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1940  
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 ,1973; 1979; 1980a; b; Hayama, 1988 1973  
 Kobayashi et al., 2014 1998  
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 600 Kobayashi et al., 2014  
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*Phoca vitulina*

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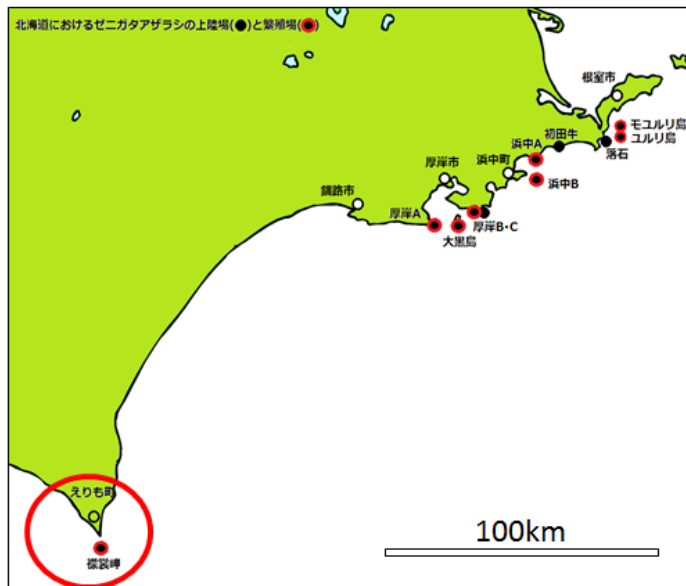
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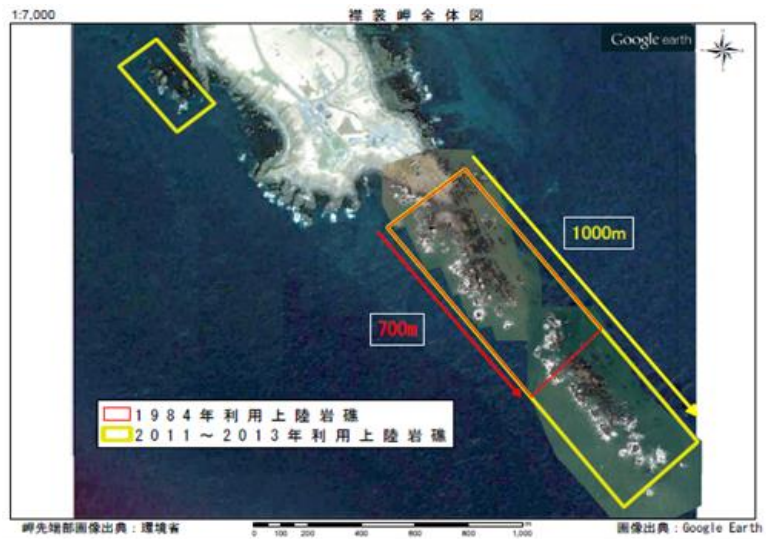
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2011

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( ,1986,Wada et al.,1992 ) 2014





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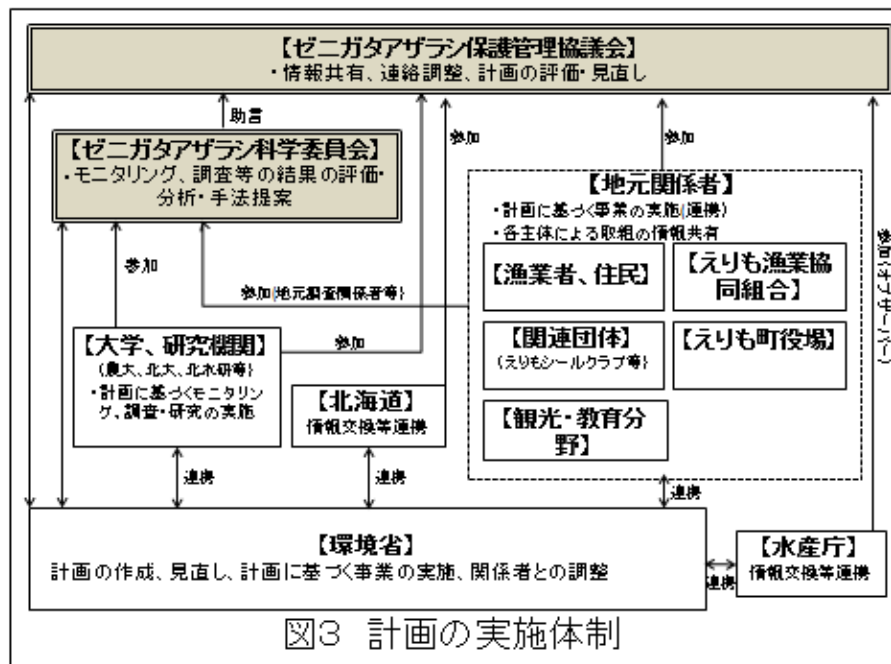
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< Hayama, S. 1988 Kuril seal - Present Status in Japan -. AMBIO A Journal of the Human Environment 17 75-78.

