

Agent Orange Exposure Locations

Recognized by VA



Vietnam & Brown Water Veterans

The inland waterways of Vietnam are often referred to as “brown water” because of their muddy color. The naval vessels operating on them are referred to as the Brown Water Navy and/or Mobile Riverine Force. Those who made brief visits ashore and/or served on a ship that was operated on the inland waterways of Vietnam are often referred to as “Brown Water Veterans.”

Blue Water Veterans

The deep offshore waters of Vietnam are often referred to as “blue waters” and naval vessels operating on them are referred to as the Blue Water Navy. Blue Water Veterans are not presumed to have been exposed to Agent Orange or other herbicides unless they actually set foot in Vietnam (including for liberal leave or work detail) or served aboard ships on its inland waterways between January 9, 1962 and May 7, 1975. The Blue Water Navy operated large ships which were used to carry out their missions along the Vietnam coastal waters. Some offshore ships including hospital ships, harbor repair ships, mine sweepers, seaplane tenders, and destroyers sent crew members ashore. Veterans aboard these ships who can show they were on shore will be eligible for the presumption of exposure.

U.S. Navy & Coast Guard Ships In Vietnam

VA maintains an evolving list of U.S. Navy and Coast Guard ships associated with military service in Vietnam and possible exposure to Agent Orange based on military records. This includes ships of the Brown Water and Blue Water Navy that operated on Vietnam’s inland waterways, docked to shore or pier in Vietnam, or that delivered supplies or troops ashore. The alphabetized ships list is available at <http://www.publichealth.va.gov/exposures/agentorange/shiplist/index.asp>.

Korean Demilitarized Zone

Veterans who served in a unit operating along the Korean demilitarized zone anytime between April 1, 1968 and August 31, 1971, and who have a disease VA recognizes as associated with Agent Orange exposure, are presumed to have been exposed to herbicides.

Thailand Military Bases

Vietnam-era Veterans, including U.S. Air Force and Army Veterans, whose service involved duty on the perimeters of military bases in Thailand anytime between February 28, 1961 and May 7, 1975 may qualify for VA benefits.

Herbicide Tests & Storage Outside Vietnam

- The Department of Defense gave VA the below list of dates and locations outside of Vietnam where herbicides were tested and stored. To view the complete list online visit www.publichealth.va.gov/docs/agentorange/dod_herbicides_outside_vietnam.pdf.
- Go to www.publichealth.va.gov/exposures/agentorange/locations/index.asp for more information on each location

Information from Department of Defense (DoD) on Herbicide Tests and Storage outside of Vietnam

| Location | Dates | Agents | Project Description | DoD Involvement |
|--------------------------------|---|---|---|-----------------|
| Fort Chaffee, AR | 5/16/1967-5/18/1967, 7/22/1967-7/23/1967, 8/23/1967 - 8/24/1967 | basic, in-house, improved desiccants and Orange, Blue | During the period of 12/1966 - 10/1967, a comprehensive short-term evaluation was conducted by personnel from Fort Derrick's Plant Science Lab in coordination with contract research on formulations by chemical industry and field tests by USDA and U of HI. | Yes |
| Pinal Mountains near Globe, AZ | 1965, 1966, 1968, and 1969 | 2,4-D isooctyl-ester, 2,4,5-t isooctyl-ester, silvex, propyleneglycolbutylether ester, 2,4,5-T butyl ester, 2,4,5-T 2-e-h e | In 1965, the USFS began a land improvement program in the Pinal Mountains. The program called for spraying an area of chaparral with herbicides to accomplish the objectives of multiple land use. | No |
| Brawley, CA | 1950-51 | 2,4-D | The purpose was to determine means of accomplishing defoliation of | Undetermined |

