

The Search for Amelia Earhart: Expedition to Nikumaroro



by

Lew Toulmin, Ph.D., F.R.G.S.

September 2017



Llewellyn "Lew" Toulmin, Ph.D.

- Former Chair, Section on Emergency Management, American Society for Public Administration
- Consultant to 20+ US Federal agencies and 30+ foreign countries
- Fellow of the Royal Geographical Society
- Expeditions in search of missing aircraft, persons, battlefields, plantations and towns
- Ph.D. in public administration & economics
- Traveled to 144 of the 196 countries on Earth
- Co-founder, Missing Aircraft Search Team



GONE!
My top 10

WHO	WHEN	WHERE
Ambrose Bierce, writer	1913	Juarez (?), Mexico
Percy Fawcett, explorer	1925	Amazonia, Brazil
Judge Joseph Crater	1930	New York City
Amelia Earhart, aviator	1937	Pacific Ocean
Richard Halliburton, adventurer	1939	North Pacific
Gertrude Tompkins, WW II WASP pilot	1944	California near LAX
Prof. Jesus de Galindez	1956	New York City
Jim Thompson, ex-OSS, CIA asset, "Silk King"	1967	north central Malaysia
D. B. Cooper, air pirate	1971	Washington State, USA
Jimmy Hoffa, labor leader	1975	near Detroit, MI



Today we will cover these topics:

- ✓ The exciting life of Amelia Earhart (AE)
- ✓ The disappearance and search
- ✓ Theories re the disappearance
- ✓ Expedition to Nikumaroro
- ✓ Evidence for Niku
- ✓ Conclusions



Flag of the Republic of Kiribati



Nikumaroro island, Rep. of Kiribati

The Exciting Life of Amelia Earhart



Tomboy "Milly" born 1897, Atchison, KS...

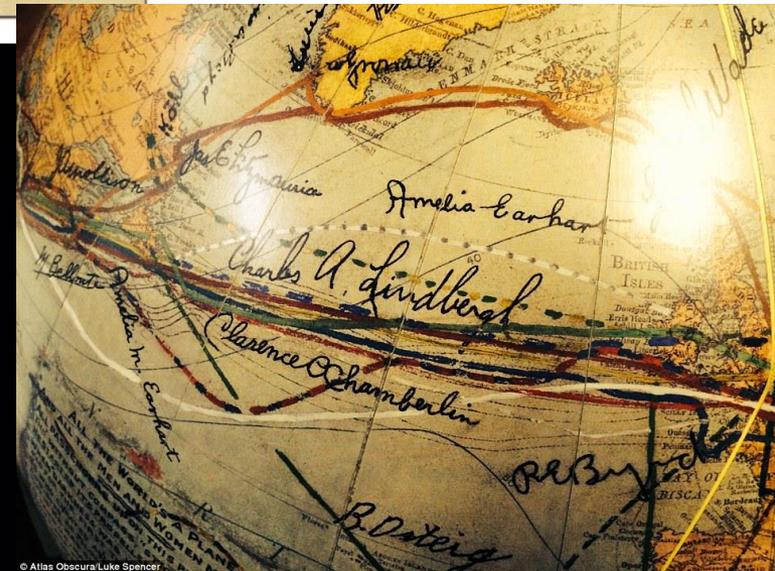


...schooled in Chicago & Philly



- 1919: Nurse's aide
- 1920: first air ride
- 1921: pilot's license
- 1924: teacher of Syrian immigrant kids
- 1927: Lindbergh trans-Atlantic; woman?
- 1928: AE trans-Atlantic in 3-person crew, 1st woman, lectures, book
- 1931: marries George Putnam
- 1932+: new records, lectures

First woman to fly solo trans-Atlantic, 1932



Gold Medal was presented to Amelia Earhart by President Hoover in Washington on June 21, 1932.

Then – a new plane for the ultimate project



1937

AMELIA

The Disappearance and Search



The Purdue Exponent

Published Daily by Students of Purdue University

VOLUME XLVIII

LAFAYETTE, INDIANA, THURSDAY, MARCH 18, 1937

NUMBER 118

EARHART STARTS ON WORLD FLIGHT



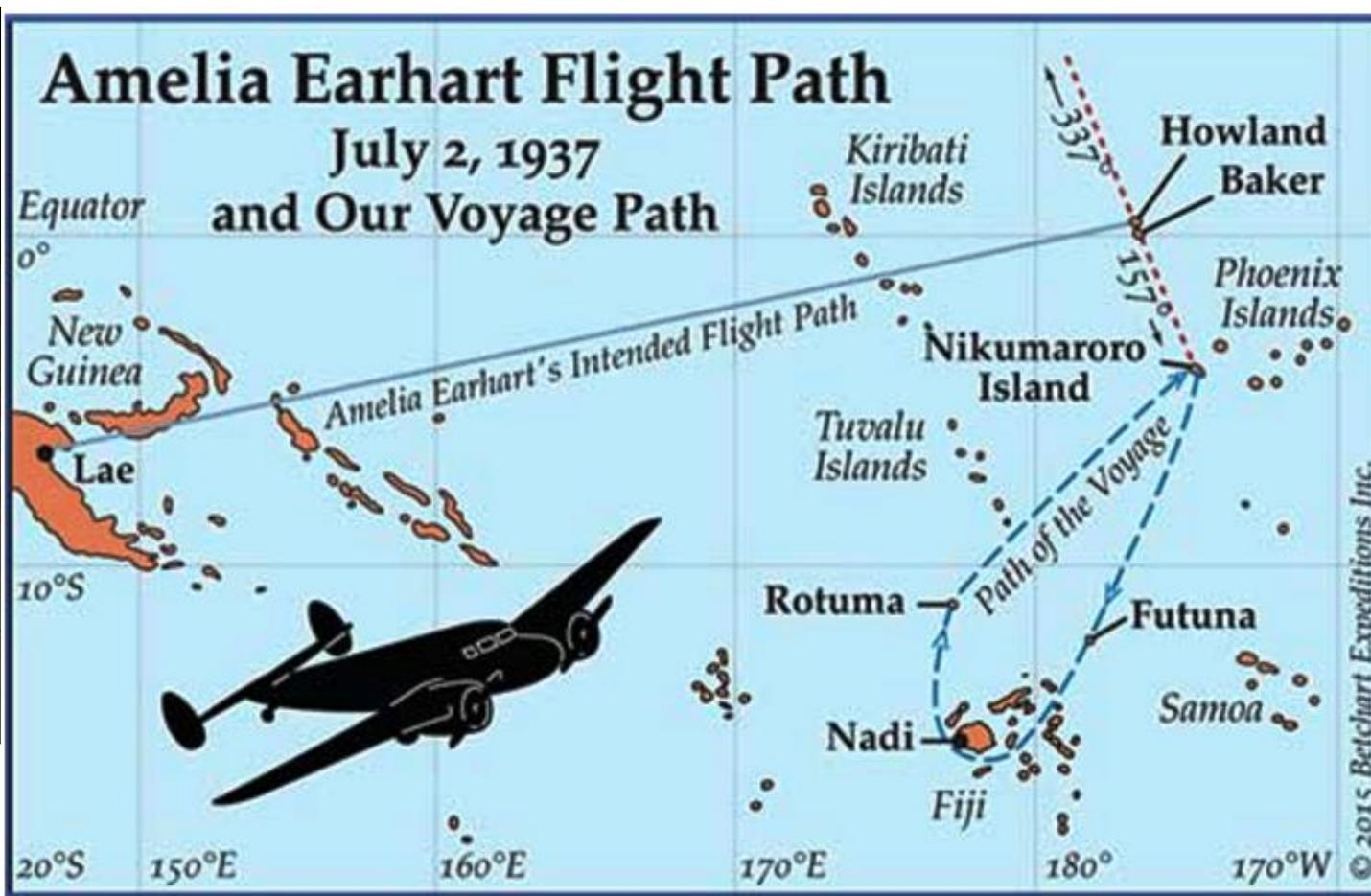
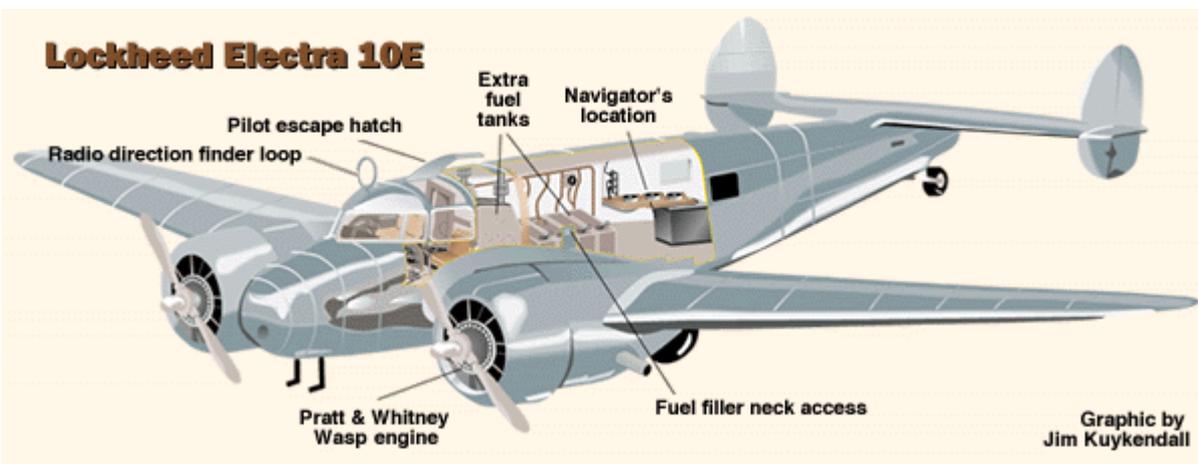
Earhart's Lockheed Electra 10E