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< -42, 10(11): 41-46

< . 1986. , pp 18-58.

< Kbayashi Y, Kariya T, Chishima J, Fujii K, Wada K, Baba S, Itoo T, Nakaoka T, Kawashima M, Saito S, Aoki N, Hayama S I, Osa Y, Osada H, Niizuma A, Suzuki M, Uekane Y, Hayashi K, Kobayashi M, Ohtaishi N. and Sakurai Y. 2014. Population trends of the Kuril harbour seal *Phoca*

*vitulina stejnegeri* from 1974 to 2010 in southeastern Hokkaido, Japan  
Endangered Species Research 24(1): 6-172.

- < .1986.  
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- < Wada, K., Hamanaka, T., Nakaoka, T. and Tanahashi, K. 1992. Food and feeding habits of Kuril and Larga seals in southeastern Hokkaido. Mammalia 56: 55-66

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*Phoca vitulina*  
 (1998)  
 (2012)  
 2015  
 IUCN  
 Least Concern  
 5

B

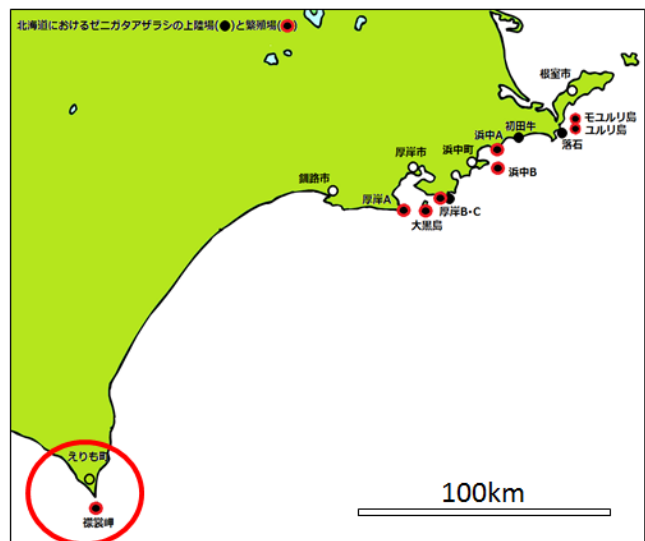


60 142kg  
 174 186cm

160 169cm

87 170kg

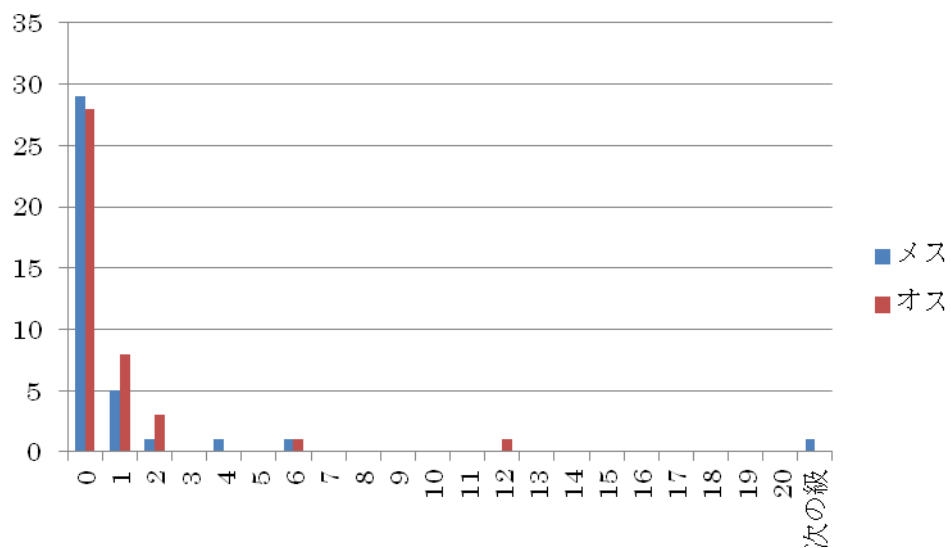
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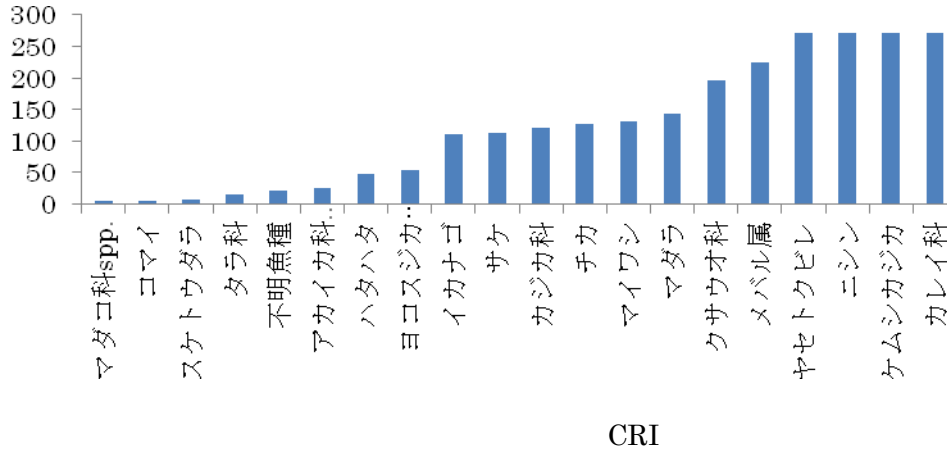
79

79                      0                      72.2                      1                      16.5                      5.1  
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79					68				
	FO%				I	CRI			
		12	17			2	4		
(33.8%)			(27.9%)			(25.0%)		(22.1%)	spp
spp (19.1%)			(17.6%)			(11.8%)		(10.3%)	
(8.8%)			(7.4%)			(7.4%)		(5.9%)	
(5.9%)		(2.9%)				(2.9%)		(2.9%)	

(1.5%) (1.5%) (1.5%) (1.5%)  
 (12.0%) (10.4%) I% spp (8.4%) (47.8%)  