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| | | | tropical forest vegetation by application of a chemical agent. Here, irrigation water studies were done with the agent. H.F. Arle worked here. | |
| Orlando, FL at Army Grove Air Force's Tactical Center | 3/14/1944, 4/12/1944 | ammonium thiocyanate, zinc chloride, sodium nitrate, sodium arsenate, sodium fluoride | The purpose was to determine means of accomplishing defoliation of tropical forest vegetation by application of a chemical agent. | Yes |
| Marathon, FL | 3/21/1944-3/23/1944 | zinc chloride, ammonium sulphamate, ammonium thiocyanate | The purpose was to determine means of accomplishing defoliation of tropical forest vegetation by application of a chemical agent. Spraying was done here. | Yes |
| Near Lake George, FL | Spring 1944 | zinc chloride | The purpose was to determine means of accomplishing defoliation of tropical forest vegetation by application of a chemical agent. Spraying here. | Yes |
| Orlando, FL, Cocoa, FL | 1944 | ammonium thiocyanate and zinc chloride | Tests were conducted in 1944 by the Army in Orlando and Cocoa areas of Florida to determine the value of ammonium thiocyanate and chloride as marking and defoliation agents.. They were conducted initially at ground level and later from aircraft. | Yes |
| Bushnell Army Air Field, FL | 2/1945 | LN *phenoxy | Small plot experiments were commenced to test the effectiveness of | Yes |

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| | | | LN agents. Various trials were done under contract with the USDA, aided by personnel at Camp Detrick. Here, it was aerial spray experiments on potted plants | |
| Bushnell Army Air Field, Bushnell, FL | 2/1945-4/1945 | 2,4-D and its ammonium salt | Trials, performed by C.W.S. personnel from Camp Detrick, MD tested the practicability of severely injuring or destroying crop plants sprayed from smoke tanks mounted on tactical aircraft. | Yes |
| Avon Air Force Base, FL | 2/1951- 4/1951 | butyl 2,4 D | Trials were conducted at Avon Air Force Base, FL by Chemical Corps with personnel of the Air Force and Navy to determine the practical effectiveness of spraying pure anticrop agents from at low volume from aircraft. C-47 and Navy XBT2D-1 aircraft with various nozzles were used. | Yes |
| Englin Air Force Base, FL | 11/1952-12/1952 | 2,4-D, 2,4,5-T: 143 and 974, respectively | Two trials: Chemical Corps-concerned with basic fundamental work, using 2,4-D, Air Force-concerned with evaluating prototype large capacity spray system for aircraft installation using 2,4,5-T, primarily. Used 3 atomizing nozzles: Bete Fog Nozzles, Whirljet | Yes |

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| | | | Spray Nozzles, and Fogjet 1.5F50 | |
| Avon Park Air Force Base, FL | Spring 1954 | butyl 2,4-D, butyl 2,4,5-T, Isopropyl 2,4-D | Series of tests were conducted at Avon Park AFB during the spring of 1954 to study the behavior of chemical anticrop aerial sprays when released from high-speed jet aircraft. The Navy F3D jet fighter was used with Aero 14A Airborne Spray Tanks to disperse the anticrop agents. | Yes |
| Jacksonville,FL | 7/18/1962-7/21/1962 | Purple, Fuel Oil, Mix | The HIDAL was used successfully on an H-34 helicopter to spray herbicidal materials. Therefore, it had not been calibrated previously. Spray tests were performed to do so. This was done under order by OSD/ARPA. | Yes |
| Eglin AFB, FL, C-52A test area | 1962-70 | Orange (1962-68), Purple (1962-68), White (1967-70), Blue (1968-70) | CPT John Hunter discussed vegetation changes and ecological studies of the 2 square mile test area which had been sprayed with herbicides over the period 1962-70. | Yes |
| Apalachicola National Forest near Sophopy, FL | 5/3/1967-5/8/1967 | basic desiccants and Orange/Blue | During the period of 12/1966 - 10/1967, a comprehensive short-term evaluation was conducted by personnel from Fort Detrick's Plant Science Lab in coordination with contract research on | Yes |