The fuselage was specially modified to fit a larger fuel tank.

EARHART'S FLIGHT PATH

With departure dates from select cities







JULY 2, 1937

- 0646: "About 100 miles out..."
- 0741: "We are on you but cannot see you...flying at 1000 feet..."
- 0804: "We cannot hear you..." (AE unable to get RDF directions)
- 0843: "We are on the line 157-337... flying north and south"



Tiny Howland is in this photo, taken at 1000 ft.

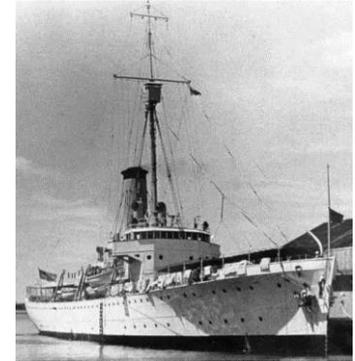


Howland: 1.5 x 0.5 miles, 15 ft. high

Apparent crash
of the Electra
by 1040...



...USCG cutter
Itasca begins
search



DAILY NEWS **FINAL**
NEW YORK, SATURDAY, JULY 3, 1931
Vol. 33, No. 6
22 Pages
NEW YORK, SATURDAY, JULY 3, 1931
\$1.000,000
Daily - \$1,700,000
Sunday - 2,000,000

EARHART PLANE LOST AT SEA



Amelia Earhart Missing on World Flight

Excitedly disembarking their craft, Amelia Earhart and Fred Noonan (left), her navigator, were believed down in the Pacific near Howland Island, an 8,350-mile leg from Los, New Guinea. Fliers thought they would have for some time. This picture was made at Karachi, India, on the day they were greeted by Vincent Brown (right) on arrival there on globe-girdling flight.

1937. P P TWO CENTS in New York CITY. THREE CENTS Elsewhere Except Where Shown. FOUR CENTS Elsewhere Except in 70¢ and 50¢ Postal Zones.

DRAWN **MISS EARHART FORCED DOWN AT SEA, HOWLAND ISLE FEARS; COAST GUARD BEGINS SEARCH**

FUEL HAD RUN LOW
Fliers Were Near Goal When Last Reported but Saw No Land

PLANE EQUIPPED TO FLOAT
Has Sealed Gasoline Tanks and a Rubber Lifeboat for Emergency at Sea

RADIO BELIEVED HEARD

ROUTE OF EARHART PLANE IN PACIFIC

UNIVERSAL NEWSREEL

60 PLANES SCAN SEA IN VAIN FOR MISS EARHART

Float planes from USS *Colorado* search to the south

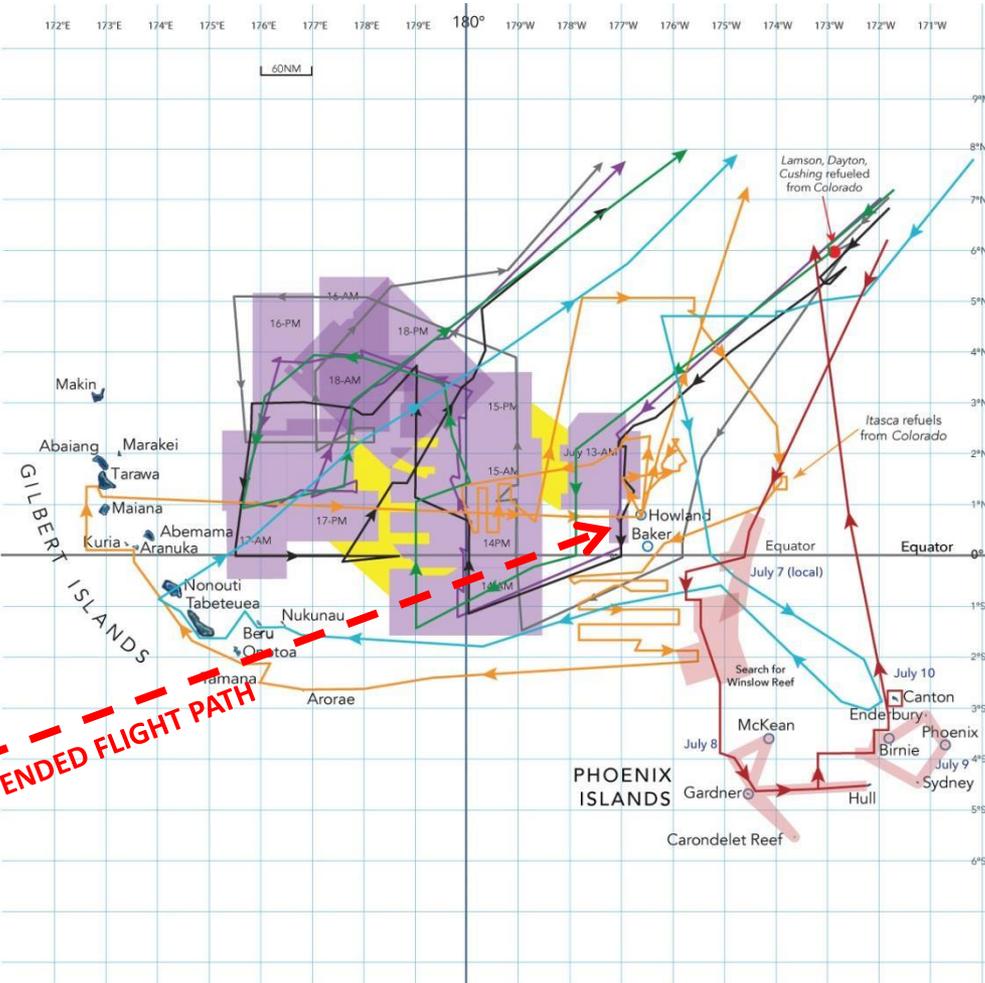
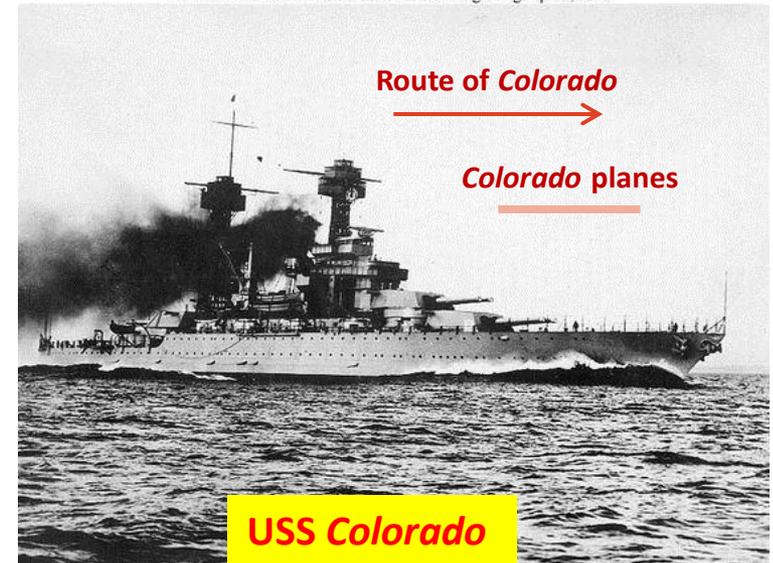


