Socio Economic Impact of Resources Extraction

- Generally overview of PI fisheries (oceanic/coastal/deep slope)
- Socio – Economics impact (fisheries)
- Environment (fisheries/mining)

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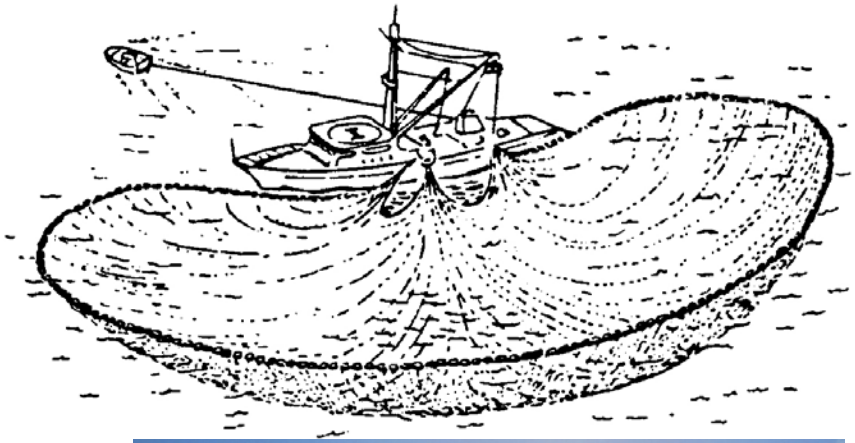
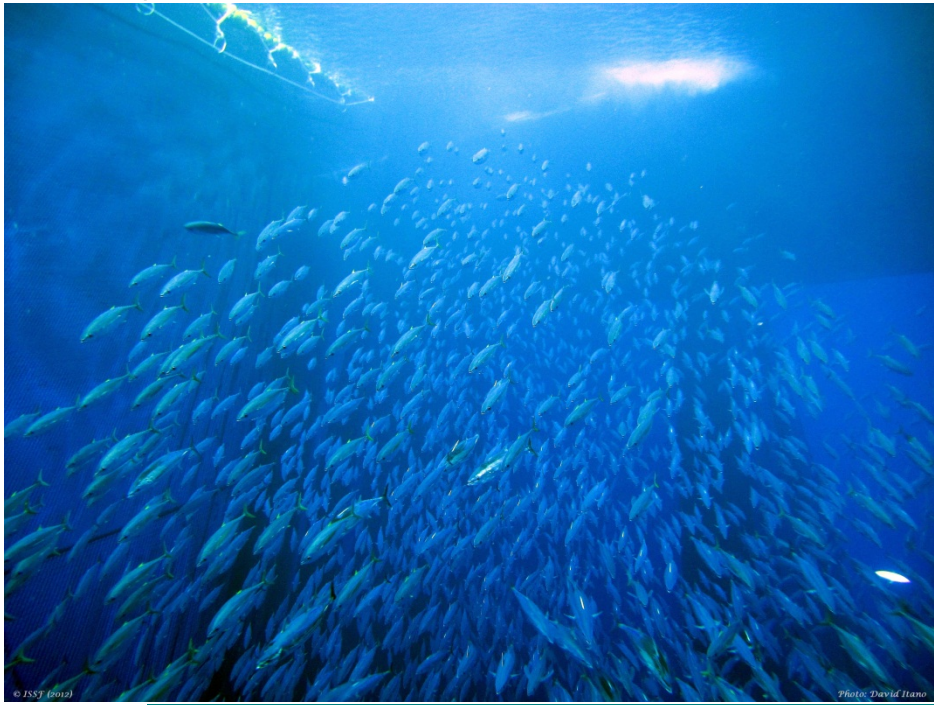
Purse Seine



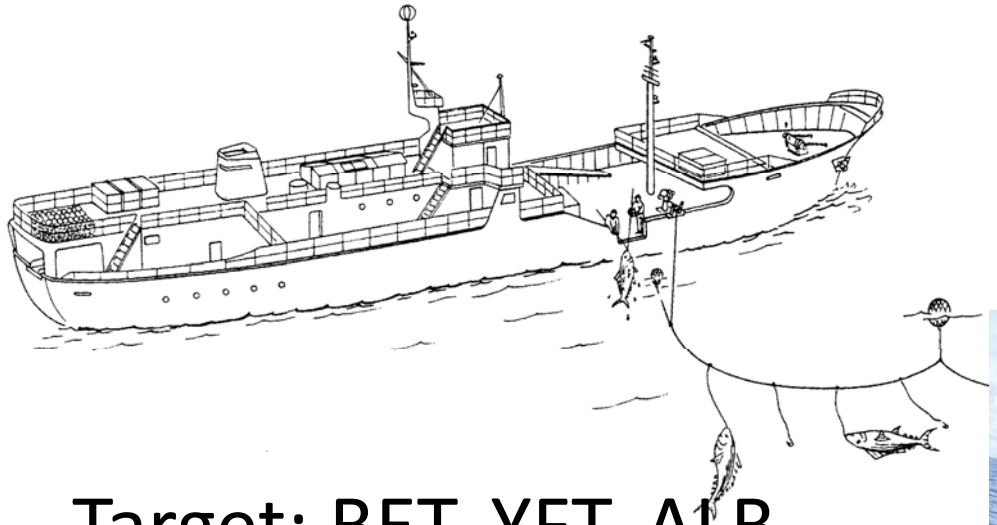
Top 100 m

Target schooling fish:

