates [p. 279]. But the report immediately notes something more troubling: the diversity, distribution, and abundance of many freshwater invertebrates—including aquatic insects—is “much less understood” than those of vertebrates [p. 279]. Even so, the data we do have show declines across major insect groups worldwide. Among the invertebrates that have been assessed: ·<span style="font:7.0pt " times="" new="" roman""=""> Decapods (crabs, shrimp) have the highest proportion of threatened species—about 30% [p. 279]. ·<span style="font:7.0pt " times="" new="" roman""=""> Odonates (dragonflies and damselflies) follow at 16% [p. 279]. These losses are unfolding fastest in tropical regions of South America, Africa, Southeast Asia, and the central United States—areas where biodiversity is richest, and monitoring is most limited [p. 279]. Meanwhile, the spread of aquatic invasive species, many of them invertebrates, has cost the global economy US$345 billion since 1971. In North America alone, invasive invertebrates have caused the most damage to water infrastructure and resources [p. 281]. <span

style="font-family:Helvetica">While infrastructure records are detailed down to the dollar, the lives of many native insects—much smaller, more numerous, and ecologically essential—remain largely unmapped. <span style="font-family:Helvetica; mso-bidi-font-family:" times="" new="" roman";mso-bidi-theme-font:minor-bidi"="">Pesticides Rising as Farmland Shrinks Further on in the report, a troubling pattern emerges. Global agricultural land has been shrinking since 2000, yet pesticide use continues to rise [Figure 6.2, p. 266]. More chemicals on less land means greater runoff into streams, rivers, and wetlands. GEO-7 identifies pollution from fertilizers, pesticides, and herbicides as a significant source of freshwater degradation, often intensified by heavy rain, snowmelt, or poor irrigation systems [p. 266]. For the creatures living at the bottom of food chains—larval mayflies, caddisflies, beetles, midges—these chemical pressures can alter entire life cycles, long before humans notice the water has changed. <span style="font-family:Helvetica; mso-bidi-font-family:" times="" new="" roman";mso-bidi-theme-font:minor-bidi"="">Pollinators on the Move The most vivid insect image in GEO-7 is tucked into a regional chapter. A full-page illustration shows bees and butterflies shifting their ranges across mountain slopes, forests, meadows, and agricultural land [Figure 8.29, p. 413]. The species include: ·<span style="font:7.0pt " times="" new="" roman""=""> Western bumble bee (Bombus occidentalis) ·<span style="font:7.0pt " times="" new="" roman""=""> Hunt’s bumble bee (B. huntii) ·<span style="font:7.0pt " times="" new="" roman""=""> Franklin’s bumble bee (B. franklini) ·<span style="font:7.0pt " times="" new="" roman""=""> Rusty patched bumble bee (B. affinis) ·<span style="font:7.0pt " times="" new="" roman""=""> Western honey bee (<span style="font-

family: Helvetica">Apis mellifera) ·<span style="font:7.0pt " times="" new="" roman""=""> Karner blue (Lycaeides melissa samuelis) ·<span style="font:7.0pt " times="" new="" roman""=""> Edith’s checkerspot (Euphydryas editha) ·<span style="font:7.0pt " times="" new="" roman""=""> Cabbage white (Pieris rapae) ·<span style="font:7.0pt " times="" new="" roman""=""> Gulf fritillary (Agraulis vanillae) Some species are contracting into smaller ranges. Some are shifting into new territory. Others are expanding. GEO-7 describes these as complex shifts driven by changing climate conditions [p. 413]. Pollinators don’t move alone. Their plants shift with them—or fail to. These changes ripple into farming communities, food systems, and rural economies. GEO-7 highlights that heat, altered rainfall, and pollinator decline are now deeply interconnected challenges for many regions [p. 414]. <span style="font-family:Helvetica; mso-bidi-font-family:" times="" new="" roman";mso-bidi-theme-font:minor-bidi"="">Mosquitoes and Ticks Expanding Into New Regions The report also documents the rise of mosquitoes and ticks, which are becoming more widespread as temperatures warm [p. 414]. Across parts of Europe and North America, GEO-7 describes increases in diseases linked to expanding insect vectors, including: ·<span style="font:7.0pt " times="" new="" roman""=""> West Nile fever ·<span style="font:7.0pt " times="" new="" roman""=""> Lyme disease <span