Photo # NH 55274 USS Colorado steaming at high speed, 1923

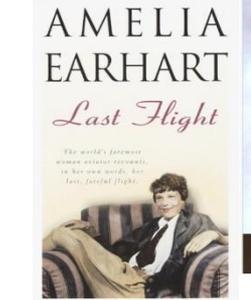
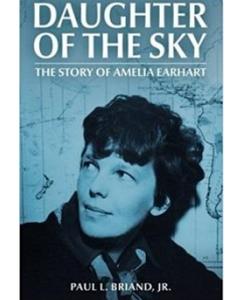
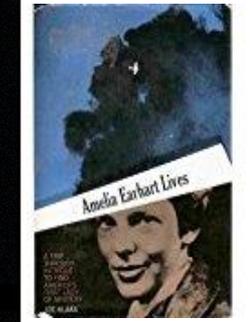
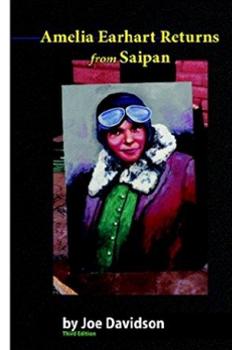
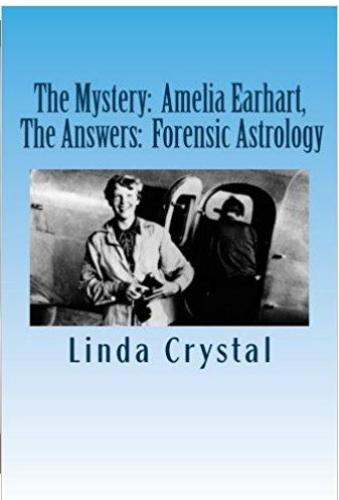
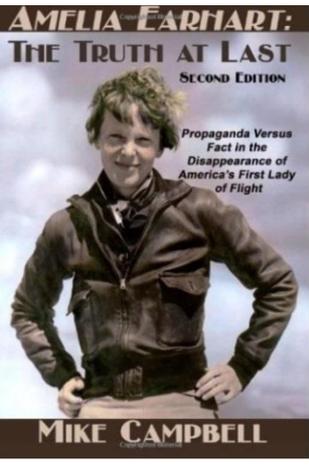
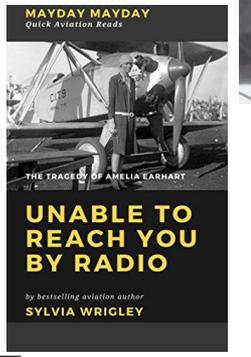
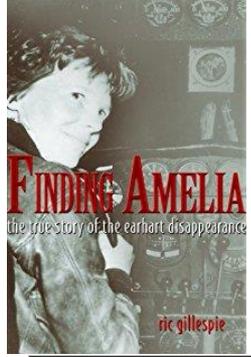
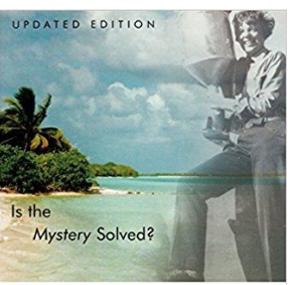
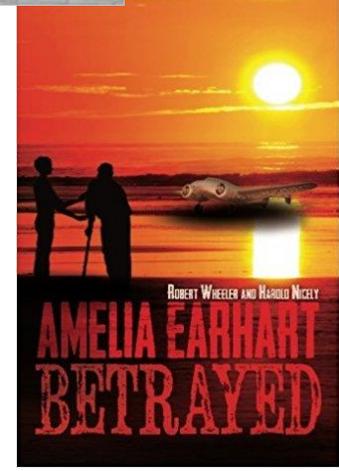
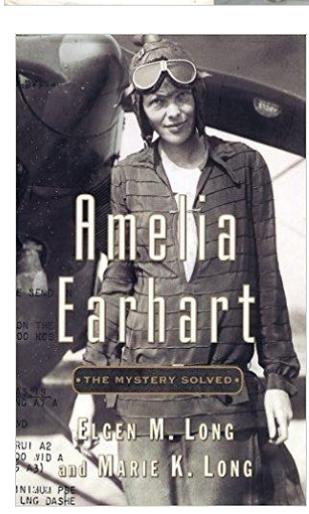
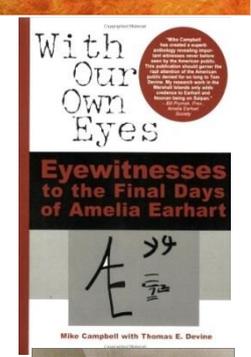
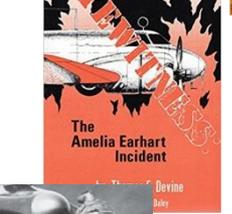
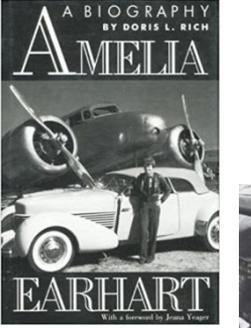
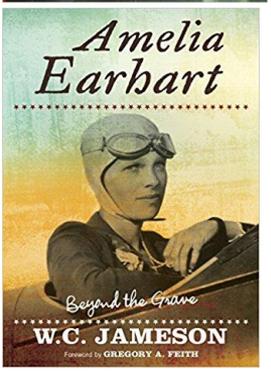
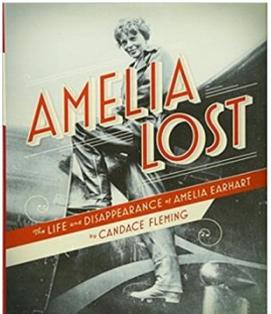
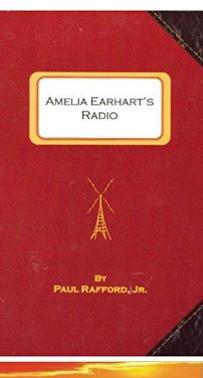
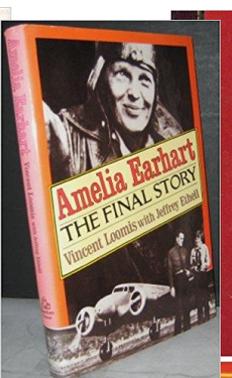
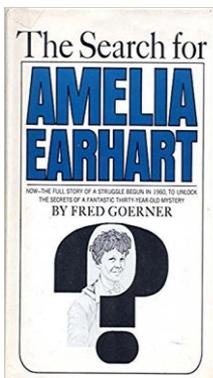
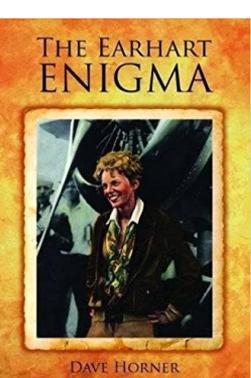
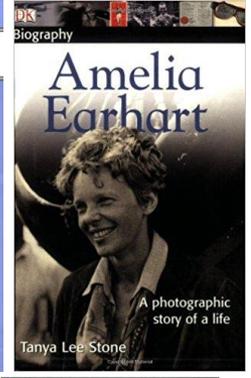


USS Colorado

Theories re the Disappearance



Lots of theories!