SKJ/YFT



Long Line

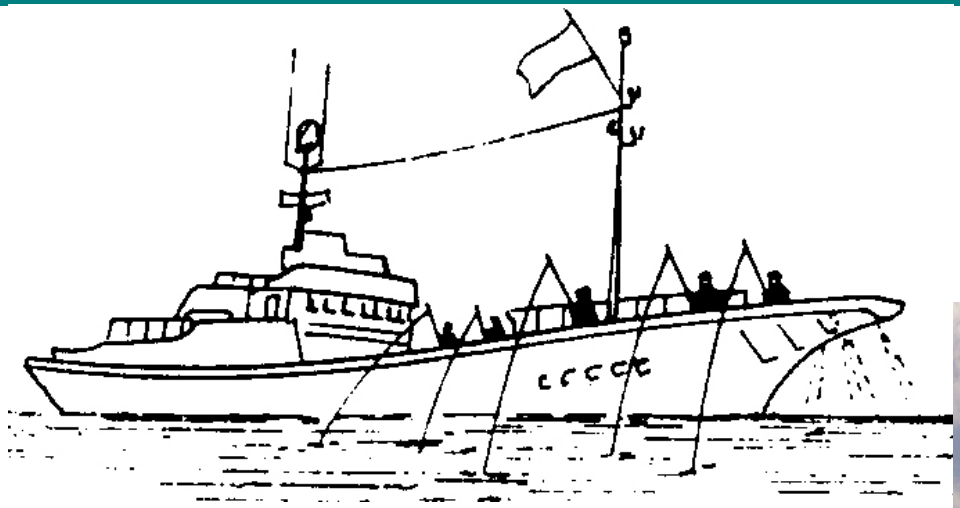


Target: BET, YFT, ALB, Bill Fish

Hooks: 1,200-3,000

Depth: >100 to 400m

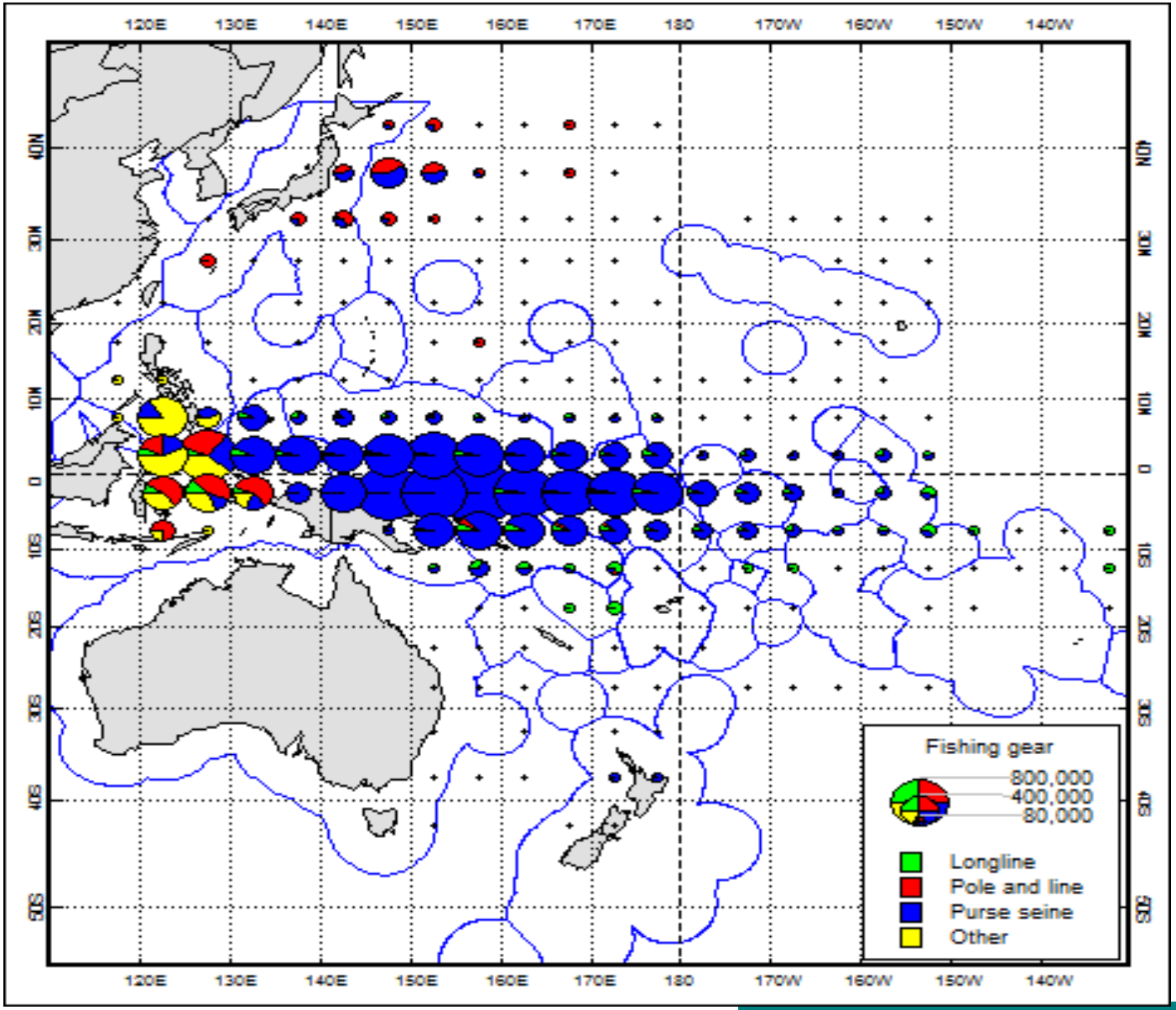
Pole and Line



Target schooling fish
(SKJ/YFT)

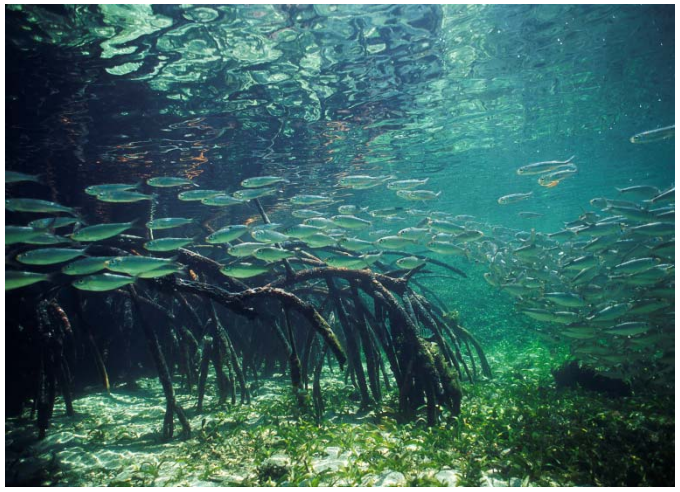
No Commercial Deep Sea Trawl Fisheries in Tropical Pacific Belt

Distribution of tuna catch across Pacific



Coastal fisheries: coral reefs, mangroves and sea-grass habitats provide the bulk of subsistence animal protein

Export coastal fisheries: Sea Cucumber; Aquarium fish; MoP.



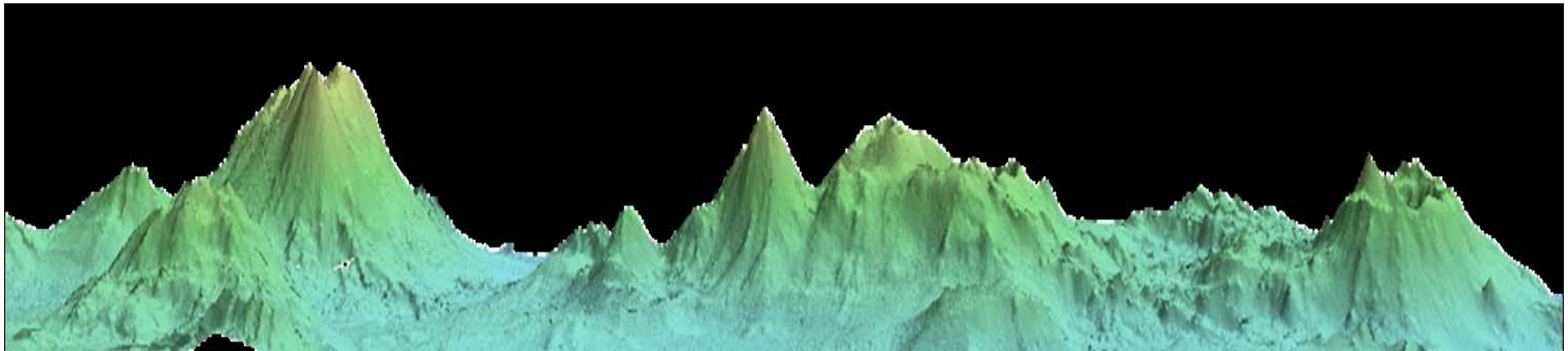
Coastal Fisheries

- Wide range of reef fish and shellfish species
- Depth typically < 50 m
- Supports a combination of subsistence fishing, and local market commercial operations
- Subsistence fishing provides up to 90% of protein intake of some coastal communities
- Very important for local incomes

* Many coastal habitats/resources are under pressure from fishing, land based activities and climate