 (6.6%) CRI spp spp  
 2



CRI

7

71.0kg± 28.7  
 38.6kg± 11.2  
 (Welch Two Sample t-test p<0.05)

1 7 2 3 6 1 12 1 37 0 25  
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 52  
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1980

Kobayashi,



23 24 26

24 26

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	1	3		3	4	11	
26		3	5		2	3	13

	8	10		50		
				8	11	

	21	9				15
21					21	9
						10

30m Harbor seal

				26
	8	12	20	
	20			

	2	40kg		40kg
	GAMM			40kg
40kg			p<0.05	40kg
			Wright	(2007)

				Frost	(2001)		Fujii	(2006)						
40kg														
						23								
									2011	6	19	6	21	
		6	7	2	3		1			7				
1	2011	8	29	9	2									
			13											4
							3				2			
					1		2		13		9			
						38mm	135mm		165mm					900g
			3				8							
							FT-817ND				1,100mm			
1,000mm		4							2011	6	28		2011	
11	18						6	00	18	00	1			
														2012
		300												0.64±
0.17	SD						Harbor seal							Harvey and
Goley,	2010						0.61	0.65						
						Kobayashi,								
														0.64

Wright, B. E., S. D. Riemer, R. F. Brown, A. M. Ougzin and K. A. Bucklin. 2007. Assessment of harbor seal predation on adult salmonids in a Pacific Northwest estuary. *Ecological Applications* 17:338-351.

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26 )

25		10	1		11	1	26
	8	1		8	11	3	

3

100 2

4 A B C D

4

4

A B C D

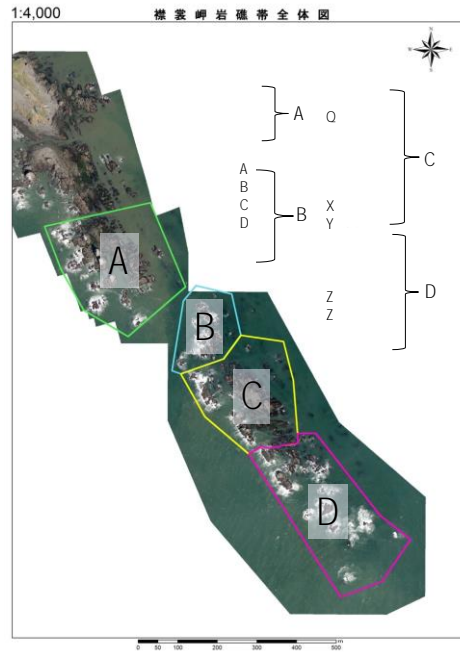
A	28.37	B	11.97	15.76	C(15.31	28.98	D	16.39
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18.51