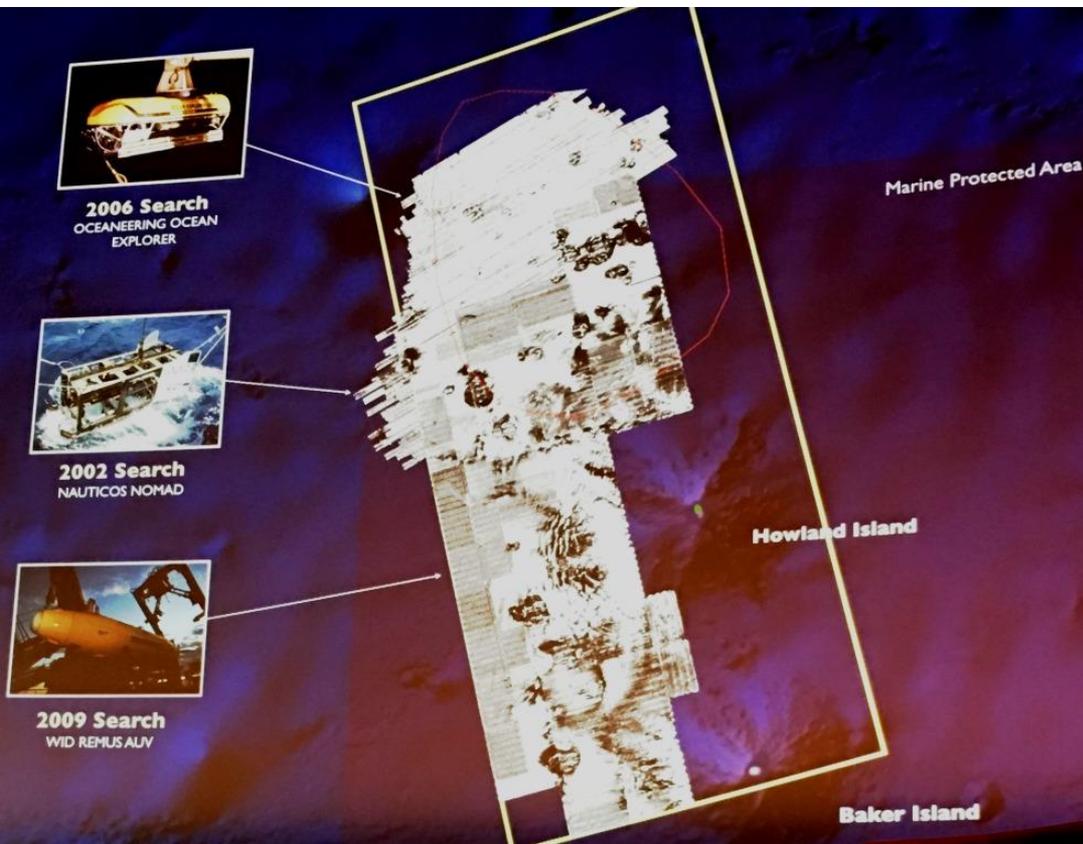
Crashed at Sea?

- 1989: mapping search by Longs N+W of Howland
- 1994: Timmer/Williamson attempt
- 1999: search by Timmer 45 days w/ side scan NW of Howland
- 2002: Kammerer attempt; Elgin Long 27 day search
- 2006: Nauticos/Waite search 687 sq. mi. NW of Howland
- 2009: Nauticos/Waite search 2000 sq. mi W of Howland
- 2017: Nauticos/Eustace search 960 sq. mi. N/S of Howland



© Kenny Polson
MarineTraffic.com

Mermaid Vigilance + AUV
used by Nauticos in early 2017



CT = 5500 sq. mi.,
total area searched
& mapped via sonar

Marshall Islands?



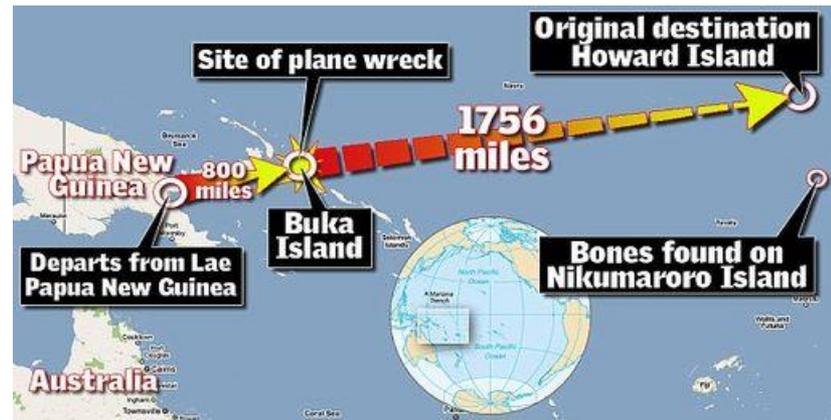
Objects found by Parker Hannifin Corp on Endrikin island Mili Atoll, RMI in 2015



“Flight to Freedom”
1943 movie



New Guinea?



Re-appeared
in NJ?

28 * THE EVENING NEWS
Newark, N.J., Tuesday, November 10, 1970

Claim N.J. Woman Is Amelia Earhart

NEW YORK (UPI)—Two former Air Force officers published a book yesterday claiming Amelia Earhart was captured 33 years ago by the Japanese on a spy mission survived eight years of captivity and may be living today under the name of Irene

yesterday, had "no comment" to the report she was a friend of Mrs. Bolam's.

The book was published by McGraw-Hill. Klaas is an account executive with ABC radio in San Francisco and Gervais is liaison officer for the Clark County, Nev., Sheriff's Office.



AMELIA EARHART



MRS. GUY BOLAM

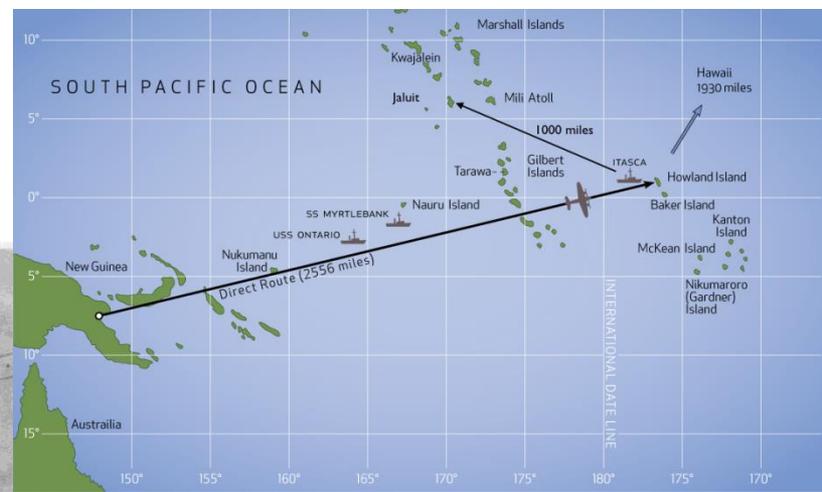
Tokyo Rose(s)?