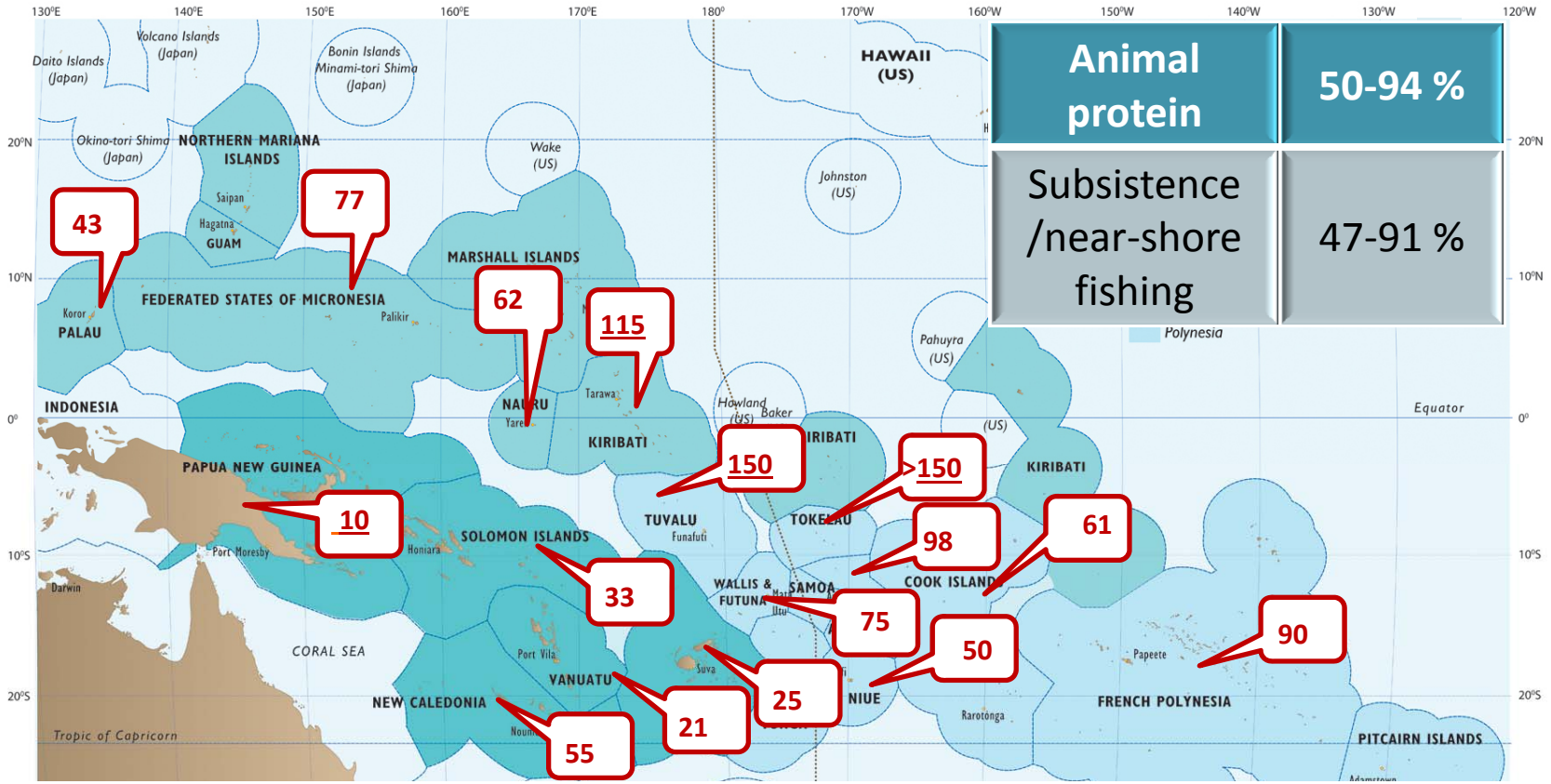
Sea Slope, Sea Mounts Fisheries

- Elevated seafloor topography, Usually volcanic, commonly formed as “hotspots”
  -Deep water snapper fisheries, localised areas and general small (200-350m)
  -Alfonsino (around 600m depth @ higher latitudes; but not commercial at this time)



How much fish do we eat?

- Fish consumption in rural areas (kg/person/year)



Source: Bell et al. (2009), Gillett (2009)

Future fish needs

Regional plans

- Provide 35 kg of fish per person per year
- Maintain traditional fish consumption where it is >35 kg

POLICY BRIEF 1/2008 | Secretariat of the Pacific Community

Fish and Food Security

What is food security?

Food security means that all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and preferences for an active and healthy life (World Food Summit 1996).

The right to food security is central to human development and many of the major human rights treaties[1]. It is also implicit in Goal 1 of the Millennium Development Goals – eradicating extreme poverty and hunger.

Food security in the Pacific

Food security is under threat in the Pacific. Agricultural production is not keeping pace with population growth and two thirds of Pacific Island countries and territories (PICTs) are now net importers of food. Regrettably, the low nutritional quality of many of these imports has increased the incidence of obesity, diabetes and heart disease.

Importance of fish

Fish[2] is high in protein and rich in essential fatty acids, vitamins and minerals, such as iodine. The importance of fish in Pacific diets, particularly for children, is widely recognised.

SPC's Public Health Programme advises that up to 50 per cent of the daily protein intake recommended by WHO for good nutrition will need to come from fish for people in the Pacific. This means that, on average, each person in the region should eat about 35 kilograms of fish per year.

Fish consumption in many PICTs already exceeds these recommendations (see Table 1). Fish provides 50–90 per cent of animal protein intake in rural areas, and 40–80 per cent in many urban centres. Most of the fish eaten by rural people comes from subsistence fishing and per capita consumption in rural areas often exceeds 50 kilograms of fish per year.

[1] Including the Universal Declaration of Human Rights, the International Covenant on Economic, Social and Cultural Rights, and the Convention on the Rights of the Child.

[2] Fish is used here in the broad sense to include fish and invertebrates.

TABLE 1. Percentage dietary animal protein derived from fish, percentage of food fish caught by subsistence fishing, and current annual per capita fish consumption in the Pacific. (Information derived mainly from national household income and expenditure surveys between 2001 and 2006; other members of SPC – American Samoa, CNMI, Guam, Marshall Islands, Pitcairn Islands, Tokelau – are not included because comparable data were not available.)

PICT	Animal protein (%)		Subsistence catch (%)		Per capita fish consumption (kg)	
	Rural	Urban	Rural	Urban	Rural	Urban
Melanesia						
Fiji			52	7	25	15
New Caledonia			91	42	55	11
Papua New Guinea			64	n/a	10	28
Solomon Islands	94	83	73	13	31	45
Vanuatu	60	43	60	17	21	19
Micronesia						
FSM	80	83	77	73	77	67
Kiribati	89	80	79	46	58	67
Nauru*	71	71	66	66	56	56
Palau	59	47	60	35	43	28
Polynesia						
Cook Islands	51	27	76	27	61	25
French Polynesia	71	57	78	60	90	52
Niue*			56	56	79	79
Samoa			47	21	98	46
Tonga*			37	37	20	20
Tuvalu	77	41	86	56	147	69
Wallis & Futuna*			86	86	74	74

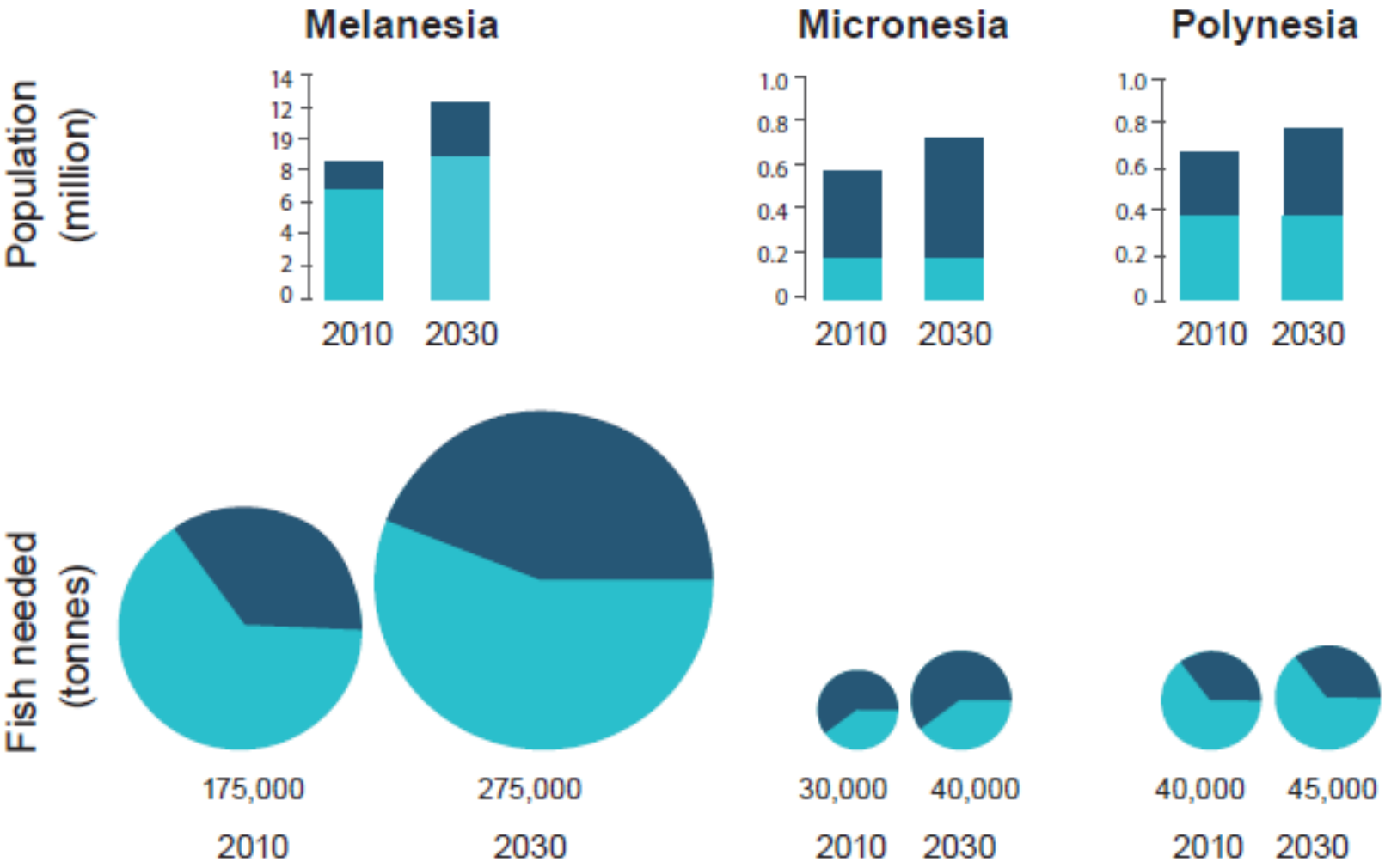
* Values are national averages (data not available for urban and rural areas).

Population growth PI Region

Year	Population (million)
2012	10
2030	15
2050	18
2100	27?