4 A B C D

22.05 ± 3.34

77.9 0.78



1

UAV

QGIS

3

2014

10

9

2014

11 9 2

10 9

X C

(a)

C

b

C c Y C

d " C D

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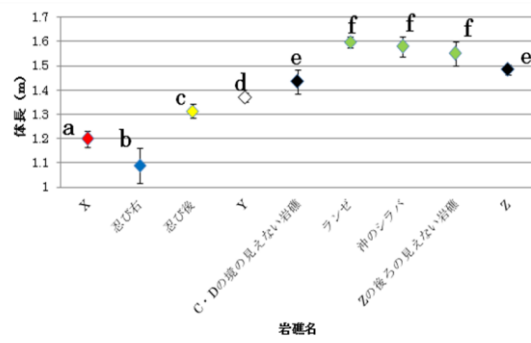
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C

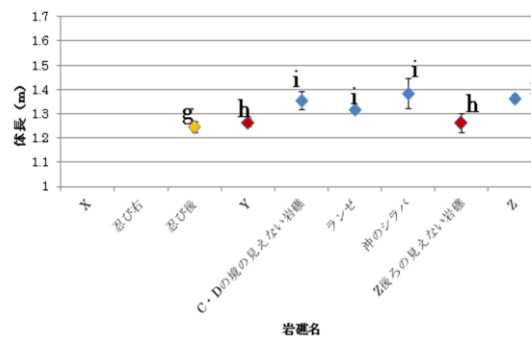
D

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9



10月9日の体長組成



11月9日の体長組成

2

各岩礁ごとの体長平均の比較

100

10

100

) 1974 2013  
1998 2013

(

2

CV, 0.076

CV 0.05

CV 0.2

0.231 &

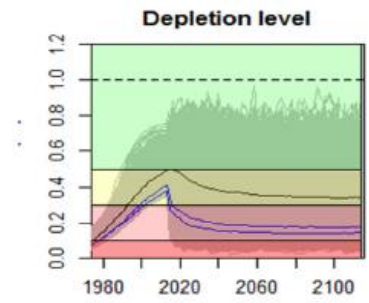
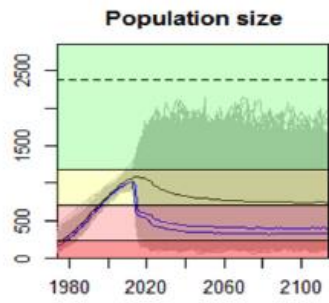
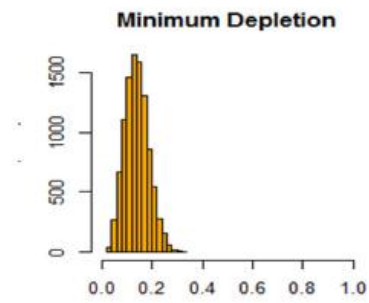
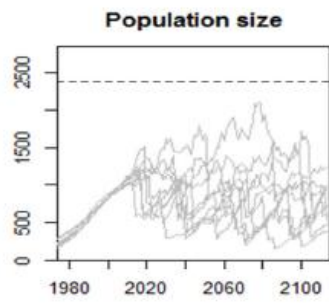
2002 1~66 1998 1~50%

20 20 50 30

(CV=0.05) 100 5 50

100 5





10

5%,10%

10000  
( )

(CV=0.2)