Captured
by aliens?



History Channel claims this pic shows AE+FN + plane! **See them?**



PL-MARSHALL ISLANDS, JALUIT ATOLL, JALUIT ISLAND. ONI #14381
JALUIT HARBOR.

Me neither!

**Japanese blogger found this pic in 30 minutes on-line
– from 5 Oct 1935 – 2 yrs before the crash!**

ヤルット島ジャゴールの港

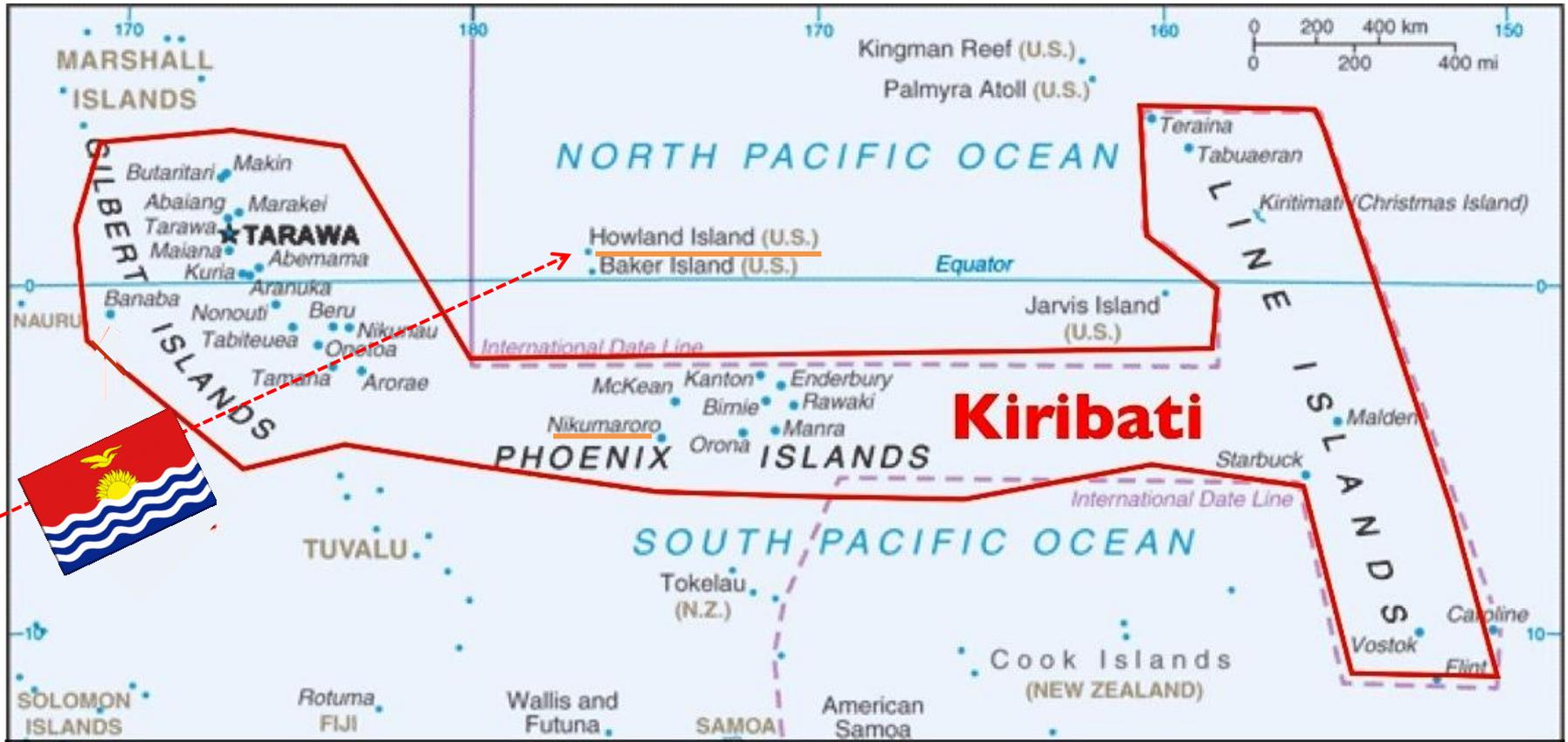


ジャゴールの港は海に見る良港である。月一河内地からの大船がゆ
らしい数々の物資に船積をふくらまして入港すると、マーシャル群
島の各地から、大酋長のスクーター、小酋長のボートが従ふてジャ
ゴール港に到着して来る、そしてジャゴールを賑やかにする。

Expedition to Nikumaroro



Kiribati (“keer e bas”) is both huge and tiny



Seattle

2750 miles across



Boston

Land area size: 313 sq. mi.; only 5 x area of DC

Total area size: 1.35 million sq. mi.; 5 x area of Texas!

Population: only 115,000

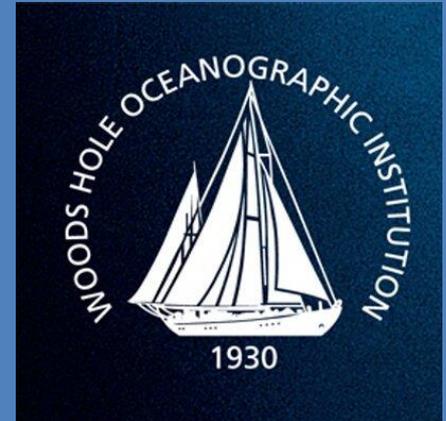
Our Expedition:



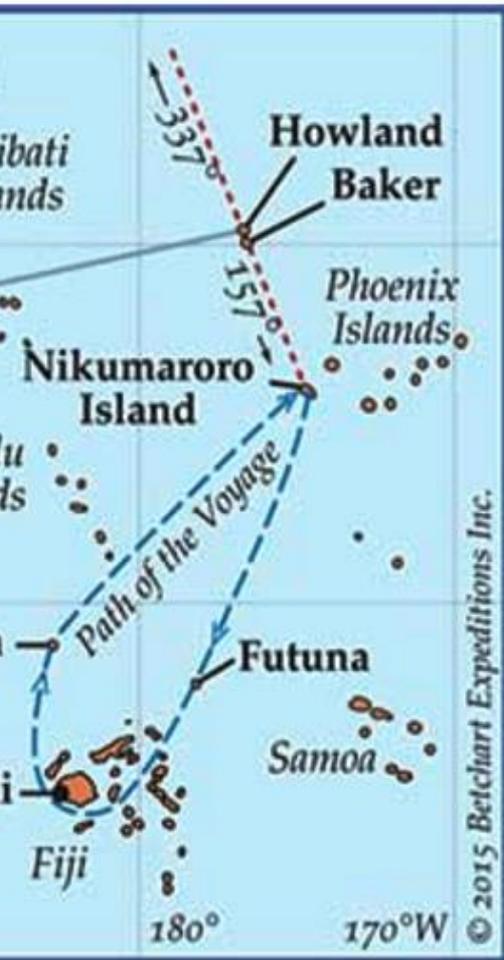
NATIONAL GEOGRAPHIC



The International Group for Historic Aircraft Recovery



Betchart Expeditions INC.



June 21--July 11, 2017

AMELIA EARHART EXPEDITION



TIGHAR NIKU IX 2017

Our effort attracted media attention

The New York Times

Amelia Earhart's Disappearance Still Captivates Searchers, 80 Years Later

USA TODAY

Bone-sniffing dogs will search for Amelia Earhart's remains on remote island



TIGHAR • 2366 Hickory Hill Road • Oxford, PA • 19363 • USA
610-467-1937 • tighar@tighar.org

NATIONAL GEOGRAPHIC

IN SEARCH OF AMELIA EARHART

Exclusive: Bone-Sniffing Dogs to Hunt for Amelia Earhart's Remains

In what may be the best chance yet to learn the famous aviator's fate, forensic dogs are headed to a Pacific island to search for her bones.