Source: SPC Statistics for Development Program

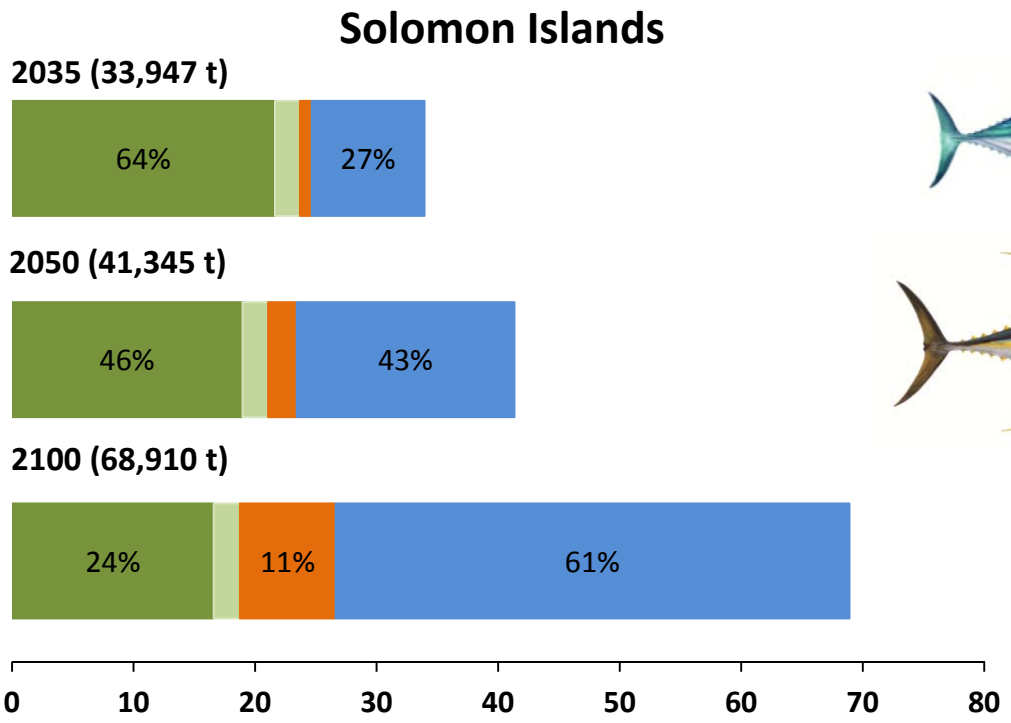
Future fish needs (to 2030)



Source: Bell et al. (2011)

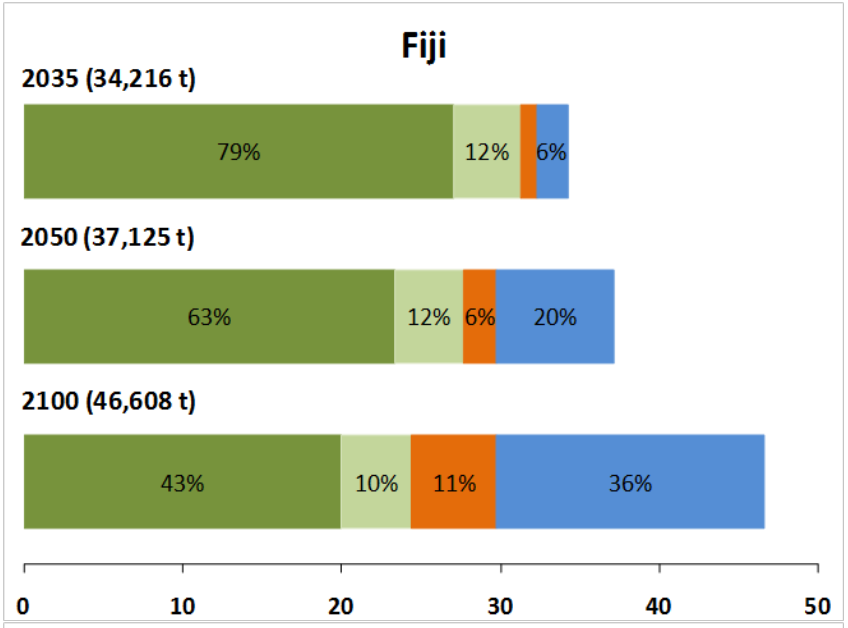
Where will the fish come from?

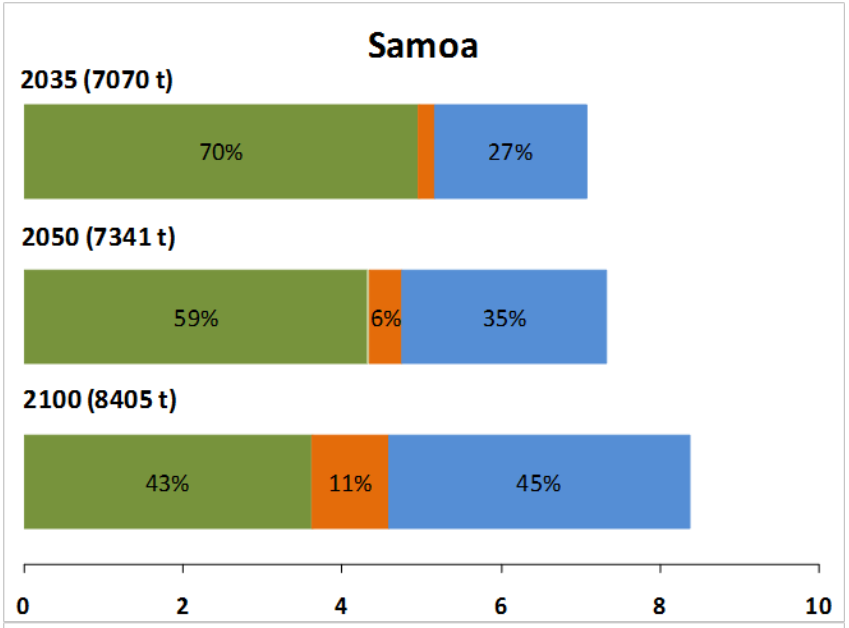
Tuna!

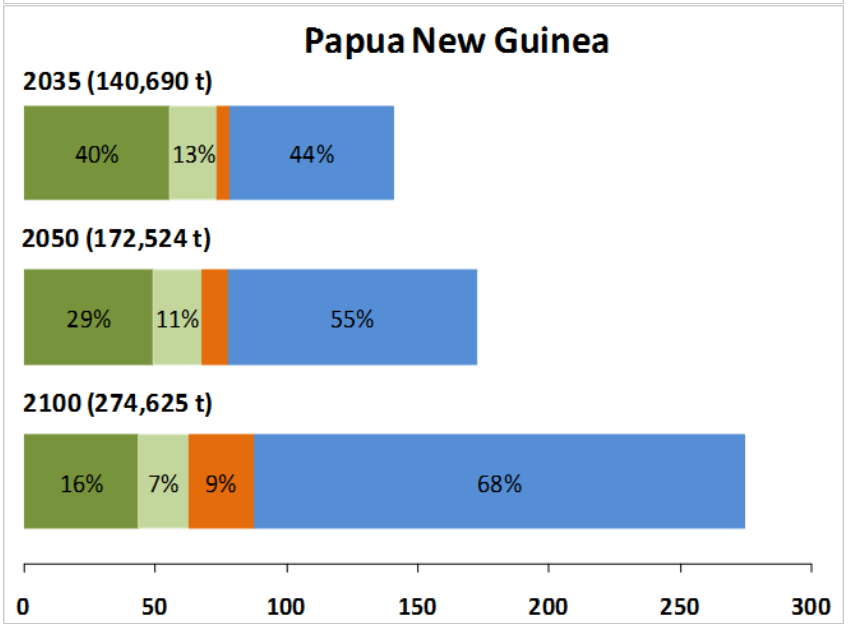


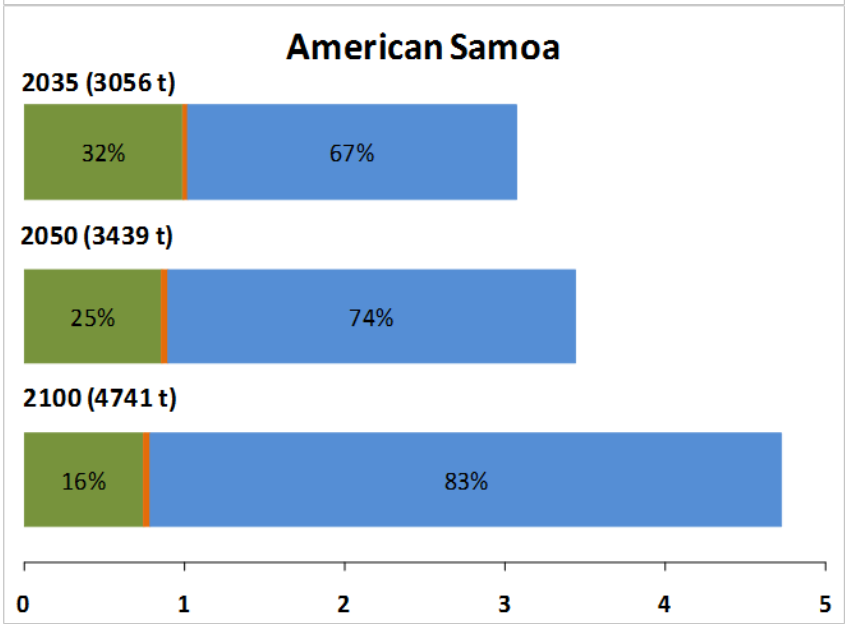
Coastal fisheries | Freshwater fisheries | Pond aquaculture | Tuna (and bycatch)