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| | | | formulations by chemical industry and field tests by USDA and U of HI | |
| Eglin AFB, FL | 6/11/1968-9/12/1968 | orange, Bifluid #1, Bifluid#2, Stull Bifluid | A spread factor study was performed by the Army to correlate the spherical drop sizes of both Orange and Stull Bifluid defoliant. It involved development of new techniques to determine spread factors over an extended range of drop sizes. A spinning cup drop generator was used. | Yes |
| 2 areas in FL, 2 areas in GA, and 1 in TN | 1968 | bromacil, Tandex, monuron, diuron, and fenuron | In 1968, emphasis was given to soil applied herbicides for grass control. Applications were made by a jeep-mounted sprayer on small plots or by helicopter on larger plots. | Undetermined |
| GA and TN | 1964 | diquat and Tordon 101, various | In 1964, helicopter spray tests were conducted on transmission line rights-of-way by the Georgia Power Company and Tennessee Valley Authority in collaboration with Fort Detrick to evaluate effectiveness of several commercially available herbicides. | Yes |
| Fort Gordon, GA | 7/15/1967-7/17/1967 | in-house desiccants mixtures and formulations, Orange and Blue | During the period of 12/1966 - 10/1967, a comprehensive short-term evaluation was conducted by personnel from Fort | Yes |

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| | | | Detrick's Plant Science Lab in coordination with contract research on formulations by chemical industry and field tests by USDA and U of HI | |
| Kauai Branch Station near Kapaa, Kawai, HI | 6/1967, 10/1967, 2/1968, 12/1967 | Blue,diquat,paraquat, Orange, PCP, Picloram, White, HCA, 2,4,5T, Endothall | During the period of 12/1966 - 10/1967, a comprehensive short-term evaluation was conducted by personnel from Fort Detrick's Plant Science Lab in coordination with contract research on formulations by chemical industry and field tests by USDA and U of HI | Yes |
| State Forest area, 3500 ft. elevation on slope of Mauna Loa, near Hilo, HI | 12/2/1966, 12/4/1966, 1/12/1967 | Orange, M-3140, TORDON ester, 2,4-D ester, 2,4,5-T ester | The purpose of this project was to evaluate iso-octyl ester of picloram (TORDON) in mixtures with ORANGE, as a candidate defoliant agent, using ORANGE as standard. There were personnel from Fort Detrick there. | Undetermined |
| Hilo, HI | 12/1966 | Orange | Field tests of defoliants were designed to evaluate such variables as rates, volume of application, season, and vegetation. Data from aerial application tests at several CONUS and OCONUS locations are provided in tables. There were Fort Detrick personnel there. | Yes |

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| Kauai, HI | 1967 | Orange | Field tests of defoliants were designed to evaluate such variables as rates, volume of application, season, and vegetation. Data from aerial application tests at several CONUS and OCONUS locations are provided in tables. | Yes |
| Vigo Plant CWS, Terre Haute, IN | 5/1945- 9/1945 | LN (see attached) *phenoxy | Small plot experiments were commenced to test the effectiveness of LN agents. Various trials were done under contract with the USDA, aided by personnel at Camp Detrick. Here, it was aerial trials spraying field grown plants. | Yes |
| Jefferson Proving Grounds, Madison, IN | Summer 1945 | LN *phenoxy | Small plot experiments were commenced to test the effectiveness of LN agents. Various trials were done under contract with the USDA, aided by personnel at Camp Detrick. Here, it was dropping trials. | Yes |
| Hays, KS, Langdon, ND | 1960 | stem rust of wheat | Two studies on the stem rust of wheat were conducted during 1960 to obtain data on the establishment, development, and destructiveness of artificially induced stem rust epiphytotics. | Undetermined |
| Fort Knox, KY | 1945 | various | In 1945, a special project known as Sphinx was conducted jointly by CWS and the ARML to | Yes |