< 14 / 16 >



Ten-year-old Marcy and her handler, Miranda Townzen, help law enforcement agencies investigate crime scenes and cold cases.

PHOTOGRAPH COURTESY LYNNE ANGELO

Sniffer dogs on mission to find bones of Amelia Earhart

THE TIMES



A good ship and a great crew



First sight of Niku



Getting ashore and around



A beautiful island



In 7 days on the island I was lucky to work most of the major **sites**



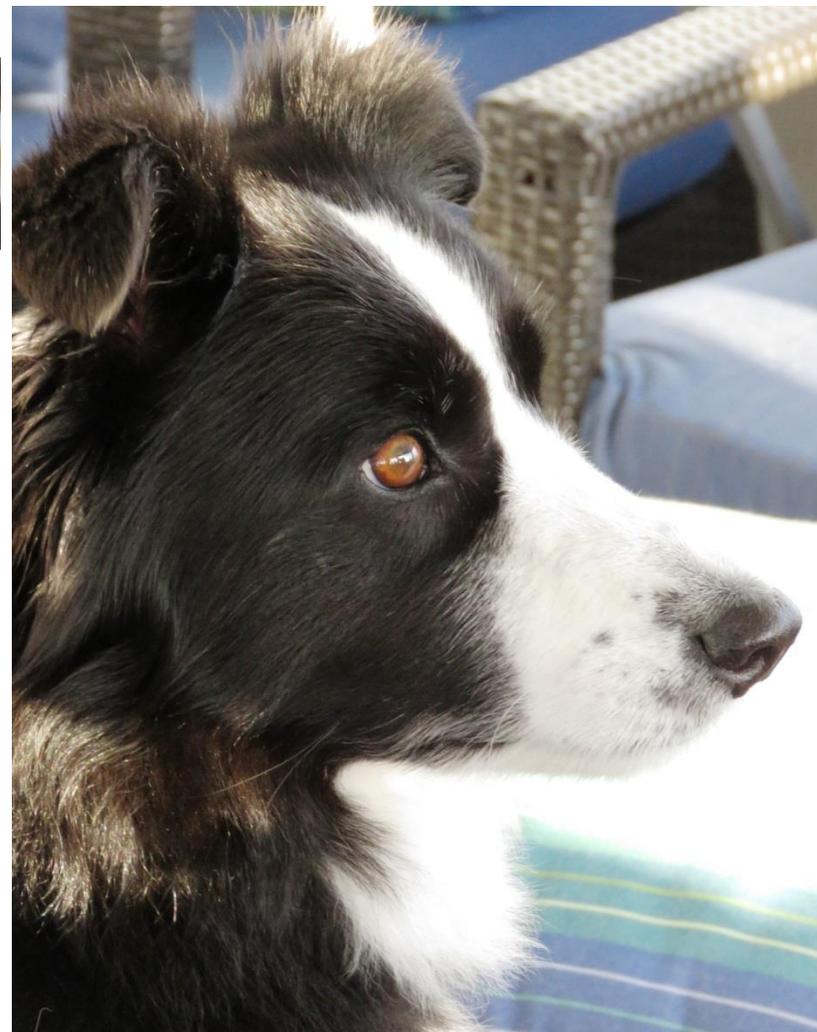
Humans worked hard...



...and were great companions...



...but the dogs were the stars!



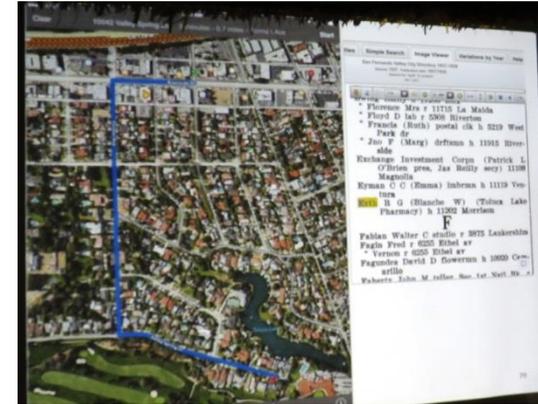
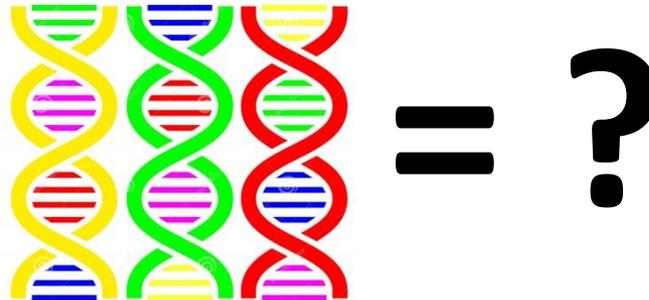
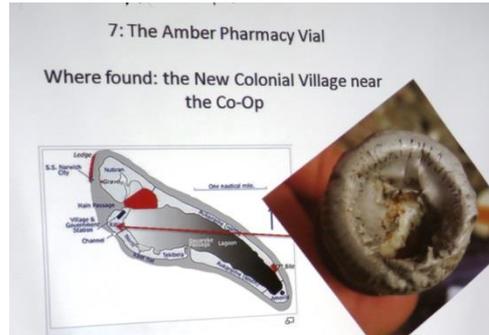
Our 2017 effort found:



Dogs confirmed human residue at the Ren Tree, as forecast by TIGHAR



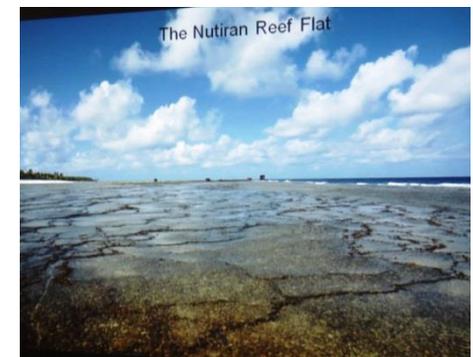
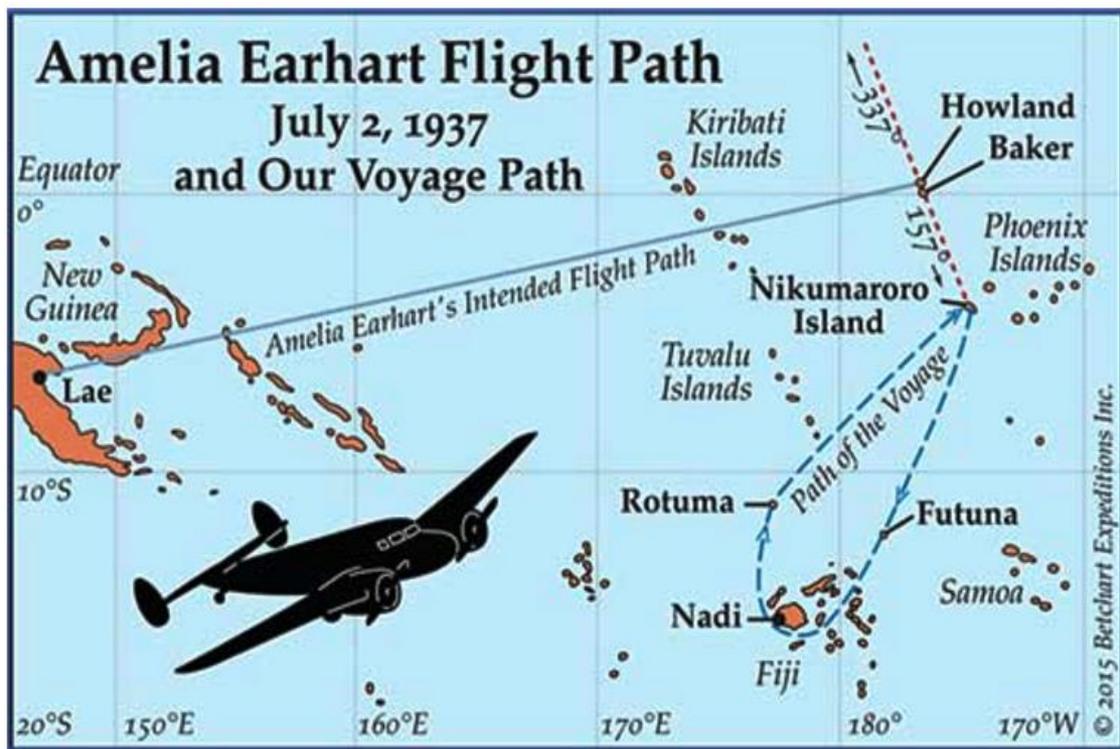
Soil, coral and tree material collected for DNA analysis – Keep fingers crossed!