Source: Bell et al. (2011)



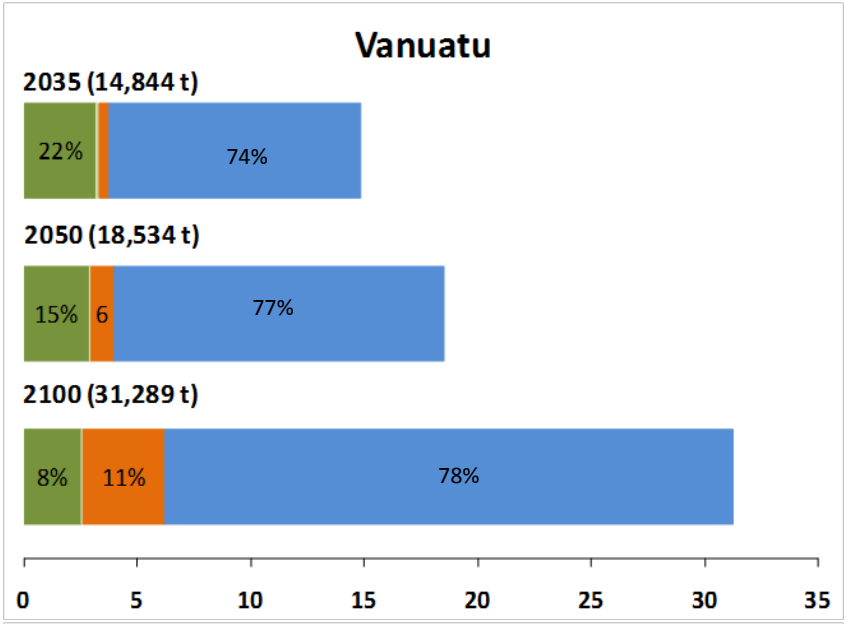


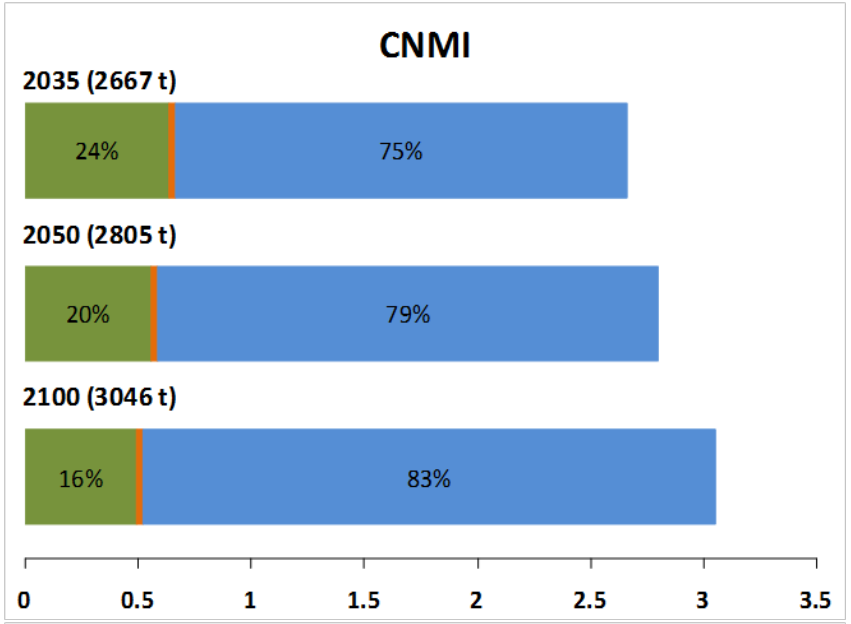


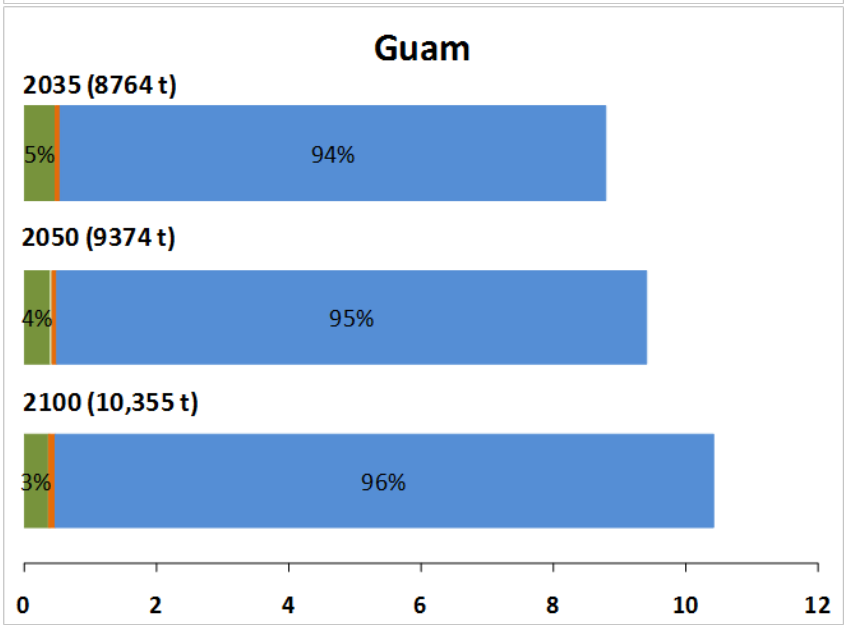


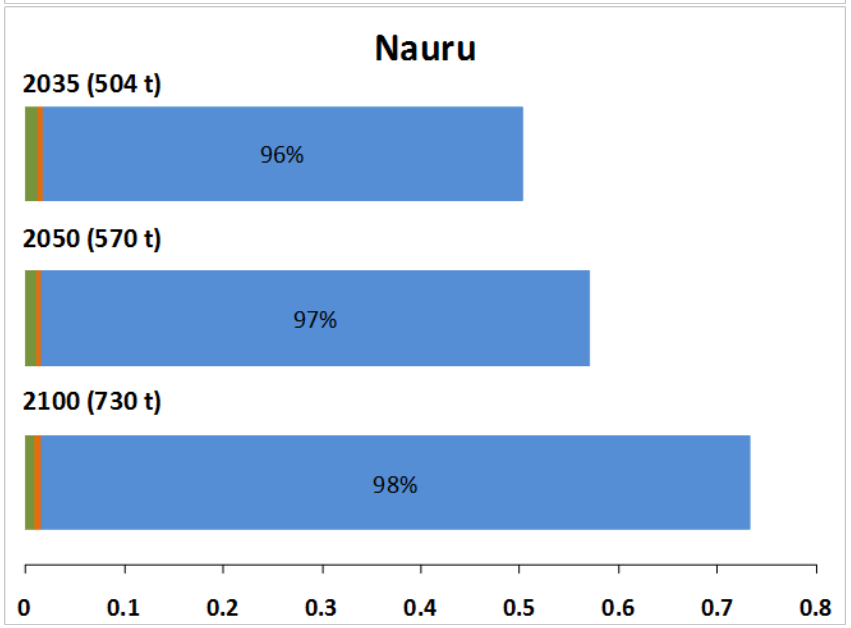
Fish needed (tonnes x 1000)

Fish needed (tonnes x 1000)