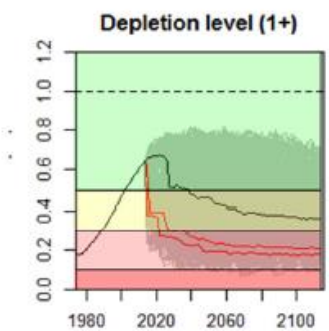
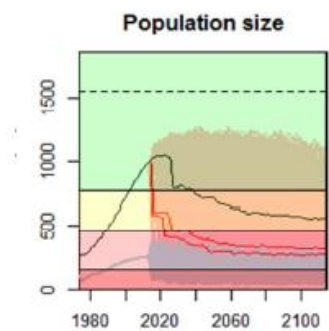
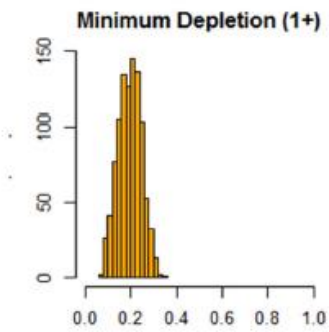
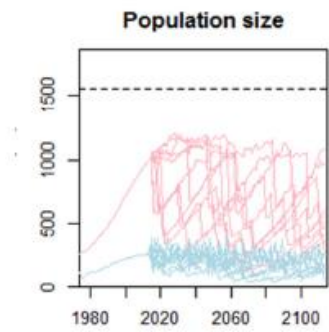
100

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50

2010 2014 5

1000

5

$P_A$   $P_J$

$m$

$s$

$P_A$   $P_J$   $P_A$

$P_J$   $\alpha$   $\alpha$  1.5  $\alpha$  1 1 1.25 1.5 3

1

	, 2012	, 2013	, 2014	, 2015	, 2015
					$X$
2014	451		225		676
2013	492		238		730
2012	539		254		793
2011	391		250		641
2010	592		263		855

$s$

0.78 1983 2010 28

Kobayashi et.al 2014

69.35±5.78 ±SD

$f$   $N_A$   $f$   $X$   
 $P_A$   $+$   $+$   
 $fP_A N_A$   $m$   $+$   $sfP_A N_A$   
 $sfP_A N_A / m$   $X$   $s$   
 $X$   $N_A$   $m$   $P_A$   
 $N_A$   $mX$   $sfP_A$

UAV  
, 2015 1.5m , 2014 , 1986  
2014 10 9 351  
1.5m 264 67.5% 2014 11  
9 338 1.5m  
107 31.7%  $m$

2015  
2014 10  
 $m$  0.675  $N_A$   
 $+$   $X$   
 $mX/s$   $fP_A N_A$   $P_A N_A$   $f$   $P_A N_A$  2  
 $P_A N_A$   $\pm 2SD$

	2	+	X	+
		$mX/s$	$fP_A N_A$	$P_A N_A$
		+	X	$P_A N_A$
			$mX/s$	$fP_A N_A$
2014	676		585.0	843.5 (723.0-1512.3)
2013	730		631.7	910.9 (783.8-1193.1)
2012	793		686.3	989.5 (848.2-1187.5)
2011	641		554.7	799.9 (685.6-959.9)
2010	855		739.9	1066.9 (914.5-1281.3)

$P_J$

0.64 , 2012

A J  $\alpha$   $P_A =$

$P_J$   $P_A$  1  $P_J = 0.64$

$\alpha < 1.5$  1 1.25 1.5

0.64

0.61 0.65 Harvey and Goley 2011 1

1000

2010 2014 5 1000

$\alpha$	1	1.25	1.5
$P_A$	64%	80%	96%
2014	1318.0 (1129.7-1581.7)	1054.4 (933.8-1265.4)	878.7 (753.2-1054.5)
2013	1423.3 (1223.-1708.)	1138.7 (976.-1366.4)	948.9 (813.3-1138.7)
2012	1546.2 (1325.3-1855.5)	1236.9 (1362.2-1484.4)	1030.8 (883.5-1237.)
2011	1249.8 (1071.2-1499.8)	999.8 (857.-1199.8)	833.2 (714.2-999.9)
2010	1667.0 (1428.9-2508.5)	1333.6 (1143.1-1641.4)	1111.4 (952.6-1333.7)

2012 (*Phoca*  
*vitulina stejnegeri*)  
 51pp

Harvey JT, Goley D. 2011. Determining a correction factor for aerial surveys of harbor seals in California. *Marine Mammal Science* 27:719-735  
 2015

2014 63pp  
 2015 26  
 ,92pp

Kobayashi, Y., Kariya, T., Chishima, J., Fujii, K., Wada, K., Ito, T., Ishikawa, S., Nakaoka, T., Kawashima, M., Watanabe Y., Saito, S., Aoki, N., Hayama, S., Osa, Y., Osada, H., Niizuma, A., Suzuki, M., Syukunobe, T., Uekane, Y., Hayashi, K., Kobayashi, M., Ohtaishi N. and Y. Sakurai. 2014. Population trends and distribution of the Kuril harbor seal *Phoca vitulina stejnegeri* in 1974-2009 in southeastern Hokkaido, Japan. *Endangered Species Research*. 24: 61-72.  
 2015