Evidence for Nikumaroro



The TIGHAR theory: complicated, but feasible



13 bones found...



1.	Orbital width	38.5mm
2.	Orbital height	33.5mm
$\text{Orbital index} = \frac{OA \times 100}{ow} = \frac{3350}{38.5} = 87.0$		
This indicates a European - (Polynesians are about 84.0)		
Skull		
3.	Length	182 mm
4.	Breadth	137 mm
$\text{Cephalic index} = \frac{B \times 100}{L} = \frac{13700}{182} = 75.3$		
This indicates also a European.		
<u>Karl Pearson's formula for stature</u>		
5.	$S = 70.641 + 2.894 \times H$ Numerus is 32.4	$\therefore \text{height is } 163.406 \text{ cm}$ $= 5 \text{ ft } 4.3 \text{ in.}$
6.	$S = 78.664 + 2.376 \times T$ Tba. = 37.2	$\therefore \text{height is } 167.051 \text{ cm}$ $= 5 \text{ ft } 5.7 \text{ in.}$
7.	$S = 84.925 + 3.371 \times R$ Radius = 24.5	$\therefore \text{height is } 170.044 \text{ cm}$ $= 5 \text{ ft } 6.5 \text{ in.}$
Average of these three measurements is <u>5 ft. 5.5 inches.</u>		
<i>J. W. Hooper</i> 14 April 1941		



“Body had obviously been lying under a ‘ren’ tree and remains of fire, turtle and dead birds appear to indicate life. All small bones have been removed by giant coconut crabs which have also damaged larger ones.”

1940 official British report

...consistent with AE

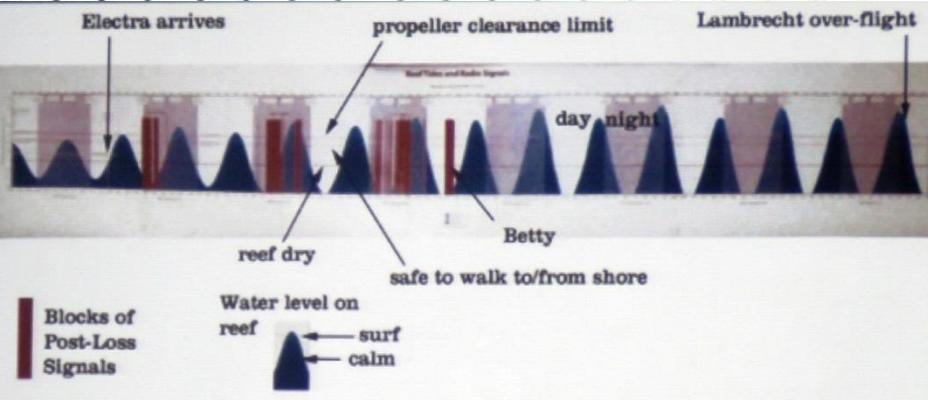
Evidence at the “Seven Site” on Niku



1. Freckle crème jar, US; AE used such crème
2. 1930s era women’s compact
3. Pocket knife, US, broken apart
4. Human bone found by TIGHAR
5. Human bones found in 1940
6. 1400 fish bones & uneaten fish heads
7. Melted glass bottles and 11 fire features
8. Clam shells for catching water
9. US-made zipper
10. Glass shards used as knives
11. Forensic dog alerts
12. Sextant box w/ # close to Noonan



Faint Signals Heard From Amelia's Plane



Amelia Earhart: The Lost Evidence

NPG 1304

NAVAL MESSAGE

RECEIVED AT NAVY DEPARTMENT
F5L MUSK V NPM Z NRUI V QUAX P GR 44.

FROM: COMDR HAWIAN SECTION CG
ACTION: ITASCA C G
KXKX

PRIORITY
037 JUL 5 12 40

PASSED TO OPNAV & CINCUS KBR BY RDO HONOLULU FOR APPROPRIATE ACTION

U.S. GOVERNMENT PRINTING OFFICE 4-7143

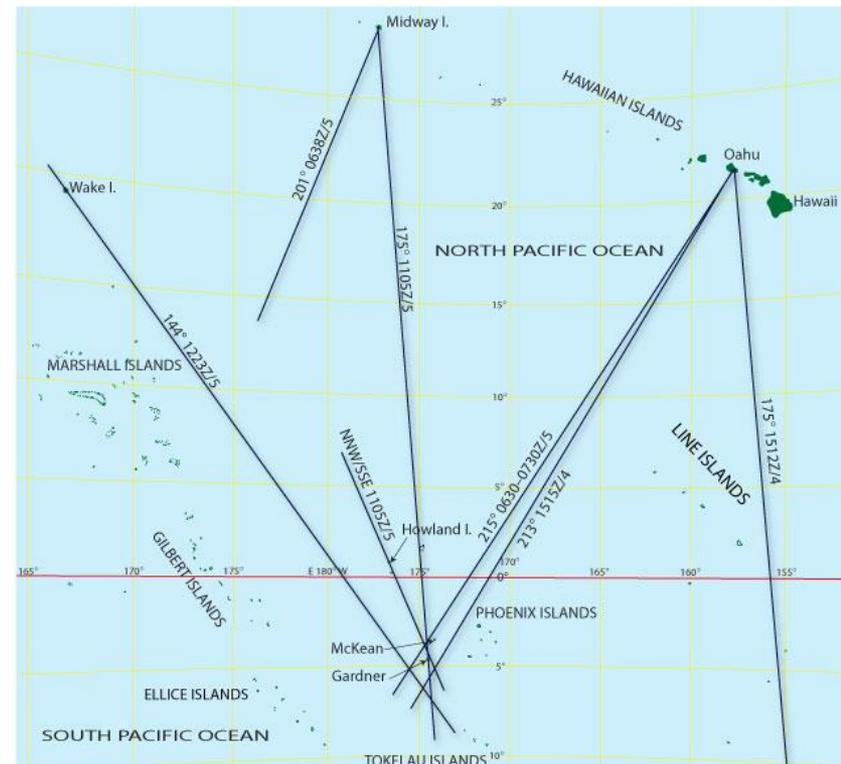
PRIORIT Y /KD

8005 FOLLOWING COPIED NAVY RADIO WAILUPE 1130 TO 1230 GCT
QUOTE 281 NORTH HOWLAND CALL KHAQQ BEYOND NORTH MONT HOLD
WITH US MUCH LONGER ABOVE WATER SHUT OFF UNQUOTE KEVED
TRANSMISSION EXTREMELY POOR KEYING BEHIND CARRIER FRAGMENTARY
PHRASES BUT COPIED BY THREE OPERATORS 0242

