Dataset Description	
Dataset Title	**NCCOS Assessment: Island sources and destinations of virtual larvae for the Mariana region, simulation results (2004 to 2012)**
Abstract	This tabular dataset is the result of computer simulations conducted by NOAA scientists and their partners to estimate the transport of marine larvae between islands in and around the Mariana Archipelago. The table consists of the number of virtual larvae transported from each source to each destination based on several scenarios. Separate simulations were conducted for 4 larval durations and 2 settlement zones (labelled as "multispecies"), and also customized for 6 priority species. Species included yellowfin goatfish (*Mulloidichthys flavolineatus*), post-larval scribbled rabbitfish (*Siganus spinus*), humphead wrasse (*Cheilinus undulatus*), bluespine unicornfish (*Naso unicornis*), and crown-of-thorns seastar (*Acanthaster planci)*. For a complete description of the modelling and analysis approach see Kendall and Poti (eds) 2015. Keywords: Coral Reef Organisms; Larvae; Mariana Islands; Ocean Currents; Computer Simulation; Remote Sensing; Geographical Distribution
Purpose	The overall goal of the assessment was to evaluate ocean currents as a mechanism of transport and to compare connectivity among larvae with different life-history characteristics using computer simulations. Understanding the strength and geographic patterns of this larval connectivity is an important part of managing marine ecosystems through ecosystem based-fisheries management plans, marine protected area (MPA) network design, recovery strategies for endangered species, and promoting reefs that are resilient to disturbance. Sufficient sources of larvae must be maintained to sustain future generations. This data set is the result of the connectivity simulations.
Methods	Computer simulations were used to track cohorts of virtual larvae transported according to an ocean circulation model. Daily current vectors for the 0-10 m depth layer were from the Hybrid Coordinate Ocean Model's (HYCOM) Global Hindcast. Virtual larvae were spawned seasonally from 2004-2012 at each of 116 starting locations. Larval production was scaled to each island's area of potential reef ecosystem. Maximum Pelagic Larval Durations (PLD) of 10, 20, 50, and 100 days were simulated where larvae were competent to settle once 60% of their maximum PLD elapsed. In one set of simulations, representing larvae with minimal swimming capabilities, larvae could only settle at a destination with potential reef habitat. In another set of simulations, representing larvae with strong sensory and swimming capabilities, larvae could settle anyplace within 18 km of potential reef habitat. A constant mortality rate was applied following competency, which resulted in 100 % mortality by the end of each maximum PLD. Those multi-species simulations resulted in 3767680 rows of output. In addition, simulations were customized for mass spawning corals (n = 484416 rows), post-larval yellowfin goatfish (*Mulloidichthys flavolineatus*) (n = 121104 rows), post-larval scribbled rabbitfish (*Siganus spinus*) (n = 127008 rows), humphead wrasse (*Cheilinus undulatus*) (n = 470960 rows), bluespine unicornfish (*Naso unicornis*) (n = 242208 rows), and crown-of-thorns seastar (*Acanthaster planci)* (n = 121104 rows). Numbers of larvae transported in each simulation from each source to each destination were tabulated and are provided here. For a complete description of the modelling and analysis approach see Kendall and Poti (eds) 2015.
Citations	Kendall, M.S., and M. Poti (eds). 2015. Transport pathways of marine larvae around the Mariana Archipelago. NOAA Technical Memorandum NOS NCCOS 193. Silver Spring, MD 130 pp. https://repository.library.noaa.gov/view/noaa/929
Project Webpages	https://coastalscience.noaa.gov/projects/detail?key=195 http://www.coris.noaa.gov/activities/larvae_transport_marianas/
Related Web Services	[blank]
Start Date	2004-01-01
End Date	2012-01-01
Northern Boundary	35.0000
Southern Boundary	2.0000
Western Boundary	120.0000
Eastern Boundary	175.0000