2014 70pp  
 2014 (*Phoca vitulina stejnegeri*)  
 2013 76pp

2015  
1986.  
2013  
2014

53pp

2012

48pp

2014  
pp179-194.  
418pp

58pp

2013





	2011	2012	2013	2014
	29,986	53,430	79,980	117,09
	28,601	38,841	39,682	63,48

)

(

(Brown & Mate,1983, 1986, Olsen et al.,1995, Andrsen et al., 2004, Luxa & Acevedo-Gutierrez, 2013, Bromaghin et al., 2013,Geiger et al., 2013)

Harkonen, 1987, Olsen et al.,1995, Hauksson & Bogason, 1997, Hall et al., 1998, Brown et al.,1998, Hammill & Stenson,2000, Hammill et al., 2010

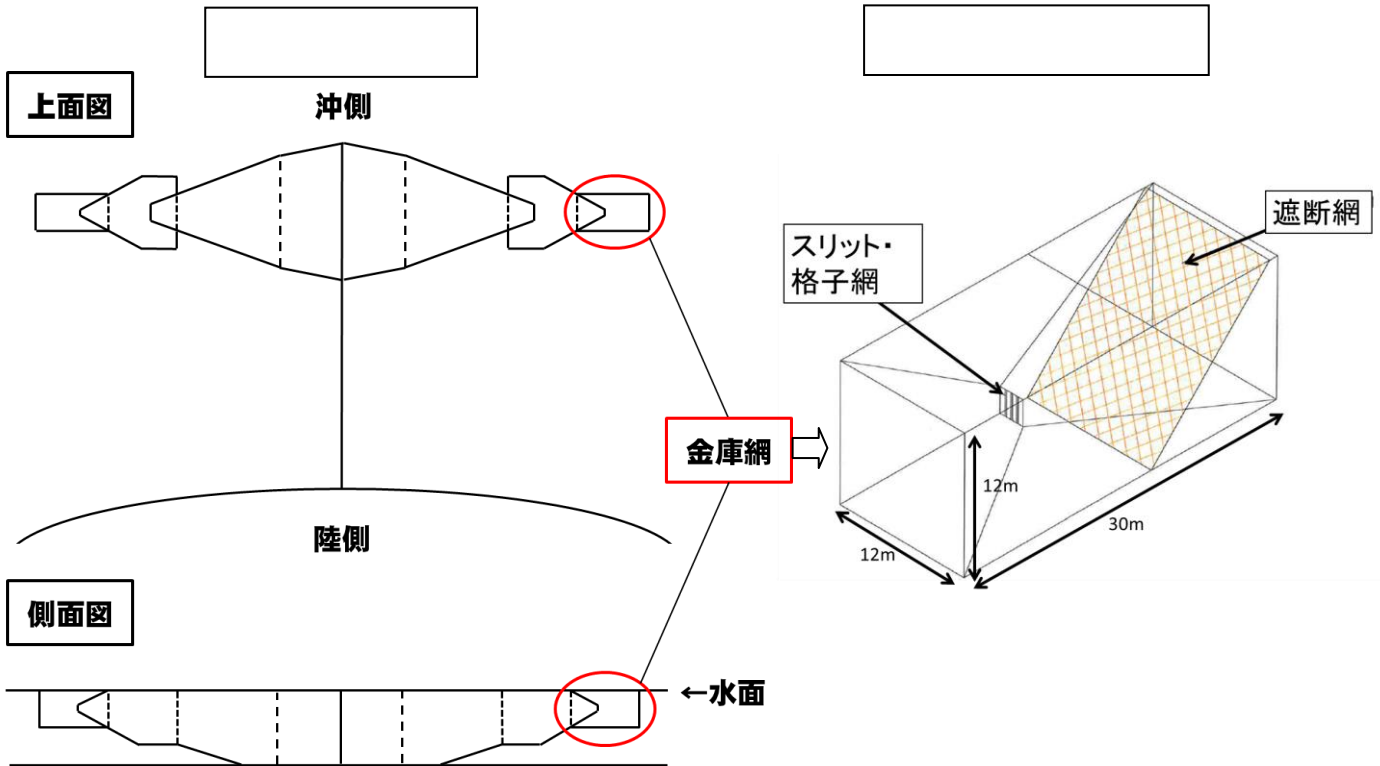
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26 H25 H27  
27 27

40cm 27 20× 40cm 20× 20cm 26 40× 70cm 40×



26

27



37

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