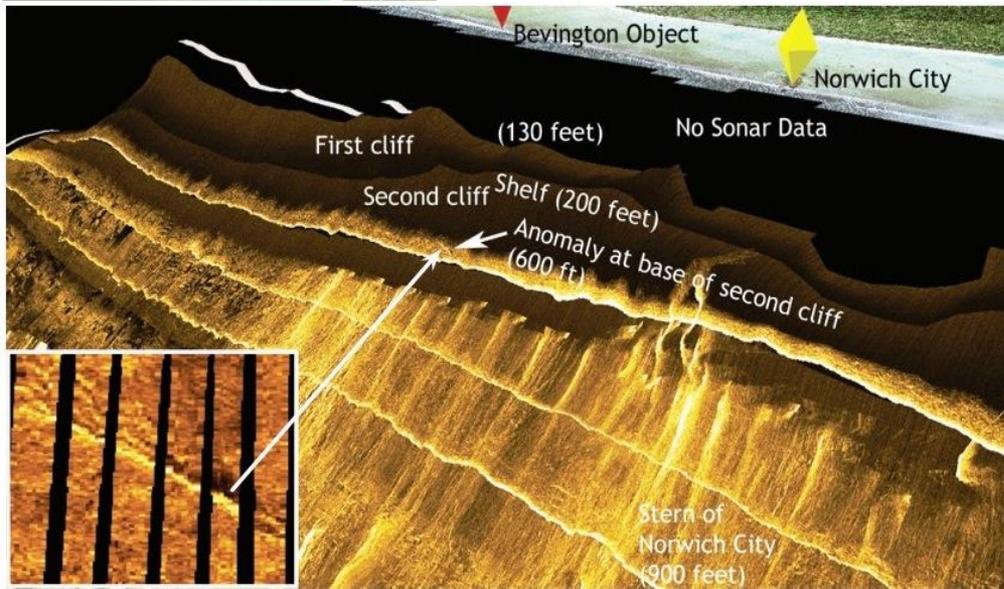
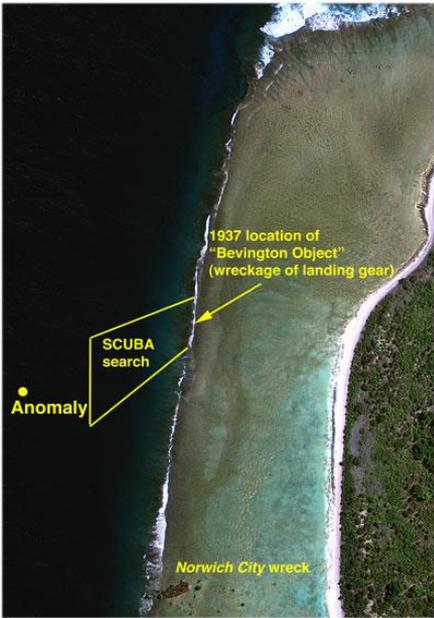
▶ ⏪ ⏩ 49:03 / 1:23:59

Post-Loss Radio Signals: A Selection

July:	GM Time	Signal	Received at
3	0200	Weak signals, "L-A-T"...	L.A.
3	0400	Weak signs, "erratic, undeciph."	L.A.
3	0517	Carrier wave	Honolulu
3	0530	"Hear her now, weak..."	Itasca
3	0600	(Itasca requests dashes)	
3	0600	Itasca request, responding dashes	HMS Achilles
3	0604-06	"Something like generator start"	Itasca
3	0607	Unreadable, "Earhart" mentioned	Itasca
3	0700	Weak, unreadable	L.A.
3	0800-45	Earhart voice, SOS loud & clear	Amarillo
3	0831-54	Unintel. voice, "like last night"	Nauru

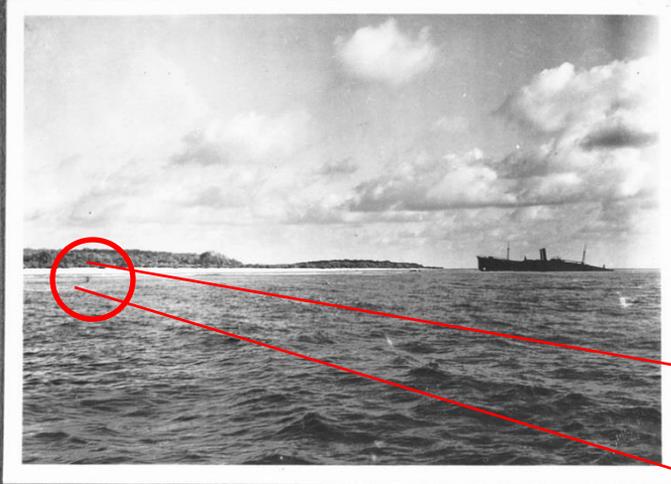


Limited searches done underwater at Niku...

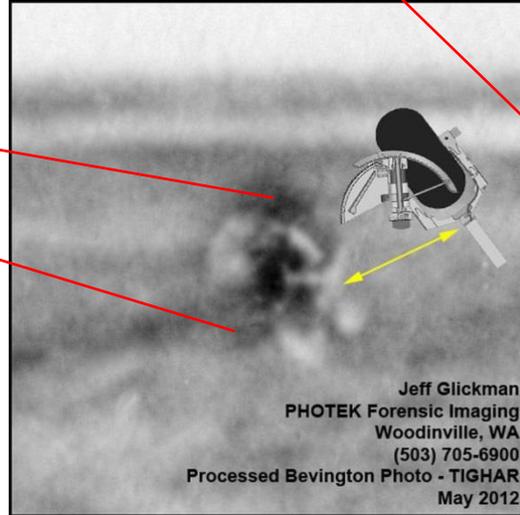
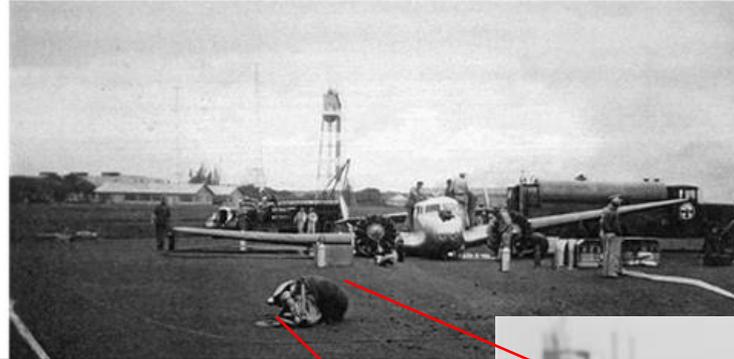


...no success so far

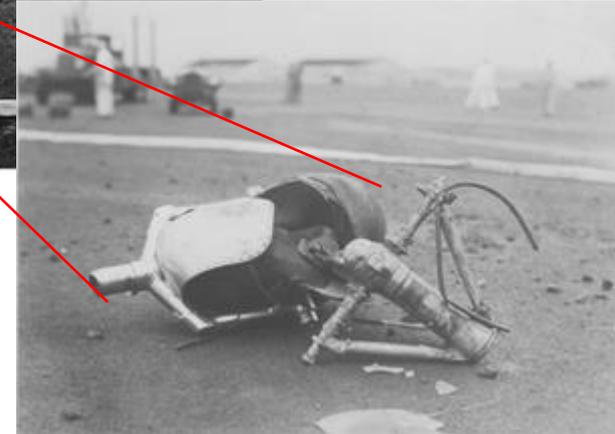
But perhaps bits of the plane were spotted at Niku in a photo...



Gardiner Is. and the wreck



Jeff Glickman
PHOTEK Forensic Imaging
Woodinville, WA
(503) 705-6900
Processed Bevington Photo - TIGHAR
May 2012



...and by an eyewitness:



Emily Sikuli

Conclusions



So, where are they?



My estimate:

- 30% chance they crashed at sea near Howland, probably S not N
- 9% chance Marshall islands
- >1% other conspiracy theories
- **60% landed & died on Niku**



Last photo of AE/FN



**IMHO Niku proven to
“a preponderance of the evidence”–
but not “beyond a reasonable doubt”**



**THANKS!!!
QUESTIONS?**