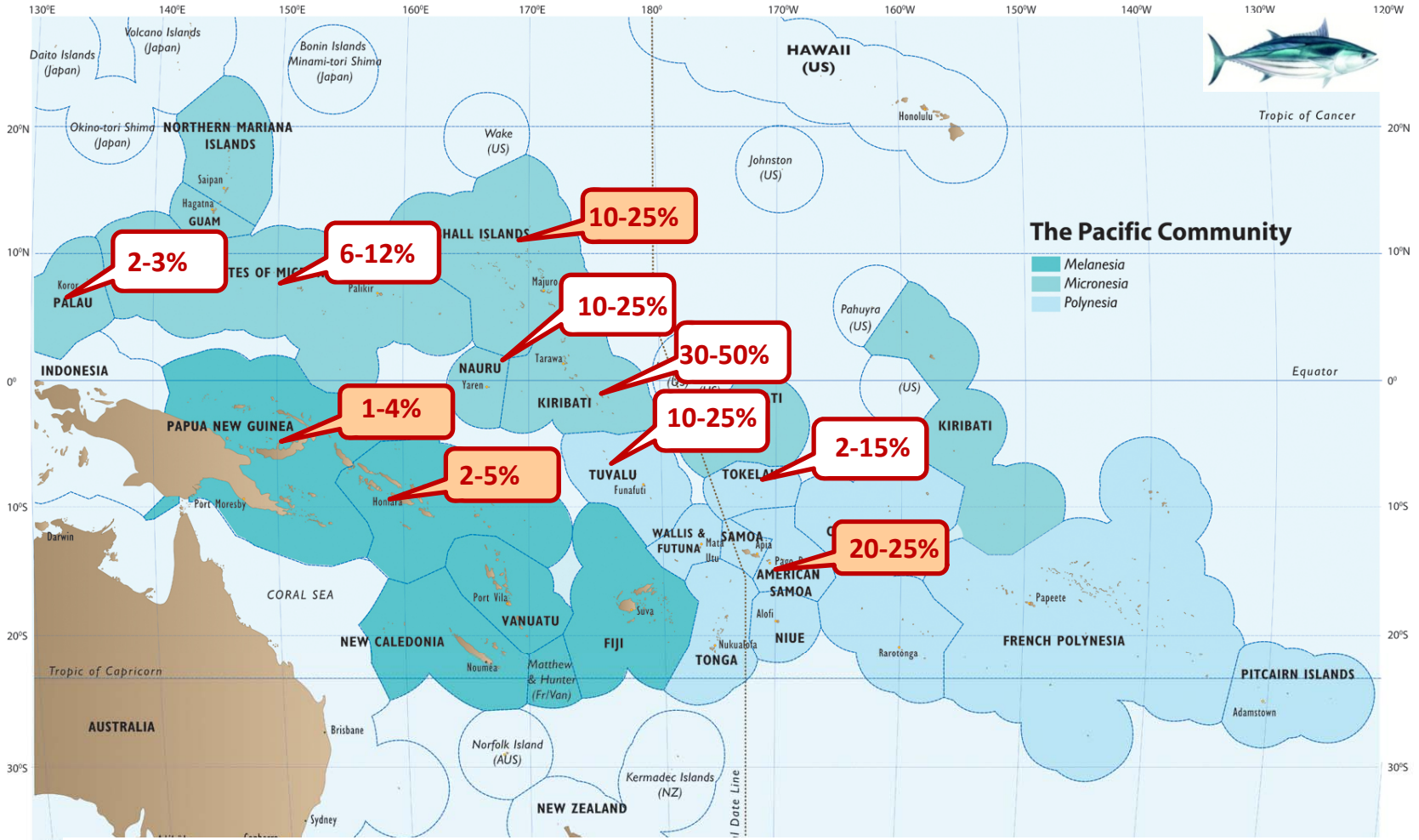




Fish needed (tonnes x 1000)

Fish needed (tonnes x 1000)

Importance of Fisheries to economies



2010 skipjack tuna catch from WCPO
= 1.6 million tonnes

1999-2008

Government revenue

GDP

Source: Bell et al. (2011)

Importance of fisheries to economies

- Small / Medium scale Fisheries
- Commercial fisheries (Coastal / Oceanic)

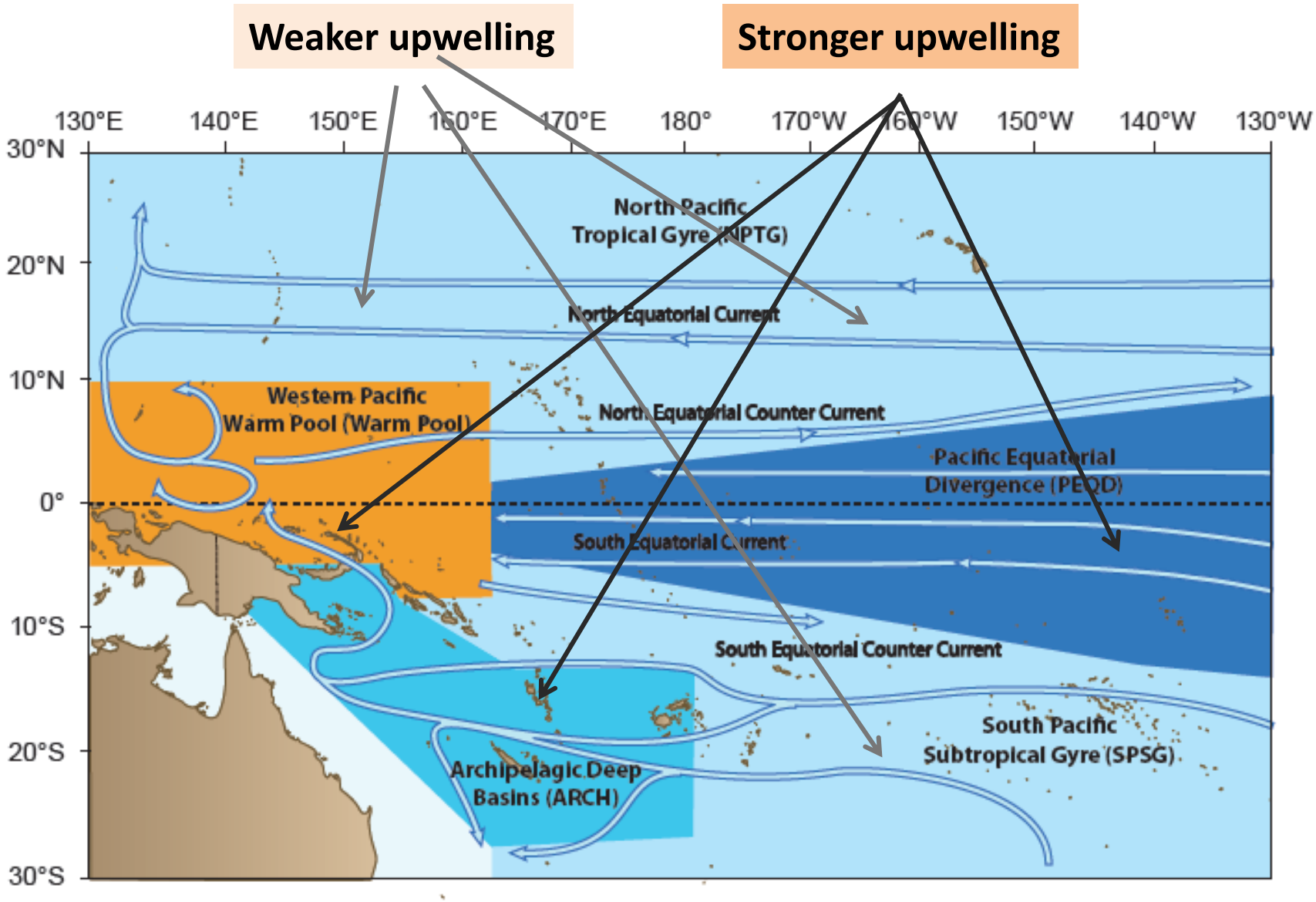
- Fishing Access:
  - Individual country vs Group of countries
  - Domestication vs Foreign Fishing
  - Transparency, Accountability

Fisheries & Economies

- **Positive Impact**
- Food security
- Skills development , Jobs
- Government revenue
- Foreign exchange earnings