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| | | | investigate the use of chemical agents for increasing the flammability of vegetation prior to flame attack. | |
| Area B, Camp Detrick, MD | Spring/Summer 1953 | 3:1 mixture 2,4-D and 2,4,5-T | Personnel at Camp Detrick tested the feasibility of using an experimental spray tower for applying a mixture of chemical anticrop agents to broad-leaf crops. | Yes |
| Fort Ritchie, MD | 1963 | Tordon, 2,4-D, Orange, diquat, endothal, and combinations of each with Tordon | Various studies were done to explore the effectiveness of different herbicides. They were all field trials. These studies were done by personnel from the US Army Biological Laboratories. | Yes |
| Fort Meade, MD | 1963 | cacodylic acid, Dowco 173, butyediol | Various studies were done to explore the effectiveness of different herbicides. They were all field trials. These studies were done by personnel from the US Army Biological Laboratories. | Yes |
| Camp Detrick, MD-Fields A,B, and C | 1946-1947 | 2,4,5-T, 2,4,5-T triethanolamine, tributylphosphate, ethyl 2,4-D, butyl 2,4,5-Triet 2,4-D, | The experiments were directed mainly towards the investigation of plant inhibitors applied as sprays or to the soil in the solid form to be taken up by the roots. | Yes |
| Camp Detrick, MD-Fields C,D, and E | 1948 | 2,4,5-T, isopropyl phenol carbamate, LN-2426, 2,4-D | The experiments were directed mainly towards the investigation of plant inhibitors | Yes |

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| | | | applied as sprays or to the soil in the solid form to be taken up by the roots. | |
| Camp Detrick, MD-Fields C,D,E | 1949 | triethelyne. 2,4,5-T, carbamates | The experiments were directed mainly towards the investigation of plant inhibitors applied as sprays or to the soil in the solid form to be taken up by the roots. Experiments were done by Ennis, DeRose, Newman, Williamson, DeRigo, and Thomas. | Yes |
| Camp Detrick, MD-Fields A,B,D,E | 1950 | 2464, butyl 2,4-D, 974, butyl 2,4,5-T, q;q 143 and 974 | The experiments were directed mainly towards the investigation of plant inhibitors applied as sprays or to the soil in the solid form to be taken up by the roots. Experiments were done by Ennis, DeRose, Acker, Newman, Williamson, and Zimmerly. | Yes |
| Camp Detrick, MD-Field F | 1950-51 | 2464, carbamate, butyl 2,4-D, 143 and 974 (orange?),2,4,5-T, 2,4-D, Orange | The experiments were directed mainly towards the investigation of plant inhibitors applied as sprays or to the soil in the solid form to be taken up by the roots. Experiments were done by Acker, DeRose, McLane, Newman, Williamson, Baker, Dean, Johnson, Taylor, Walker, and Zimmerly. | Yes |

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| Fort Detrick, MD; Fort Ritchie, MD | 1956-1957 | various, 577 compounds | In 1956 And 1957, defoliation and desiccation were carried out at Fort Detrick and Fort Ritchie, Maryland by the Chemical Corps and Biological Warfare Research. These were bench tests. | Yes |
| Poole's Island, Aberdeen Proving Ground, MD | 7/14/1969- | Orange, Orange plus foam, Orange plus foam Orange, Foam | During the week of 7/14/1969, personnel from Naval Applied Science Laboratory in conjunction with personnel from Limited War Laboratory conducted a defoliation test along the shoreline. | Yes |
| Fort Detrick, MD | 8/1961-6/1963 | 1410 compounds | From 8/1961 to 6/1963, compounds were spray-tested in the greenhouse to evaluate them as effective defoliants, desiccants, and herbicides. | Yes |
| Near Wayside, Miss., Wilcox Road, Greenville, Miss. | 9/19/1967 | picloram, bromacil, pyriclor, and terbacil, Orange, cacodylic acid | In 1967, the Dow Chemical Company was awarded a DoD research contract. The objective was to prepare as pellets mixtures of various herbicides and to test them on varying vegetation situations for the control of a range of plant species. | Undetermined |
| Fulcher Ranch, Greenville, Mississippi | 4/15/1968 | picloram and bromicil | In 1967, the Dow Chemical Company was awarded a DoD research contract. The objective was to prepare as pellets mixtures of various herbicides and to test them on varying vegetation | Undetermined |