People, Projects, and Keywords	
Principal Investigator	Matt Kendall, matt.kendall@noaa.gov US DOC; NOAA; NOS; National Centers for Coastal Ocean Science (NCCOS)
Additional Principal Investigator	Matt Poti, matt.poti@noaa.gov US DOC; NOAA; NOS; National Centers for Coastal Ocean Science (NCCOS) and Consolidated Safety Services
Primary Point of Contact	Matt Kendall, matt.kendall@noaa.gov US DOC; NOAA; NOS; National Centers for Coastal Ocean Science (NCCOS)
Collaborators	Tim Wynne - US DOC; NOAA; NOS; National Centers for Coastal Ocean Science (NCCOS) Chris Barker, Caitlin OConner - US DOC; NOAA; Office of Response and Restoration (ORR) Peter Houk – University of Guam
Authors	Kendall, Matt; Poti, Matt; Wynne, Tim; Barker, Chris; OConner, Caitlin; Houk, Peter
NCCOS Base Funding	US DOC; NOAA; NOS; National Centers for Coastal Ocean Science (NCCOS)
Other Funding Agency	US DOC; NOAA; NOS; Coral Reef Conservation Program (CRCP)
Partner Entity	Commonwealth of the Northern Mariana Islands, Bureau of Environmental and Coastal Quality
NCCOS Projects	"How do Ocean Currents Connect Coral Reefs among Islands in the Mariana Archipelago, and How will Climate Change Affect Them?"
Other Projects	[blank]
Sea Areas or Regions	Western Pacific International Coral Reefs Mariana Archipelago
Marine Protected Areas	[blank]
NOAA Ships	[blank]
Other Ships or Platforms	[blank]
NCCOS Research Priorities	Marine Spatial Ecology (MSE) Coastal Resiliency and Climate Vulnerability (CRCV)
NCCOS Research Topics	Coral Reefs Predictive/Spatial Modeling
NCCOS Research Locations	International
U.S. States and Territories	Commonwealth of the Northern Mariana Islands Guam
NCCOS Geographic Areas	Coral Reefs
NCCOS Research Data Types	Geospatial Model
ISO Topic Categories	geoscientificInformation oceans biota
Comment	*[blank]*
Resource Provider	*NCCOS Data Manager* *NCCOS.data@noaa.gov* *US DOC; NOAA; NOS; National Centers for Coastal Ocean Science (NCCOS)*
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Approved by NCCOS Official	*John Christensen* *Branch Chief* *US DOC; NOAA; NOS; National Centers for Coastal Ocean Science (NCCOS); Center for Coastal Monitoring and Assessment (CCMA); Biogeography Branch*

Data File Description	
File Name	Marianas_connectivity_results_mastertable.csv
File Format	CSV
File Size	516 MB
Parameter or Variable	Number of virtual larvae going from source to destination
Property Type	Calculated
Units	Number of larvae
Observation Category	model output
Sampling Instrument	documentation only – no instrument type
Sampling and Analyzing Method	The data table is the result of computer simulations. Virtual larvae were advected based on the Hybrid Coordinate Ocean Model (HYCOM) and tracked using the General NOAA Modeling Environment (GNOME). Model error and variance were controlled using tracks from NOAA's Global Drifter Program. For a complete description of the modelling and analysis approach see Kendall and Poti (eds) 2015.
Data Quality Method	Transport simulations were reviewed and accepted by subject matter experts and compared to results from drifter and genetic studies. For a complete description of the processing and analysis methods see Kendall and Poti (eds) 2015.

Data Dictionary				
Variable Name	**Variable Label**	**Required**	**Format**	**Description**
Species	species	yes	Char (30)	Species or species group modelled.
Source site number	sourcesite	yes	Num (3)	Source of virtual larvae in the simulation listed as a number.
Source name text	sourcename	yes	Char (70)	Source of virtual larvae in the simulation listed as text.
Number of starting larvae	numlarvae	yes	Num (6)	The number of larvae beginning the simulation.
Destination site number	destsite		Num (3)	Destination of virtual larvae in the simulation listed as a number.
Destination name text	destname	yes	Char (70)	Destination of virtual larvae in the simulation listed as text.
Date	date	yes	Num (8)	Start date of the simulation m/d/year.
Pelagic larval duration	pld	yes	Num (3)	Maximum pelagic larval duration.
Settlement zone buffer size	buff	yes	Num (2)	Size of the settlement zone around each destination.
Probability of connection	pconnect	yes	Num (10)	The probability of larvae going from a source to a destination.
Number of larvae connected	nconnect	yes	Num (6)	Number of the starting larvae from the source that arrived at the destination.