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Malaria</p> <p style="margin-
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family:Helvetica">These trends, the report notes, are directly tied to <span style="font-
family:Helvetica; font-weight:normal">shifts in both vector populations and the pathogens they
carry, primarily driven by warming climates [p. 414].</p> <p style="margin-
top:6.0pt;margin-right:0cm;margin-bottom:6.0pt;margin-left: 0cm;text-align:justify"><span style="font-
family:Helvetica">For many communities, this means encountering diseases that were once considered
“tropical” or limited to distant regions. The insects arrive first. The health risks follow.</p> <p
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align:justify"><span style="font-family:Helvetica; mso-bidi-font-family:" times="" new=""
roman";mso-bidi-theme-font:minor-bidi"="">Insects at the Intersection of Global
Change</p> <p style="margin-top:6.0pt;margin-right:0cm;margin-bottom:6.0pt;margin-
left: 0cm;text-align:justify">Once the pieces are assembled, a clear
through-line emerges in GEO-7:</p> <p style="margin-top:6.0pt;margin-right:0cm;margin-
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family:Symbol; mso-bidi-font-family:Symbol">·<span style="font:7.0pt "
times="" new="" roman""=""> Freshwater
insects are declining, with significant knowledge gaps about their status [p. 279].</p> <p
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style="mso-list:Ignore">·<span style="font:7.0pt " times="" new="" roman""="">
Pollinators are shifting or shrinking their
ranges as climate conditions change [p. 413].</p> <p style="margin-top:6.0pt;margin-
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list:Ignore">·<span style="font:7.0pt " times="" new="" roman""=""> <span
style="font-family:Helvetica">Disease-carrying insects are expanding into new territories [p.
414].</p> <p style="margin-top:6.0pt;margin-right:0cm;margin-bottom:6.0pt;margin-left:
36.0pt;text-align:justify;text-indent:-18.0pt;mso-list:l0 level1 lfo4; tab-stops:list 36.0pt"><span style="font-
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family:Symbol">·<span style="font:7.0pt " times="" new=""
roman""=""> Invasive invertebrates are
spreading and costing billions [p. 281].</p> <p style="margin-top:6.0pt;margin-right:0cm;margin-
bottom:6.0pt;margin-left: 36.0pt;text-align:justify;text-indent:-18.0pt;mso-list:l0 level1 lfo4; tab-stops:list
36.0pt"><span style="font-size:10.0pt; mso-bidi-font-size:12.0pt;font-family:Symbol;mso-fareast-font-

family:Symbol; mso-bidi-font-family:Symbol">·<span style="font:7.0pt " times="" new="" roman""=""> Pesticide use is rising globally, with consequences for waterways and biodiversity [p. 266]. Insects are not minor characters in the global environmental narrative. They are early indicators—responding quickly to temperature, water quality, pollution, and land use. When their movements become erratic, when their numbers dip or explode, they broadcast a signal that ecosystems are being rearranged. The GEO-7 report, without ever dedicating a chapter solely to insects, ends up telling one of the most essential insect stories yet: The smallest creatures on Earth are tracing the outlines of planetary change before our eyes.
 Source: United Nations Environment Programme (2025). Global Environment Outlook 7: A future we choose – Why investing in Earth now can lead to a trillion-dollar benefit for all. Nairobi. https://wedocs.unep.org/handle/20.500.11822/49014 <style>@font-face {font-family:Helvetica; panose-1:0 0 0 0 0 0 0 0 0 0; mso-font-charset:0; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-signature:-536870145 1342208091 0 0 415 0;}@font-face {font-family:"Cambria Math"; panose-1:2 4 5 3 5 4 6 3 2 4; mso-font-charset:0; mso-generic-font-family:roman; mso-font-pitch:variable; mso-font-signature:-536870145 1107305727 0 0 415 0;}@font-face {font-family:Calibri; panose-1:2 15 5 2 2 2 4 3 2 4; mso-font-charset:0; mso-generic-font-family:swiss; mso-font-pitch:variable; mso-font-signature:-520082689 -1073697537 9 0 511 0;}p.MsoNormal, li.MsoNormal, div.MsoNormal {mso-style-unhide:no; mso-style-qformat:yes; mso-style-parent:""; margin:0cm; mso-pagination:widow-orphan; font-size:12.0pt; font-family:"Calibri",sans-serif; mso-ascii-font-family:Calibri; mso-ascii-theme-font:minor-latin; mso-fareast-font-family:Calibri; mso-fareast-theme-font:minor-latin; mso-hansi-font-family:Calibri; mso-hansi-theme-font:minor-latin; mso-bidi-font-family:"Times New Roman"; mso-bidi-theme-font:minor-bidi; mso-font-kerning:1.0pt; mso-ligatures:standardcontextual; mso-fareast-language:EN-US;}p {mso-style-priority:99; mso-margin-top-alt:auto; margin-right:0cm; mso-margin-bottom-alt:auto; margin-left:0cm; mso-pagination:widow-orphan; font-size:12.0pt; font-family:"Times New Roman",serif; mso-fareast-font-family:"Times New Roman";}.MsoChpDefault {mso-style-type:export-only; mso-default-props:yes; font-family:"Calibri",sans-serif; mso-ascii-font-family:Calibri; mso-ascii-theme-font:minor-latin; mso-fareast-font-family:Calibri; mso-fareast-theme-font:minor-latin; mso-hansi-font-family:Calibri; mso-hansi-theme-font:minor-latin; mso-bidi-font-family:"Times New Roman"; mso-bidi-theme-font:minor-bidi; mso-fareast-language:EN-US;}div.WordSection1 {page:WordSection1;}</style>
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