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| | | | situations for the control of a range of plant species. | |
| Gulfport, Miss. | 1968-1970 | Orange | While discussing the mandatory disposal of Orange, it was mentioned that 15,161 drums were being stored at Gulfport, Mississippi. | Yes |
| Galatin Valley near Bozeman, Montana | 7/3/1953, 7/6/1953, 7/14/1953 | 4- fluorophenoxy-acetic acid and 2 of its esters, 3:1 butyl 2,4-D and butyl 2,4,5-T | A preliminary series of field evaluations of chemical agents for attacking wheat using a miniature spraying system mounted on light aircraft were performed by USDA. | No |
| Fort Drum, NY | 1959 | Orange | The Commanding General, 1st US Army, requested that Ft Detrick assist with defoliation efforts at Ft Drum. Thirteen drums were sprayed there on 4 square miles from a helicopter spray device. | Yes |
| Stone Valley Experimental Forest in Huntington County and near State College in Centre County, PA | 3/1969-10/1970 | bromacil, diuron, tandex, fenuron, picloram | Soil- applied herbicides were studied by the U of Pa with Ft Detrick for 18 months for their effectiveness, rapidity of action, and duration of response in native stands of central PA grasses, broadleaf weeds and woody plants. These herbicides were spread or sprayed. | Undetermined |
| Kingston, RI | 7/26/1949, 1950-51 | trieth.2,4,5-T, butyl 2,4,5-T,974 | The experiments were directed mainly towards the investigation of plant inhibitors applied as sprays or | Yes |

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| | | | to the soil in the solid form to be taken up by the roots. Experiments were carried out under supervision of T.E. Odland if RI State College. H.T. DeRigo was also there. | |
| Beaumont, TX | 6/1944 | LN *phenoxy | Small plot experiments were commenced to test the effectiveness of LN agents. Various trials were done under contract with the USDA, aided by personnel at Camp Detrick. Here, they were testing on rice crops. | No |
| Marinette, WI, Weslaco, TX | 5/1967-1/1969 | arsenic compounds, Orange, cacodylic acid, sodium cacodylate | 71 new arsenic compounds were tested in primary screening against 6 plant species in greenhouse tests. Then, 5 of the most active compounds were tested in field trials against Red Maple and compared to formulations of cacodylic acid and a 50:50 blend of orange and sodium cacodylate. The Ansul Co. for DoD. | Yes |
| Beaumont, TX | 1950-51 | 2,4-D | The purpose was to determine means of accomplishing defoliation of tropical forest vegetation by application of a chemical agent. Here, irrigation water studies were done with the agent. Coghill, Hasse, and Yeatner worked here. | Undetermined |

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| Granite Peak, UT | Summer 1945 | LN *phenoxy | Small plot experiments were commenced to test the effectiveness of LN agents. Various trials were done under contract with the USDA, aided by personnel at Camp Detrick. Here, it was dropping trials. | Yes |
| Prosser, WA | 1950-51 | 2,4-D | The purpose was to determine means of accomplishing defoliation of tropical forest vegetation by application of a chemical agent. Here, irrigation water studies were done with the agent. V.F. Burns worked here. | Undetermined |
| southeastern part of Kompong Cham Province and Dar and Prek Clong plantations, Cambodia | 6/1969 | Orange | In 6/1969, the US government received notice of charge by Cambodian government that major defoliation damage to the Cambodian rubber plantation near the RVN border had occurred as a result of US defoliation activity. This was confirmed by a team of experts. | Yes |
| Base Gagetown near Fredericton, New Brunswick, Canada | 6/20/1967-6/24/1967 | basic desiccants and Orange, Blue, various | During the period of 12/1966 - 10/1967, a comprehensive short-term evaluation was conducted by personnel from Fort Detrick's Plant Science Lab in coordination with contract research on formulations by chemical industry | Yes |