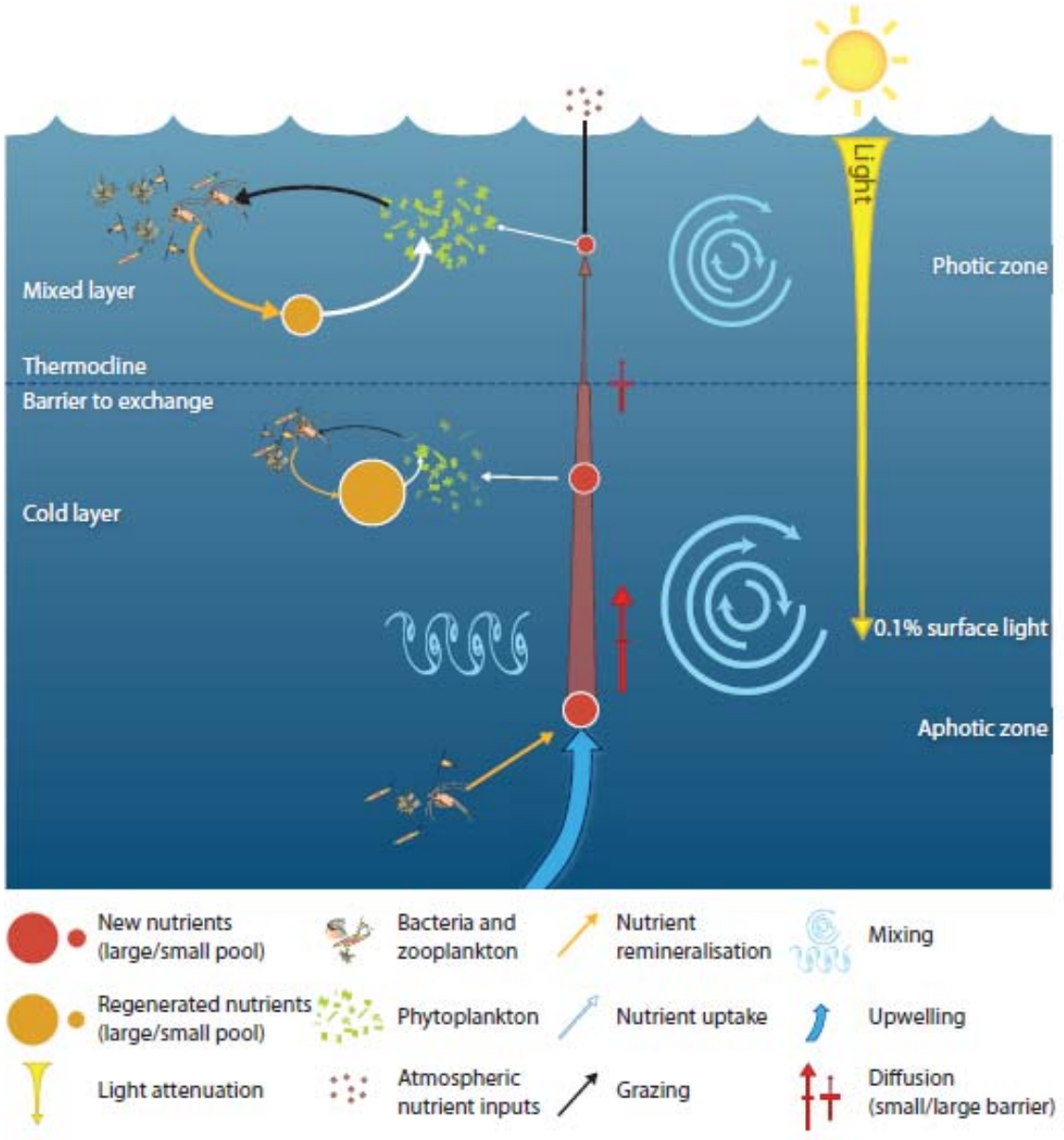
- **Negative Impacts**
- Poor governance leading to concentration of benefits amongst the elite few
- Pacific Islanders acting as fronts for foreign middlemen
- Revenue from the industry transferred offshore (*associated with point above*)
- Degradation of community management systems?