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| | | | and field tests by USDA and U of HI | |
| Kumbla, South India | 1945-1946 | LN compounds *phenoxy | The main objective of the experiments was to determine the feasibility of accomplishing severe injury or destruction of tropical food crops by the application of growth-inhibiting (LN*) compounds in static trials. Field plantings were treated with various agents at different rates in different forms. | Yes |
| Korea, third Brigade, 2nd Division area | 7/23/1968- 7/24/1968 | Hyvar XWS, tandex, Urox B, Urox Oil concentrate (liquids) bromacil, tandex, Urox 22 (solids) | In 1968, chemicals were sent from the Plant Sciences Lab, Ft Detrick, MD, to the Republic of Korea for the purpose of testing their effectiveness in the control of vegetation. | Yes |
| Korea, 2nd and 4th Brigades, 2nd Division area | 8/1968 | Hyvar XWS, tandex, Urox B, Urox Oil concentrate (liquids) bromacil, tandex, Urox 22 (solids) | In 1968, chemicals were sent from the Plant Sciences Lab, Ft Detrick, MD, to the Republic of Korea for the purpose of testing their effectiveness in the control of vegetation. | Yes |
| Korea, third Brigade, 2nd Division area | 10/3/1968 | Hyvar XWS, tandex, Urox B, Urox Oil concentrate (liquids) bromacil, tandex, Urox 22 (solids) | In 1968, chemicals were sent from the Plant Sciences Lab, Ft Detrick, MD, to the Republic of Korea for the purpose of testing their effectiveness in the control of vegetation. | Yes |

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| Laos | 12/1965- 1967 | Orange | In December 1965, herbicide operations were begun in Laos, with sorties being flown from Tan Son Nhut and Da Nang. The purpose was the exposure of foot trails, dirt roads and other LOCs that crossed into SVN. This network leads from NVN, through the eastern panhandle, to Cambodian border. | Yes |
| Las Marias, Puerto Rico | 2/1967- 12/1967 | various, including Orange | During the period of 12/1966 - 10/1967, a comprehensive short-term evaluation was conducted by personnel from Fort Detrick's Plant Science Lab in coordination with contract research on formulations by chemical industry and field tests by USDA and U of HI | Yes |
| Near Rio Grande, on the northeast coast of Puerto Rico | 8/23/1967, 10/18/1967, 12/21/1967-12/26/1967 | picloram, bromacil, pyriclor, and terbacil | In 1967, the Dow Chemical Company was awarded a DoD research contract. The objective was to prepare as pellets mixtures of various herbicides and to test them on varying vegetation situations for the control of a range of plant species. | Undetermined |
| Loquillo, Puerto Rico | 4/1966, 10/1966 | Orange | Field tests of defoliant were designed to evaluate such variables as rates, volume of application, season, and vegetation. Data from aerial application tests at several CONUS and | Yes |

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| | | | OCONUS locations are provided in tables. | |
| At Sea | Summer 1977 | Orange | In 1977, the USAF incinerated 2.22 million gallons of Herbicide Orange at sea in an operation entitled PACER HO. Extensive industrial hygiene sampling efforts supporting the transfer operations at Gulfport, MS and Johnston Island indicated all exposures were inconsequential (2-3 orders of magnitude below the TLVs for 2,4-D and 2,4,5-T). | Yes, Gulfport No, JI |
| Thailand | 1964-1965 | Purple, Orange, Others | Sponsored by ARPA; ARPA Order 423, Between the mentioned dates, there was a large-scale test program to determine effectiveness of mentioned agents in defoliation of upland forest or jungle vegetation representative of SEA. | Yes |
| Thailand | 1964-65 | Orange, Blue | Field tests of defoliants were designed to evaluate such variables as rates, volume of application, season, and vegetation. Data from aerial application tests at several CONUS and OCONUS locations are provided in tables. | Yes |
| Replacement raining Center of the Royal Thai | 1964 and 1965 | Orange, Purple | An extensive series of tests were conducted by Fort | Yes |

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| Army near Pranburi, Thailand | | | Detrick during 1964 and 1965 in collaboration with the Military Research and Development Center of Thailand. The objective was to perform onsite evaluation of phytotoxic chemicals on vegetation in SE Asia. | |
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[Source: Agent Orange Newsletter | Summer 2015 ++]