Location of mining is important

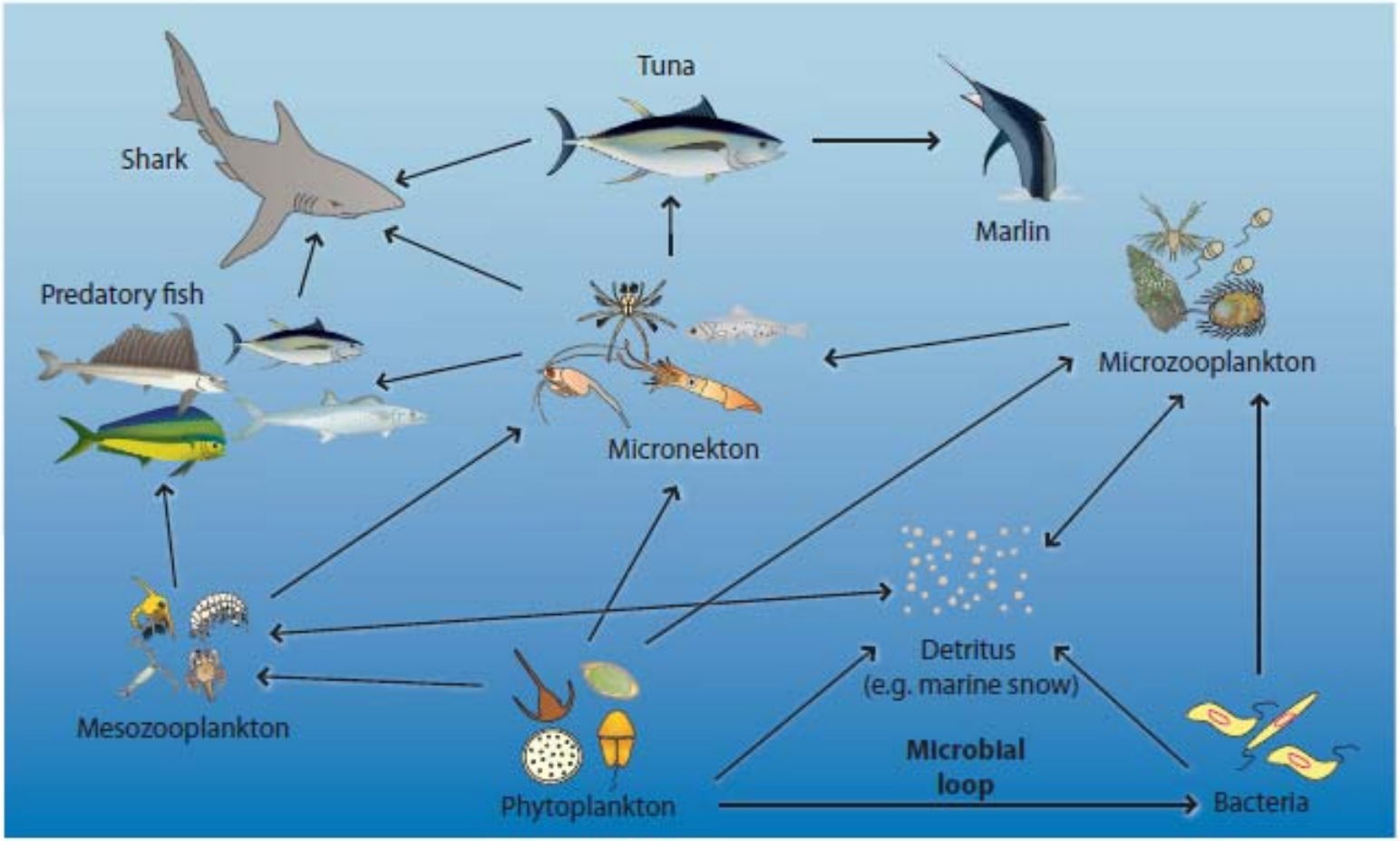


Transport of material/nutrient to surface

Thermocline is barrier to movement of material from deep water to surface

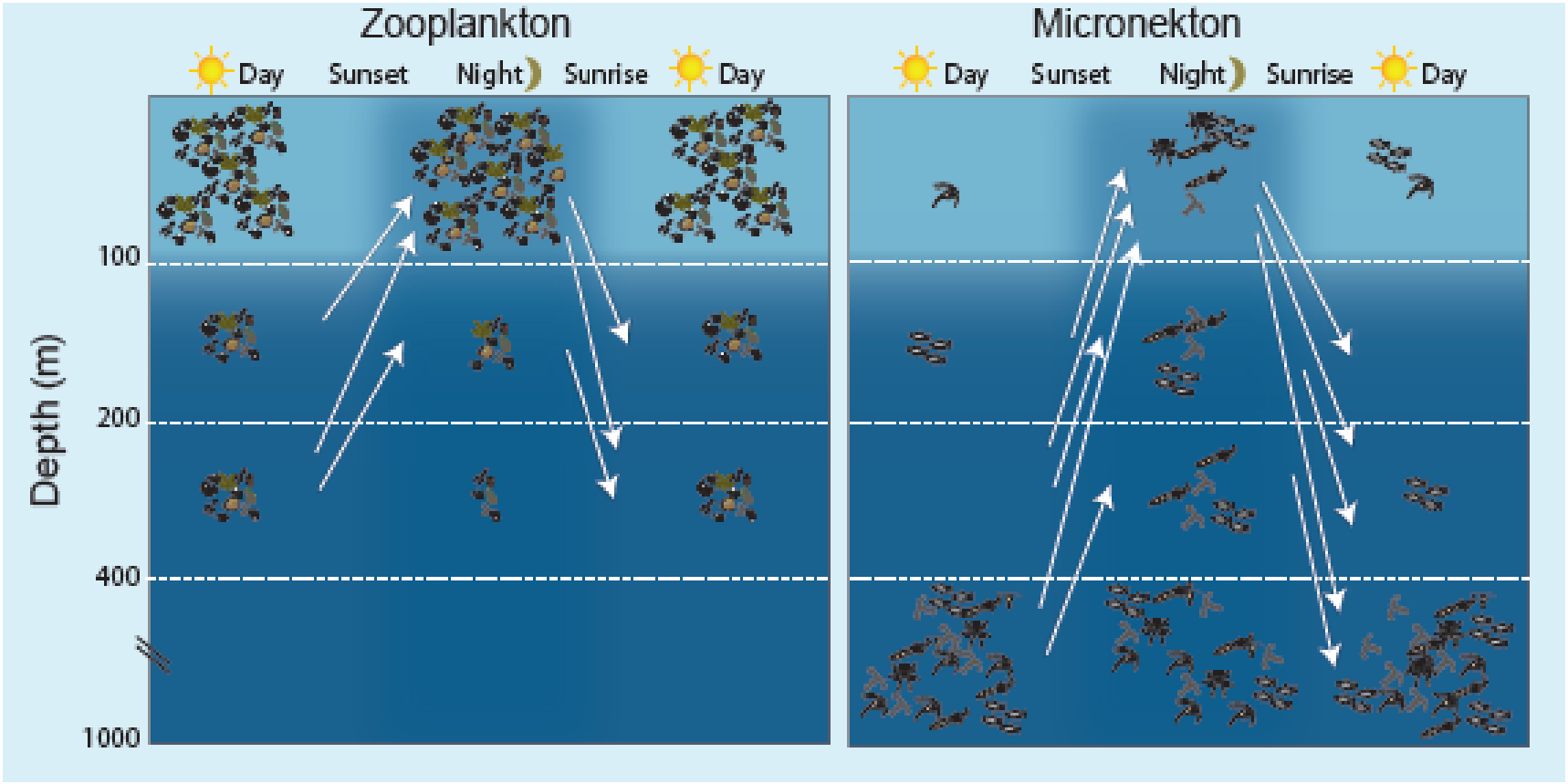


Food webs for tuna

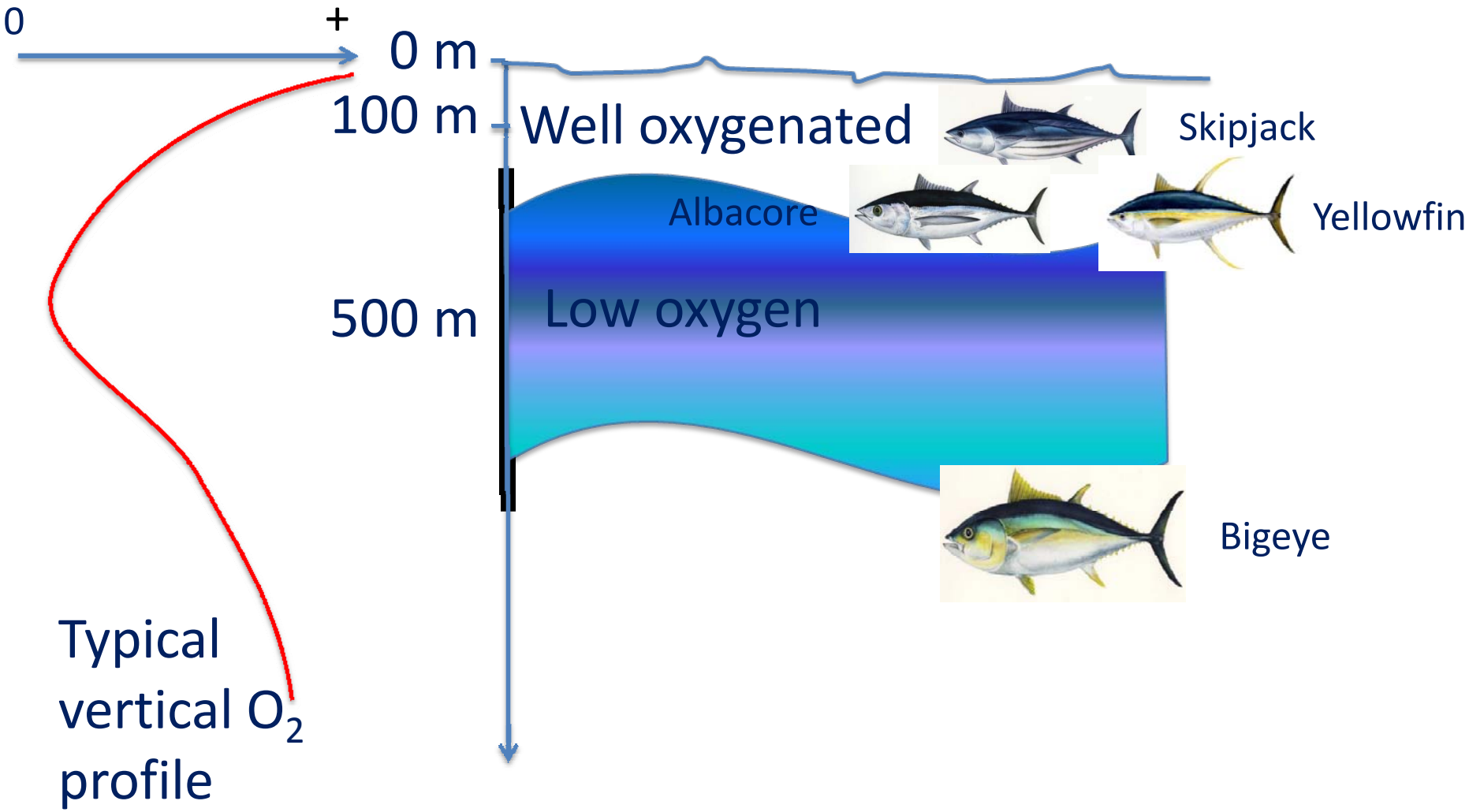


Potential problem

- If mining contaminates zooplankton/micronekton in deep water this could be transported to surface during vertical migration and affect tuna



Tuna habitat with depth



Possible effect of mining (checklist)

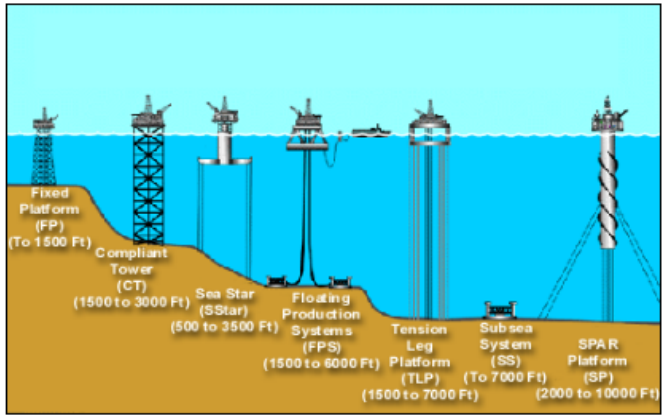
Depends on:

- Depth mining occurs
  - Coastal fisheries <50m on/near reef systems
  - Tuna fisheries –typically shallow surfaces waters, but can extend 300-500m, wider / broad area (near reef to high/seas)
  - Deepwater snappers: 200 - 350m, seamounts
  - Deep-sea (Alfonsino) down to 600 m, but not commercial at this time

Possible effect of mining (checklist)

Depends on:

- Where mining occurs
  - close/far from shore
  - Proximity of mining operations to fishing grounds/important habitats
  - If not “near” islands/reefs (100 km?) then impacts likely to be low (?) currents (?)
  - Accidental, events risks



Possible effect of mining (checklist)

Depends on:

- Type of mining operations
  - Dredging sediments, removing small structures, oil, etc
- ***Potential high impact***: dredging sediments or oil close to shore
- ***Low impact***: removal of small structures from deep water far from shore

Photo: *Nautilus Minerals*

Checklist

- Safeguards proposed by industry
- Evaluate risk to Oceanic, Coastal, Reef Slope Fisheries
- Biodiversity (benthic/plankton) issues
- Noise ??
- Due diligence / Transparency / accountability

Possible benefits

Will a mining operation create a FAD?

Mining platforms as FADs?